

# THE CITY OF DELRAY BEACH

## CITY OF DELRAY BEACH PROJECT NO. 19-012

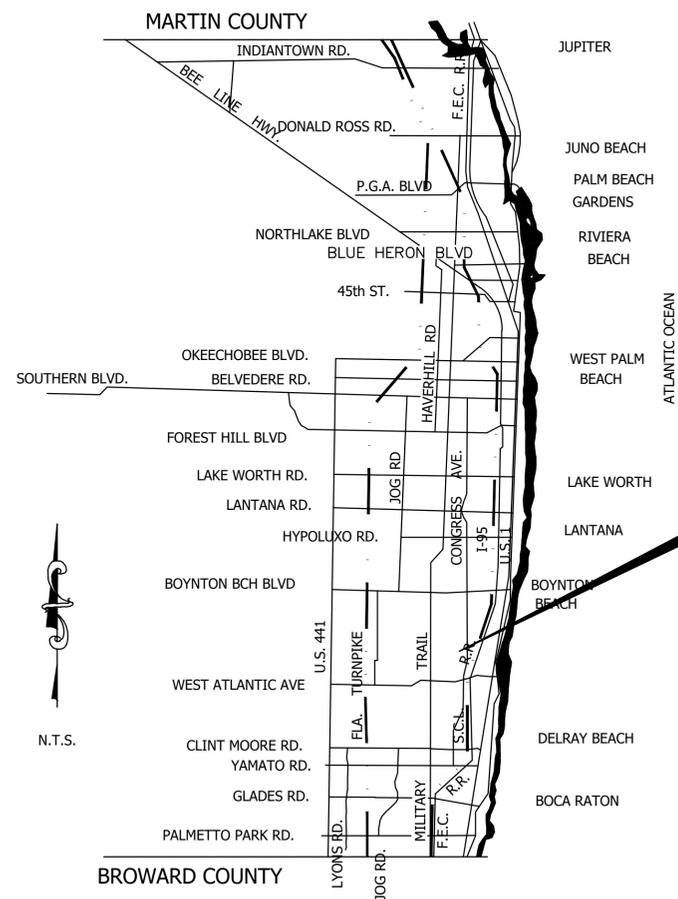
### N. SWINTON AVE ROADWAY & UNDERGROUND UTILITY IMPROVEMENTS

# 100% PLANS

3/27/2024

#### CITY OFFICIALS

MAYOR	SHELLY PETROLIA
VICE MAYOR	RYAN BOLSTON
DEPUTY VICE MAYOR	ROB LONG
COMMISSIONER	ADAM FRANKEL
COMMISSIONER	ANGELA BURNS
CITY MANAGER	TERRENCE MOORE

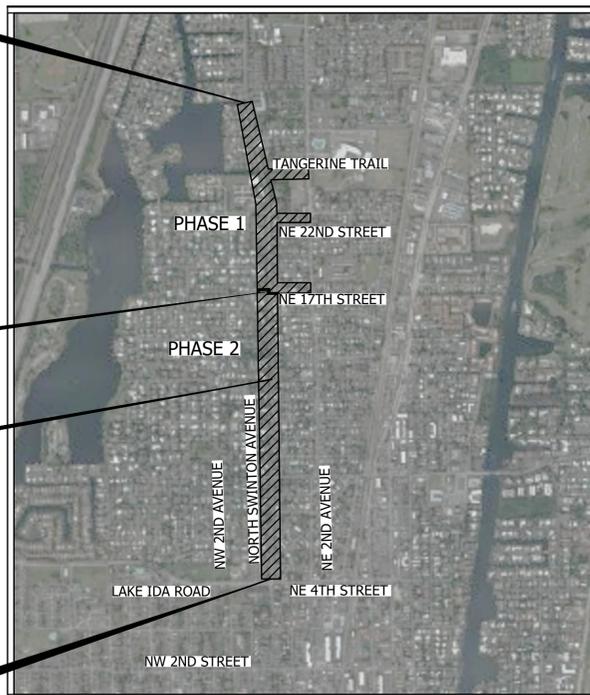


END PROJECT  
STA. 259+65.6

PHASE LIMITS  
STA. 228+88.94

PROJECT

BEGIN PROJECT  
STA. 181+50.00



#### LOCATION MAP

NO SCALE  
PROJECT LOCATED IN:  
SECTION 4, 5, 8, 9; TOWNSHIP 46 SOUTH; RANGE 43 EAST

#### SHEET LIST

SET NUMBER	SHEET NUMBER	SHEET TITLE
1	C001	COVER SHEET
2	C002	GENERAL NOTES
3	C003	KEY SHEET
4	C004	HORIZONTAL ALIGNMENT PLAN
5 - 8	C005 - C008	TYPICAL SECTIONS
9 - 26	CD100 - CD117	DEMOLITION PLAN
28 - 45	CG100 - CG117	ROADWAY PLAN AND PROFILE
47 - 66	CS100 - CS119	CROSS SECTIONS
67 - 84	CR100 - CR117	SIGNING AND MARKING PLAN
86 - 103	CU100 - CU117	UTILITY PLAN
104 - 106	SD001-SD003	DRAINAGE BASIN PLAN
107 - 113	SD004-SD010	STORM DESIGN PLAN
116 - 125B	C600 - C611	CITY OF DELRAY BEACH DETAILS
126 - 191C	CT100-CT165C	MOT PLANS
192 - 199	TI101-TI108	TREE INVENTORY PLAN
200	LP-100	LANDSCAPE KEY PLAN
201 - 218	LP-101 - LP-118	LANDSCAPE PLAN
219	LP-200	LANDSCAPE SCHEDULE
220 - 221	LP-500 - LP-501	LANDSCAPE NOTES
222	IP-101	IRRIGATION PLAN
223	IP-500	IRRIGATION NOTES/DETAILS

NOTES: SHEETS 27 (CD118), 46 (CG118), 85 (CR118), 114 (AD100), AND 115 (AD101) HAVE BEEN REMOVED FROM THE PLAN SET AS THEY ARE NO LONGER IN THE SCOPE OF THE PROJECT.

#### ATTACHED TOPOGRAPHIC SURVEY

SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2-14	TOPOGRAPHIC SURVEY

PREPARED FOR:  
CITY OF DELRAY BEACH  
434 S. SWINTON AVE  
DELRAY BEACH, FL 33444  
561.243.7000

ENGINEER OF RECORD  
STEPHEN CHERRY, PE  
PE# 83268

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
WGI NO.: 5567.00

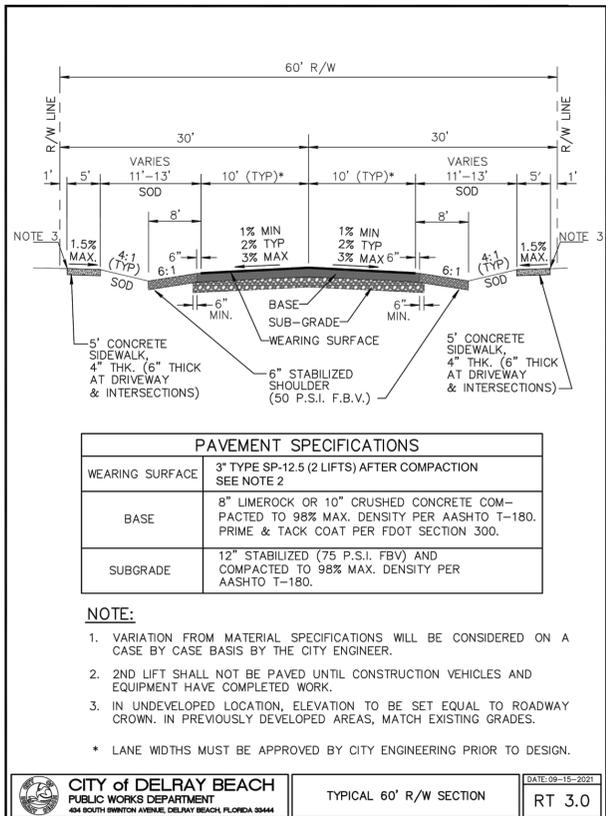
VERTICAL DATUM: NORTH AMERICAN  
VERTICAL DATUM OF 1988 (NAVD88)  
  
HORIZONTAL DATUM: NORTH AMERICAN  
DATUM OF 1983, FLORIDA STATE PLANES,  
EAST ZONE, U.S. FEET (NAD83)

PREPARED BY:



2035 Vista Parkway  
West Palm Beach, FL 33411  
Phone No. 561.687.2220  
Fax No. 561.687.1110  
Cert No. 6091 - LB No. 7055





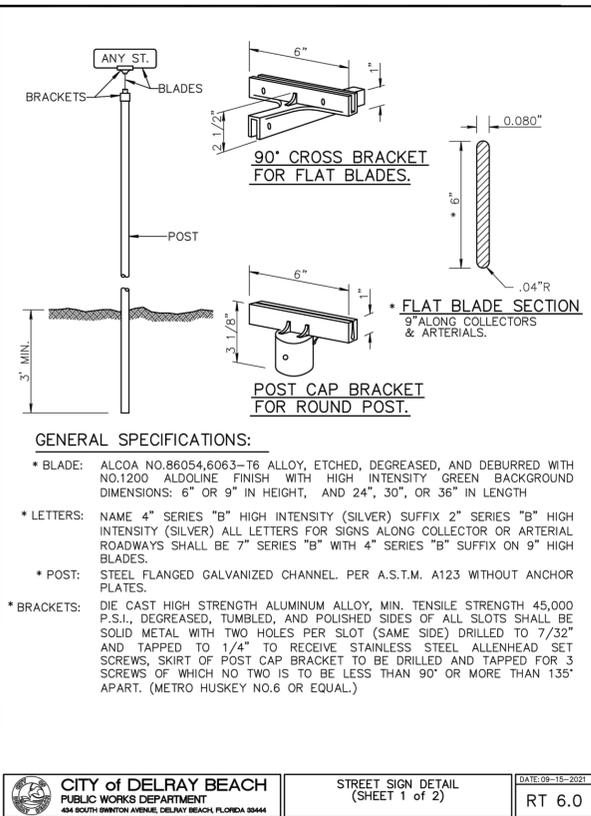
PAVEMENT SPECIFICATIONS	
WEARING SURFACE	3" TYPE SP-12.5 (2 LIFTS) AFTER COMPACTION SEE NOTE 2
BASE	8" LIMEROCK OR 10" CRUSHED CONCRETE COMPACTED TO 98% MAX. DENSITY PER AASHTO T-180. PRIME & TACK COAT PER FDOT SECTION 300.
SUBGRADE	12" STABILIZED (75 P.S.I. FBV) AND COMPACTED TO 98% MAX. DENSITY PER AASHTO T-180.

- NOTE:**
- VARIATION FROM MATERIAL SPECIFICATIONS WILL BE CONSIDERED ON A CASE BY CASE BASIS BY THE CITY ENGINEER.
  - 2ND LIFT SHALL NOT BE PAVED UNTIL CONSTRUCTION VEHICLES AND EQUIPMENT HAVE COMPLETED WORK.
  - IN UNDEVELOPED LOCATION, ELEVATION TO BE SET EQUAL TO ROADWAY CROWN. IN PREVIOUSLY DEVELOPED AREAS, MATCH EXISTING GRADES.
- \* LANE WIDTHS MUST BE APPROVED BY CITY ENGINEERING PRIOR TO DESIGN.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL 60' R/W SECTION

DATE: 09-15-2021  
RT 3.0

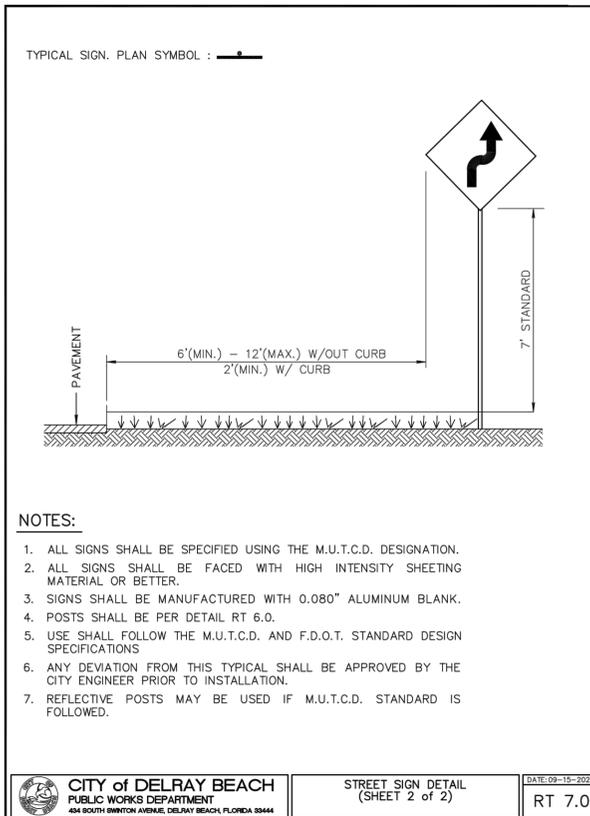


- GENERAL SPECIFICATIONS:**
- BLADE:** ALCOA NO.86054.6063-T6 ALLOY, ETCHED, DEGREASED, AND DEBURRED WITH NO.1200 ALDOLINE FINISH WITH HIGH INTENSITY GREEN BACKGROUND DIMENSIONS: 6" OR 9" IN HEIGHT, AND 24", 30", OR 36" IN LENGTH
  - LETTERS:** NAME 4" SERIES "B" HIGH INTENSITY (SILVER) SUFFIX 2" SERIES "B" HIGH INTENSITY (SILVER) ALL LETTERS FOR SIGNS ALONG COLLECTOR OR ARTERIAL ROADWAYS SHALL BE 7" SERIES "B" WITH 4" SERIES "B" SUFFIX ON 9" HIGH BLADES.
  - POST:** STEEL FLANGED GALVANIZED CHANNEL. PER A.S.T.M. A123 WITHOUT ANCHOR PLATES.
  - BRACKETS:** DIE CAST HIGH STRENGTH ALUMINUM ALLOY, MIN. TENSILE STRENGTH 45,000 P.S.I., DEGREASED, TUMBLED, AND POLISHED SIDES OF ALL SLOTS SHALL BE SOLID METAL WITH TWO HOLES PER SLOT (SAME SIDE) DRILLED TO 7/32" AND TAPPED TO 1/4" TO RECEIVE STAINLESS STEEL ALLENHEAD SET SCREWS. SKIRT OF POST CAP BRACKET TO BE DRILLED AND TAPPED FOR 3 SCREWS OF WHICH NO TWO IS TO BE LESS THAN 90° OR MORE THAN 135° APART. (METRO HUSKEY NO.6 OR EQUAL.)

CITY of DELRAY BEACH  
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STREET SIGN DETAIL  
(SHEET 1 of 2)

DATE: 09-15-2021  
RT 6.0

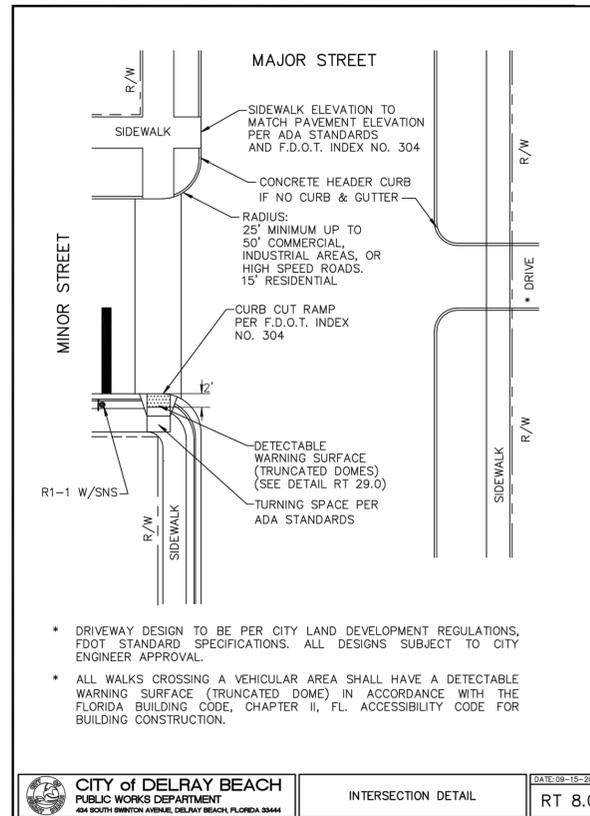


- NOTES:**
- ALL SIGNS SHALL BE SPECIFIED USING THE M.U.T.C.D. DESIGNATION.
  - ALL SIGNS SHALL BE FACED WITH HIGH INTENSITY SHEETING MATERIAL OR BETTER.
  - SIGNS SHALL BE MANUFACTURED WITH 0.080" ALUMINUM BLANK.
  - POSTS SHALL BE PER DETAIL RT 6.0.
  - USE SHALL FOLLOW THE M.U.T.C.D. AND F.D.O.T. STANDARD DESIGN SPECIFICATIONS
  - ANY DEVIATION FROM THIS TYPICAL SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
  - REFLECTIVE POSTS MAY BE USED IF M.U.T.C.D. STANDARD IS FOLLOWED.

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STREET SIGN DETAIL  
(SHEET 2 of 2)

DATE: 09-15-2021  
RT 7.0

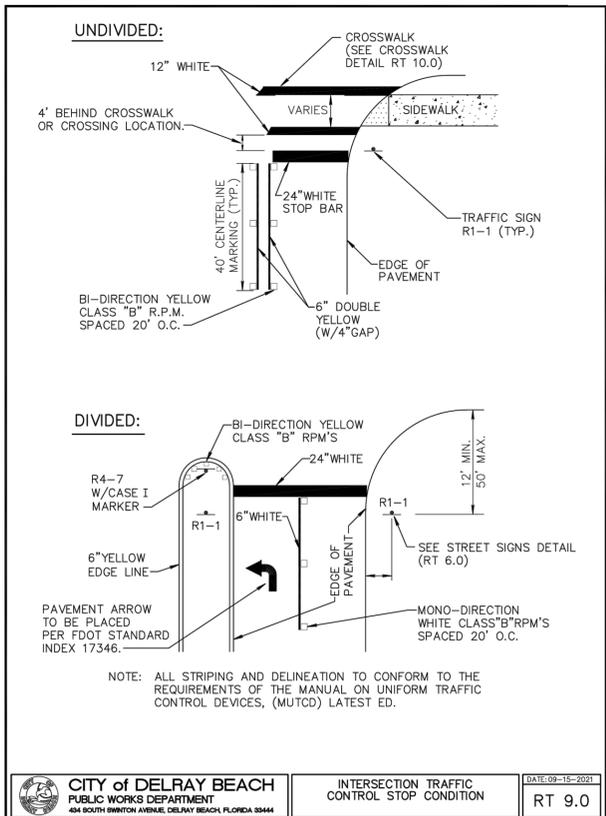


- \* DRIVEWAY DESIGN TO BE PER CITY LAND DEVELOPMENT REGULATIONS, FOOT STANDARD SPECIFICATIONS. ALL DESIGNS SUBJECT TO CITY ENGINEER APPROVAL.
- \* ALL WALKS CROSSING A VEHICULAR AREA SHALL HAVE A DETECTABLE WARNING SURFACE (TRUNCATED DOME) IN ACCORDANCE WITH THE FLORIDA BUILDING CODE, CHAPTER II, FL. ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION.

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INTERSECTION DETAIL

DATE: 09-15-2021  
RT 8.0

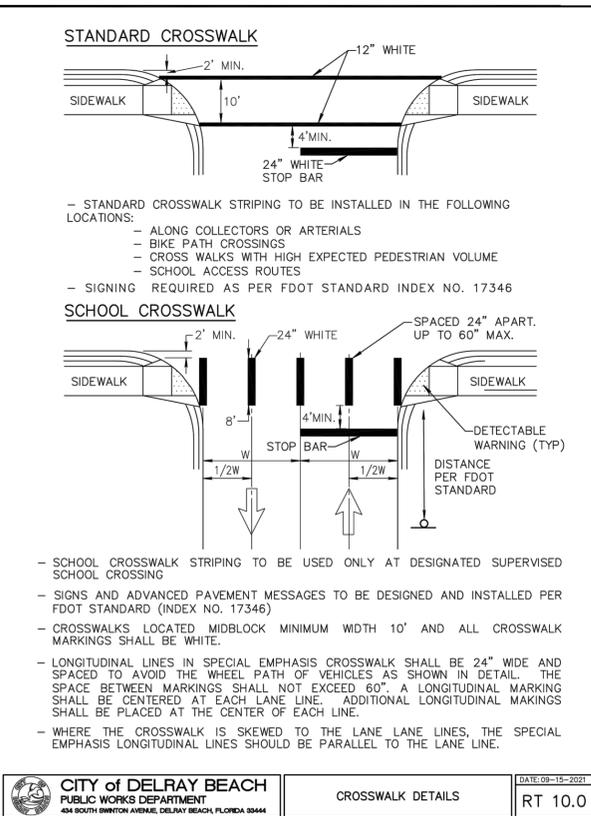


**NOTE:** ALL STRIPING AND DELINEATION TO CONFORM TO THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST ED.

CITY of DELRAY BEACH  
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INTERSECTION TRAFFIC CONTROL STOP CONDITION

DATE: 09-15-2021  
RT 9.0



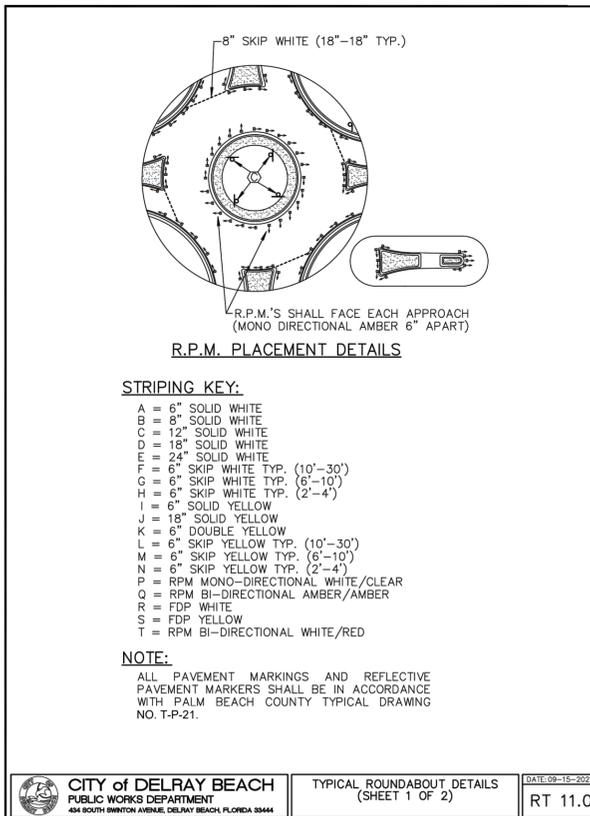
- STANDARD CROSSWALK STRIPING TO BE INSTALLED IN THE FOLLOWING LOCATIONS:
- ALONG COLLECTORS OR ARTERIALS
  - BIKE PATH CROSSINGS
  - CROSS WALKS WITH HIGH EXPECTED PEDESTRIAN VOLUME
  - SCHOOL ACCESS ROUTES
- SIGNING REQUIRED AS PER FDOT STANDARD INDEX NO. 17346

- SCHOOL CROSSWALK STRIPING TO BE USED ONLY AT DESIGNATED SUPERVISED SCHOOL CROSSING
- SIGNS AND ADVANCED PAVEMENT MESSAGES TO BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346)
  - CROSSWALKS LOCATED MIDBLOCK MINIMUM WIDTH 10' AND ALL CROSSWALK MARKINGS SHALL BE WHITE.
  - LONGITUDINAL LINES IN SPECIAL EMPHASIS CROSSWALK SHALL BE 24" WIDE AND SPACED TO AVOID THE WHEEL PATH OF VEHICLES AS SHOWN IN DETAIL. THE SPACE BETWEEN MARKINGS SHALL NOT EXCEED 60". A LONGITUDINAL MARKING SHALL BE CENTERED AT EACH LANE LINE. ADDITIONAL LONGITUDINAL MARKINGS SHALL BE PLACED AT THE CENTER OF EACH LANE.
  - WHERE THE CROSSWALK IS SKEWED TO THE LANE LANE LINES, THE SPECIAL EMPHASIS LONGITUDINAL LINES SHOULD BE PARALLEL TO THE LANE LINE.

CITY of DELRAY BEACH  
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CROSSWALK DETAILS

DATE: 09-15-2021  
RT 10.0



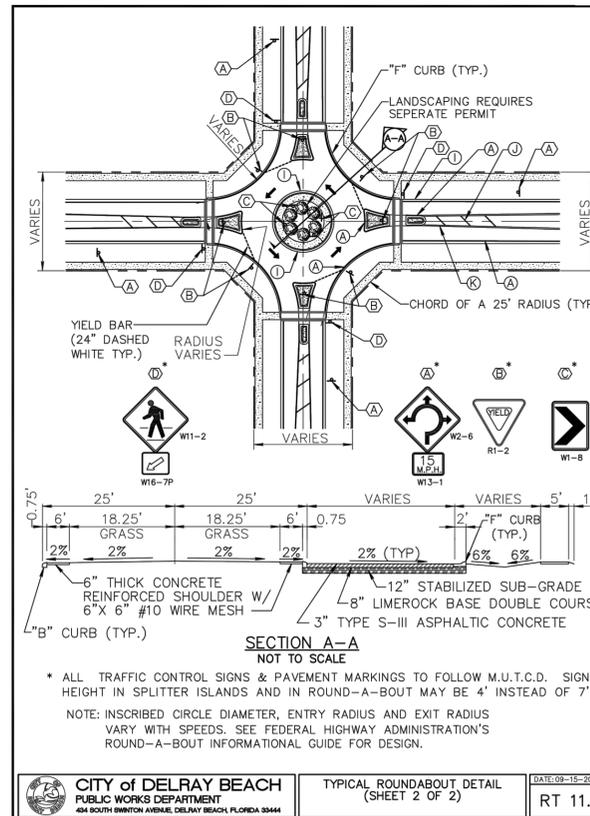
- STRIPING KEY:**
- A = 6" SOLID WHITE
  - B = 8" SOLID WHITE
  - C = 12" SOLID WHITE
  - D = 18" SOLID WHITE
  - E = 24" SOLID WHITE
  - F = 6" SKIP WHITE TYP. (10'-30')
  - G = 6" SKIP WHITE TYP. (6'-10')
  - H = 6" SKIP WHITE TYP. (2'-4')
  - I = 6" SOLID YELLOW
  - J = 18" SOLID YELLOW
  - K = 6" DOUBLE YELLOW
  - L = 6" SKIP YELLOW TYP. (10'-30')
  - M = 6" SKIP YELLOW TYP. (6'-10')
  - N = 6" SKIP YELLOW TYP. (2'-4')
  - P = RPM MONO-DIRECTIONAL WHITE/CLEAR
  - Q = RPM BI-DIRECTIONAL AMBER/AMBER
  - R = FDP WHITE
  - S = FDP YELLOW
  - T = RPM BI-DIRECTIONAL WHITE/RED

**NOTE:** ALL PAVEMENT MARKINGS AND REFLECTIVE PAVEMENT MARKERS SHALL BE IN ACCORDANCE WITH PALM BEACH COUNTY TYPICAL DRAWING NO. T-P-21.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
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TYPICAL ROUNDABOUT DETAILS  
(SHEET 1 of 2)

DATE: 09-15-2021  
RT 11.0



- \* ALL TRAFFIC CONTROL SIGNS & PAVEMENT MARKINGS TO FOLLOW M.U.T.C.D. SIGN HEIGHT IN SPLITTER ISLANDS AND IN ROUND-A-BOUNT MAY BE 4' INSTEAD OF 7'
- NOTE: INSCRIBED CIRCLE DIAMETER, ENTRY RADIUS AND EXIT RADIUS VARY WITH SPEEDS. SEE FEDERAL HIGHWAY ADMINISTRATION'S ROUND-A-BOUNT INFORMATIONAL GUIDE FOR DESIGN.

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TYPICAL ROUNDABOUT DETAIL  
(SHEET 2 of 2)

DATE: 09-15-2021  
RT 11.1

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
Phone: (561) 246-7822 Fax: (561) 246-7060 www.delraybeach.com

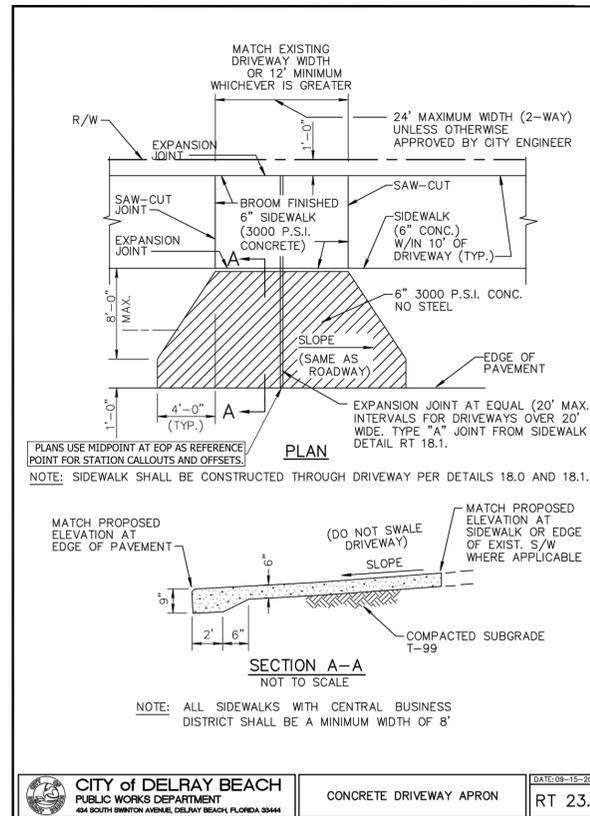
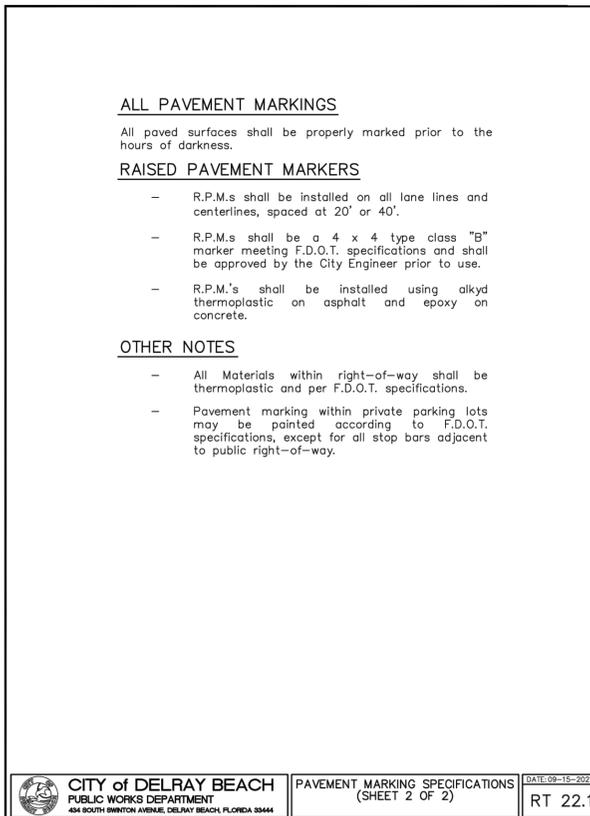
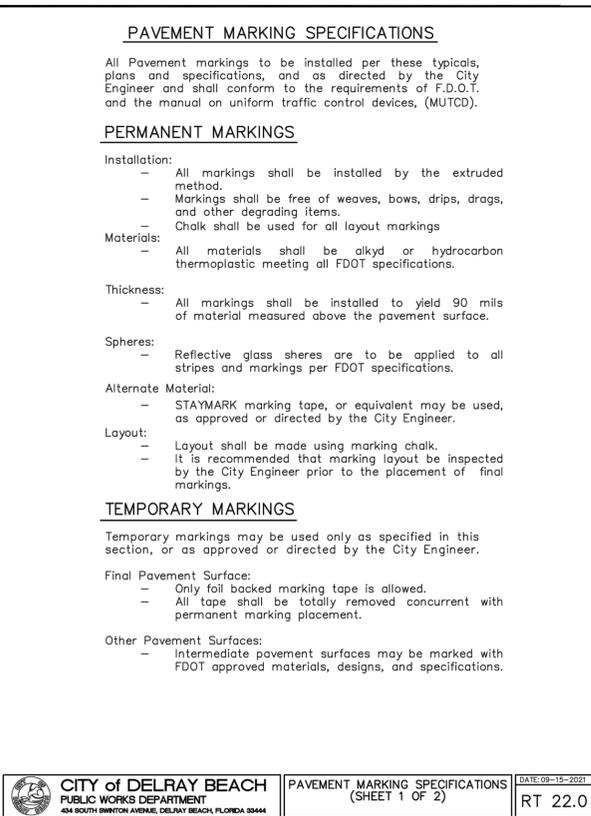
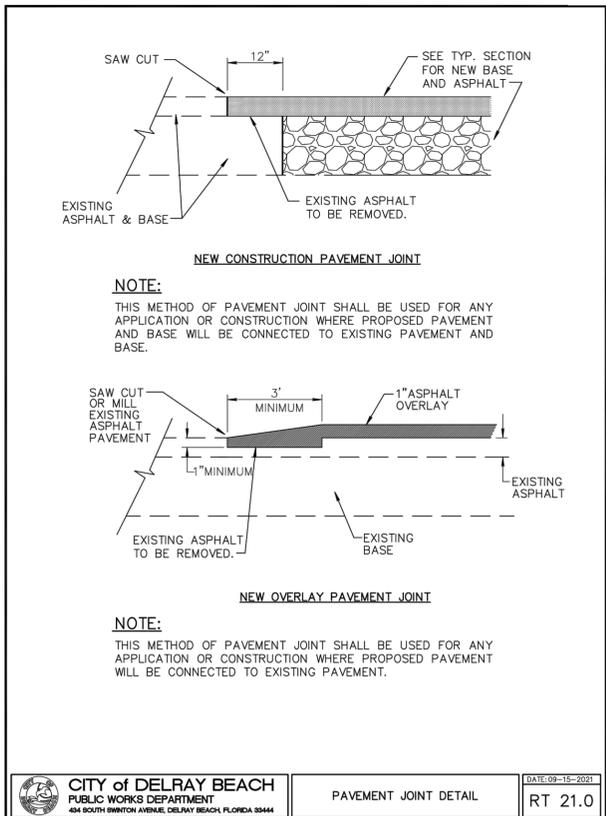
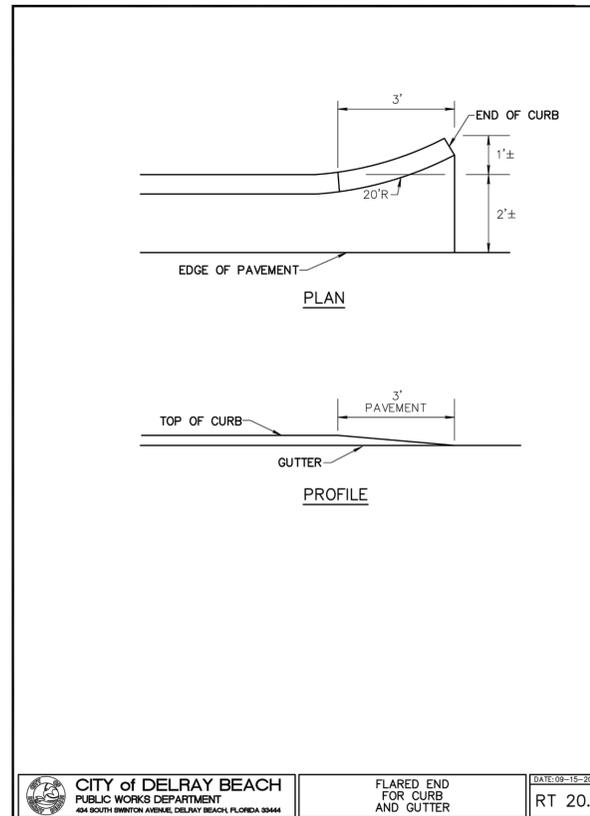
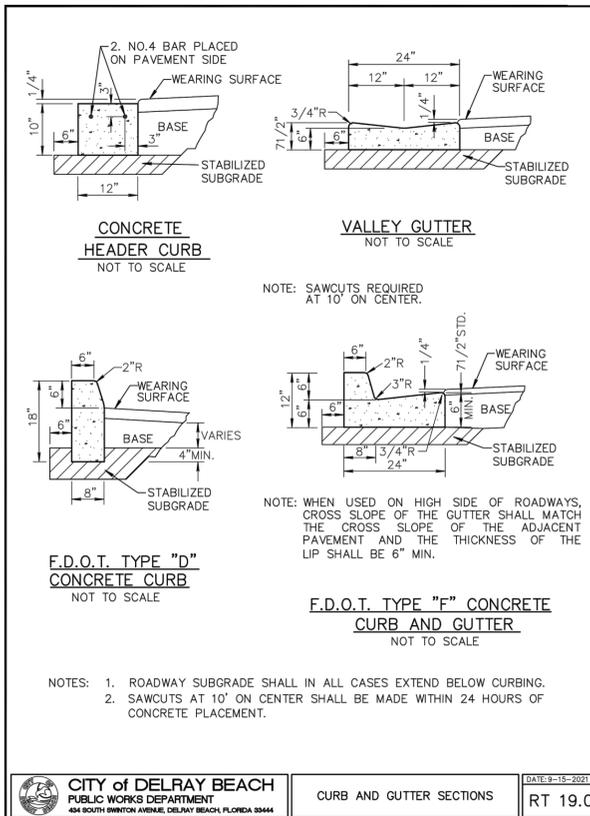
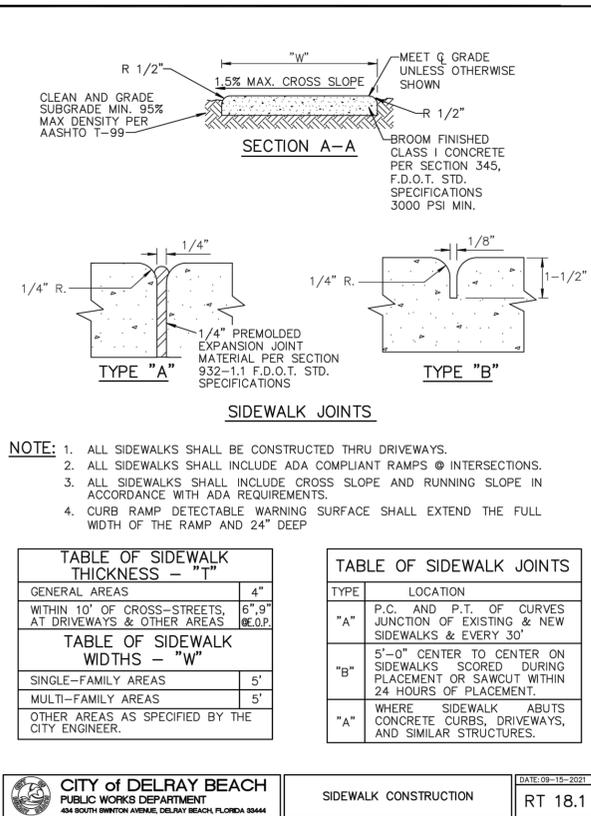
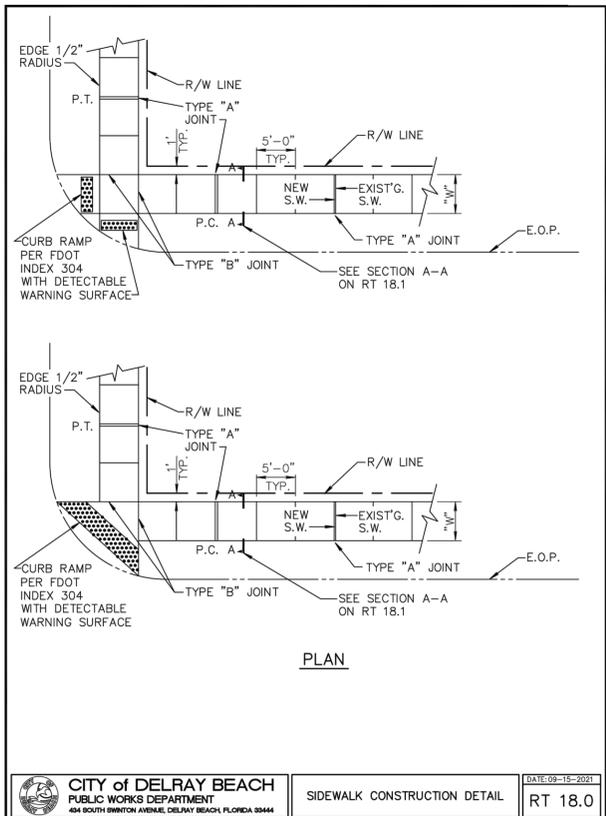


ENGINEER'S SEAL  
STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA  
CITY OF DELRAY BEACH DETAILS



SHEET  
C600  
116 OF 223  
5567.00



**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
Phone: (561) 249-7822 Fax: (561) 249-7080 www.delraybeach.com



**ENGINEER'S SEAL**

STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

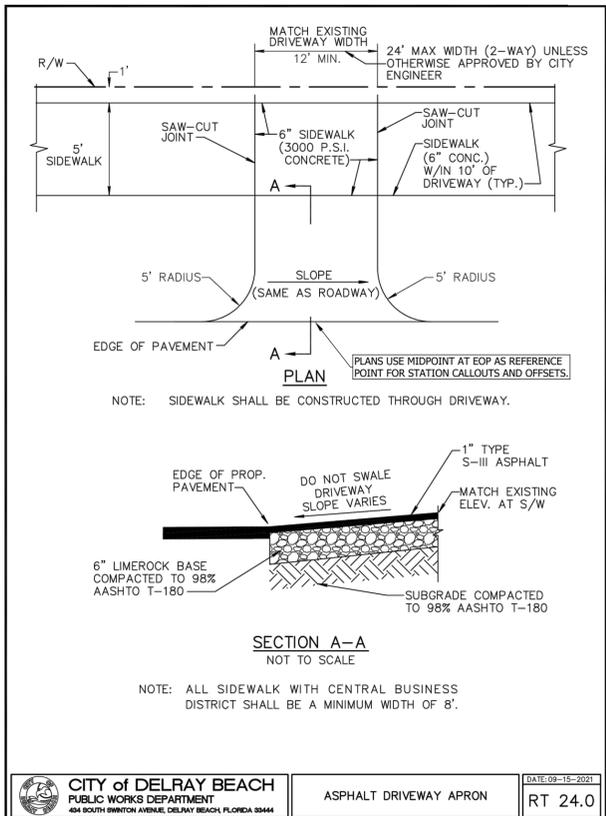
**N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS**  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA

**CITY OF DELRAY BEACH DETAILS**



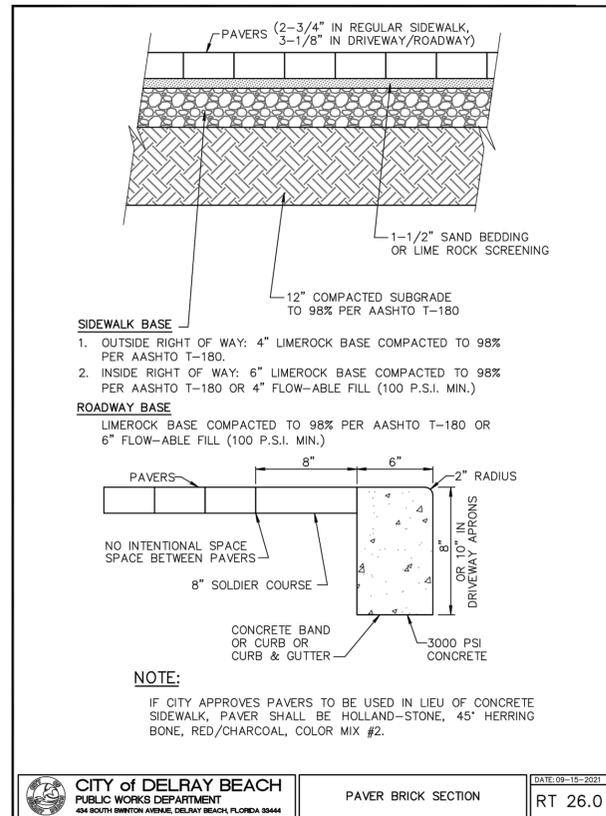
SHEET  
**C601**  
117 OF 223  
5567.00

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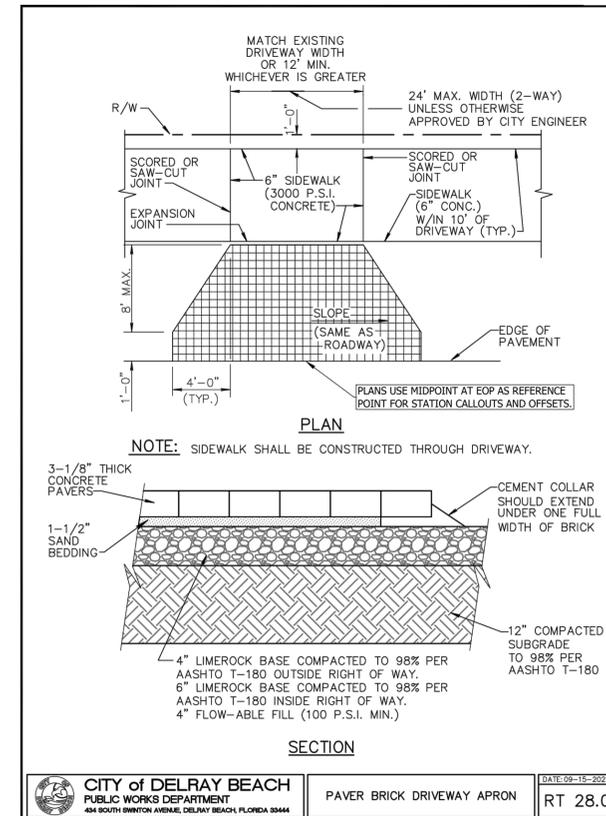
**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

ASPHALT DRIVEWAY APRON  
DATE: 09-15-2021  
RT 24.0



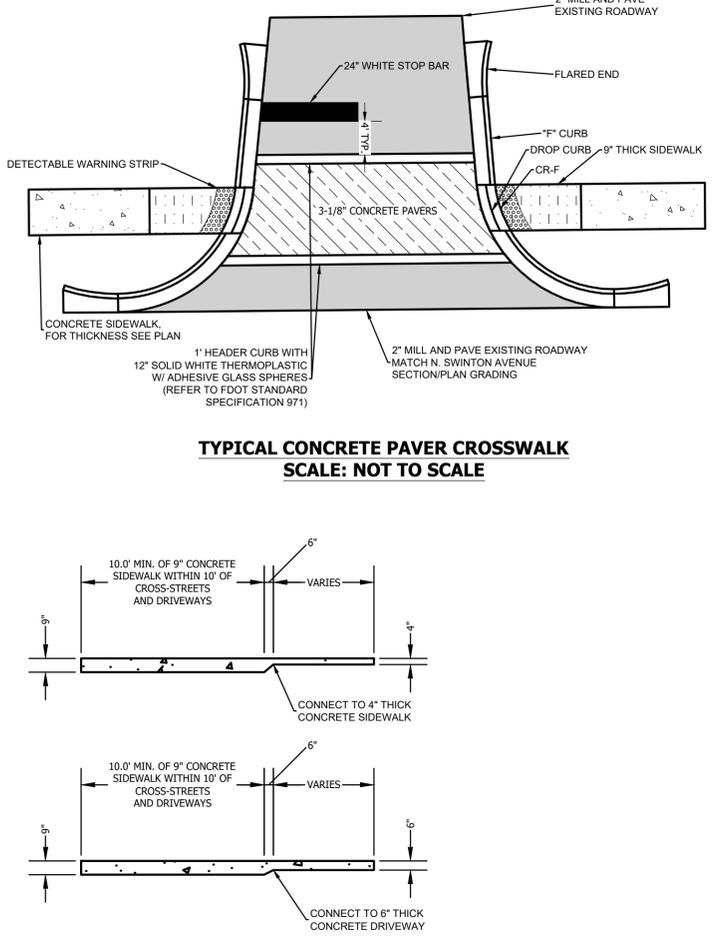
**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PAVER BRICK SECTION  
DATE: 09-15-2021  
RT 26.0



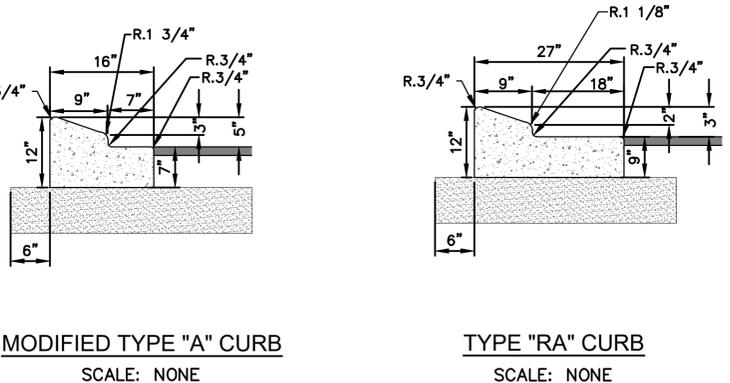
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PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PAVER BRICK DRIVEWAY APRON  
DATE: 09-15-2021  
RT 28.0



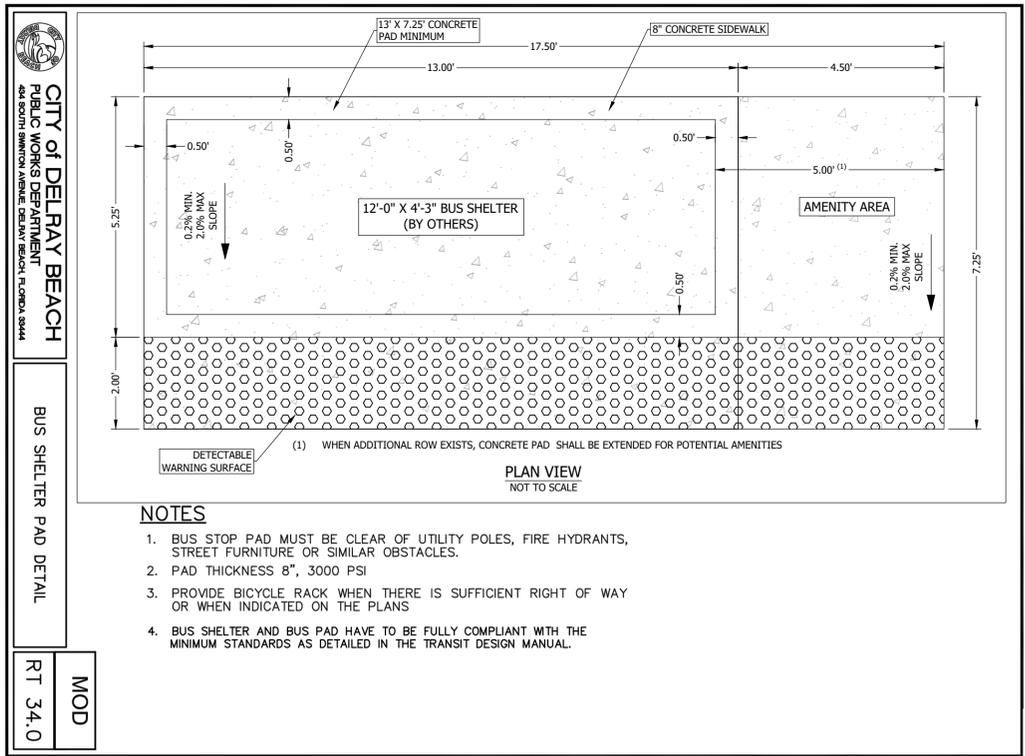
**TYPICAL CONCRETE PAVER CROSSWALK**  
SCALE: NOT TO SCALE

**SIDEWALK AT CURB RAMP DETAIL**  
SCALE: NOT TO SCALE



**MODIFIED TYPE "A" CURB**  
SCALE: NONE

**TYPE "RA" CURB**  
SCALE: NONE



**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

BUS SHELTER PAD DETAIL  
DATE: 09-15-2021  
RT 34.0

- NOTES**
- BUS STOP PAD MUST BE CLEAR OF UTILITY POLES, FIRE HYDRANTS, STREET FURNITURE OR SIMILAR OBSTACLES.
  - PAD THICKNESS 8", 3000 PSI
  - PROVIDE BICYCLE RACK WHEN THERE IS SUFFICIENT RIGHT OF WAY OR WHEN INDICATED ON THE PLANS
  - BUS SHELTER AND BUS PAD HAVE TO BE FULLY COMPLIANT WITH THE MINIMUM STANDARDS AS DETAILED IN THE TRANSIT DESIGN MANUAL.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
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Phone: (561) 245-7822 Fax: (561) 245-7060 www.delraybeach.com

CERT. NO. 6991

**WGI**  
WGInc.com

561.687.2220

2035 VISTA PARKWAY, WEST PALM BEACH, FLORIDA 33411

ENGINEER'S SEAL

STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA

CITY OF DELRAY BEACH DETAILS

SHEET  
**C602**  
118 OF 223  
5567.00



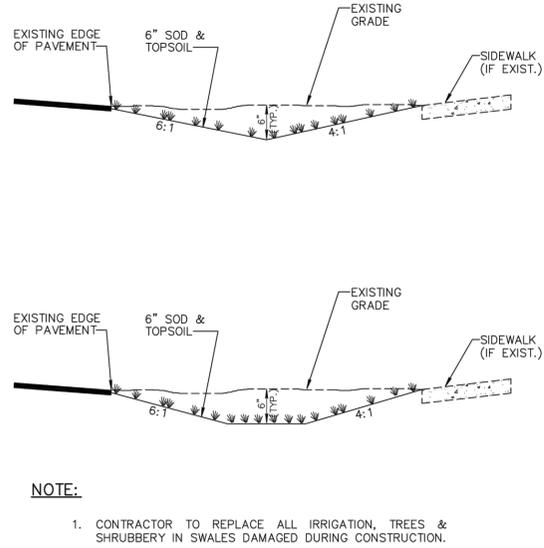
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 PLOT DATE: 12/21/2023 5:50 AM  
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1. THE INTENT OF EROSION CONTROL MEASURES INDICATED GRAPHICALLY ON PLANS IS TO PROVIDE A BARRIER TO CONTAIN SILT AND SEDIMENT ON THE PROJECT SITE. THIS REPRESENTATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE TEST OF EROSION CONTROL EFFECTIVENESS IS NOT TO BE DETERMINED BY ADHERENCE TO THE REPRESENT SET FORTH ON THE DRAWINGS AND SPECIFICATIONS, BUT BY MEETING THE REGULATIONS SET FORTH BY THE AUTHORITY HAVING JURISDICTION OVER WATER QUALITY CONTROL AND OTHER SEDIMENTATION RESTRICTION REQUIREMENTS IN THE REGION.
2. APPROVED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY CLEARING, GRADING, EXCAVATION, FILLING, OR OTHER LAND DISTURBANCE ACTIVITIES, EXCEPT THOSE OPERATIONS NEEDED TO INSTALL SUCH MEASURES.
3. INSPECTION OF ALL EROSION CONTROL MEASURES SHALL BE CONDUCTED WEEKLY, OR AFTER EACH RAINFALL EVENT. REPAIR, AND/OR REPLACEMENT OF SUCH MEASURES SHALL BE MADE PROMPTLY, AS NEEDED.
4. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
5. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED IF DEEMED NECESSARY BY ONSITE INSPECTION.
6. FAILURE TO PROPERLY INSTALL AND MAINTAIN EROSION CONTROL PRACTICES SHALL RESULT IN CONSTRUCTION BEING HALTED.
7. DRAINAGE INLETS SHALL BE PROTECTED BY FILTER AND GRADED ROCK AS PER INLET PROTECTION DETAIL.
8. ANY ACCESS ROUTES TO SITE SHALL BE BASED WITH CRUSHED STONE, WHERE PRACTICAL.
9. EROSION CONTROL MEASURES ARE TO BE MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
10. WHENEVER FEASIBLE, NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED.
11. ALL WORK IS TO BE IN COMPLIANCE WITH THE RULES AND REGULATIONS SET FORTH BY THE STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE CITY OF DELRAY BEACH.
12. DISCHARGE FROM DEWATERING OPERATIONS SHALL BE RETAINED ONSITE IN A CONTAINMENT AREA.

**CITY of DELRAY BEACH**  
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EROSION CONTROL NOTES DETAIL

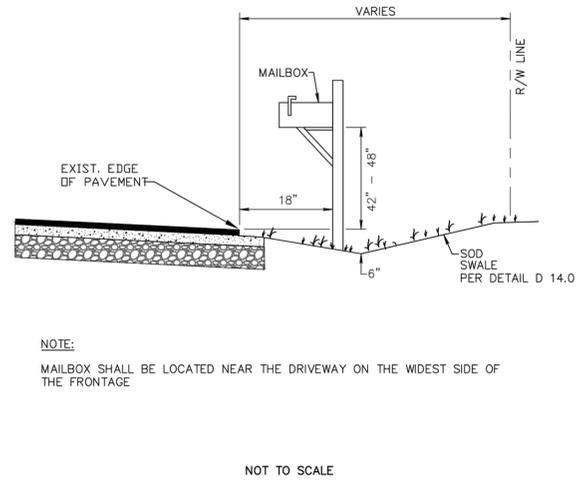
DATE: 09-15-2021  
D 11.0



**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

SWALE REPLACEMENT DETAIL

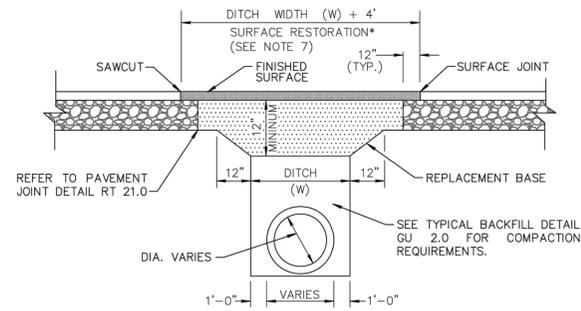
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**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

MAILBOX REPLACEMENT AND 6" SODDED SWALE DETAIL

DATE: 09-15-2021  
D 15.0

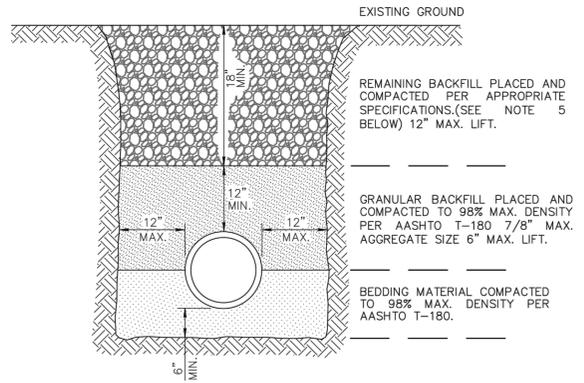


1. REPLACEMENT BASE TO BE AT MIN. 12" THICK.
2. BASE MATERIAL SHALL BE PLACED IN TWO LIFTS AND EACH LIFT COMPACTED TO 98% MAXIMUM DENSITY PER AASHTO T-180 (MAX. LIFT THICKNESS = 6").
- 2b. 24" EXCAVATABLE FLOWABLE FILL MIN. 100 P.S.I. MAY BE USED IN LIEU OF 12" BASE.
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. ALL DISTURBED PAVEMENT MARKINGS SHALL BE RESTORED IN ACCORDANCE WITH CITY STANDARDS.
5. SURFACE MATERIAL SHALL BE S-III ASPHALTIC CONCRETE (THICKNESS SHOULD BE TWICE THE THICKNESS OF THE ADJACENT EXISTING ASPHALT).
6. ANY PAVEMENT CUTS SHALL BE COLD PATCHED AT END OF EACH WORKING DAY TO FACILITATE UNHINDERED TRAFFIC FLOW.
7. ROADWAYS SHALL BE MILLED AND RESURFACED 50' IN EACH DIRECTION AT TIME OF PAVEMENT REPAIR THE SURFACE RESTORATION SHALL EXTEND 50' IN EACH DIRECTION.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PAVEMENT REPAIR DETAIL

DATE: 09-15-2021  
GU 1.0

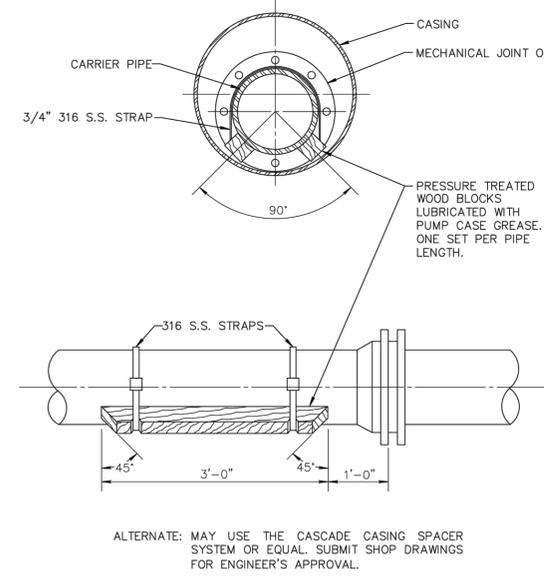


- NOTES:
1. UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS AND LARGE ROCKS SHALL BE REMOVED OFF-SITE AND DISPOSED IN A PROPER LANDFILL. BEDDING MATERIAL AND BACKFILL CONSISTING OF WASHED AND GRADED LIMEROCK 3/8" - 7/8" SIZING.
  2. THE PIPE AND/OR STRUCTURE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.
  3. THE PIPE AND/OR STRUCTURE SHALL BE PLACED IN A DRY TRENCH.
  4. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, AND DEBRIS.
  5. COMPACT BACKFILL TO 98% DENSITY UNDER PAVEMENT AND TO 95% DENSITY ELSEWHERE. (AASHTO T-180)
  6. COMPACTION AND DENSITY TESTS SHALL BE COMPLETED DURING BACKFILL OPERATIONS, CONTRACTORS NOT FOLLOWING THIS PROCEDURE, FOR WHATEVER REASONS, SHALL BE REQUIRED TO RE-EXCAVATE THE AREA IN QUESTION, DOWN TO THE BEDDING MATERIAL, THEN BACKFILL FOLLOWING THE ABOVE PROCEDURES.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL BACKFILL DETAIL

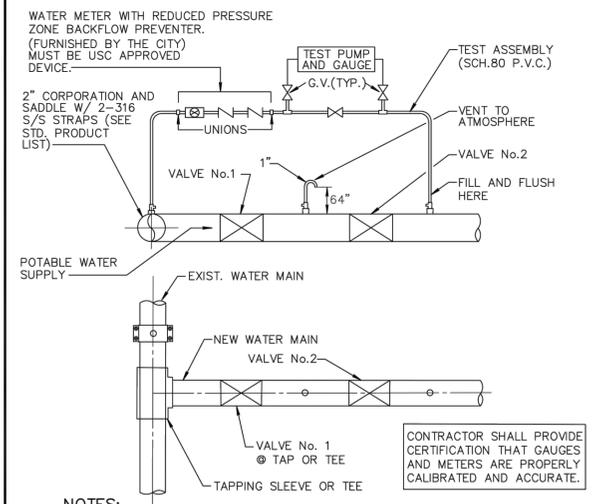
DATE: 09-15-2021  
GU 2.0



**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

CARRIER PIPE SUPPORTS

DATE: 09-15-2021  
GU 4.0

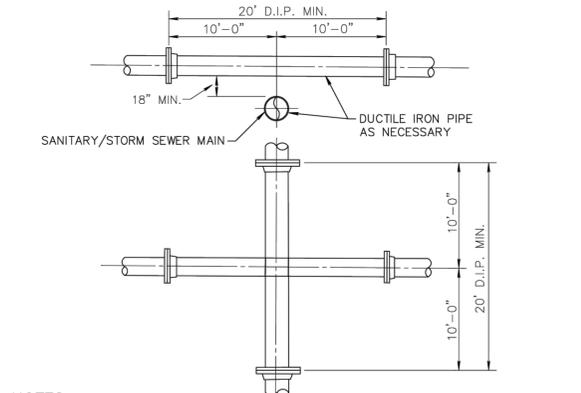


- NOTES:
1. BOTH VALVES SHALL BE KEPT CLOSED UNTIL FILLING, FLUSHING, AND BACTERIOLOGICAL TESTING IS COMPLETED AND APPROVED.
  2. GAUGE AND RISER TO BE REMOVED AFTER PRESSURE TEST.
  3. CITY SHALL BE NOTIFIED BEFORE FILLING AND FLUSHING.
  4. AFTER RELEASE FROM THE HEALTH DEPARTMENT, BOTH VALVES TO BE LEFT OPEN WITH VALVE BOX INSTALLED ON BOTH VALVES.
  5. PRESSURE TEST PUMP MAY CONNECT TO SERVICE LINE, FIRE HYDRANTS OR BLOWOFF. NO EXTRA TAPS ARE PERMITTED SOLELY FOR TESTING PURPOSES UNLESS PRECEDING ARE NOT PRESENT IN TEST SECTION.
  6. TAPPING SADDLE OR SLEEVE (PER CURRENT CITY PRODUCT LIST) IS REQUIRED ON EXISTING MAIN.
  7. SETUP FOR ALL DOUBLE VALVE CONNECTIONS TO INCLUDE ATMOSPHERE VENTS AS SHOWN ABOVE.
  8. OUTLET ON VENT TO ATMOSPHERE A MINIMUM 24" ABOVE EXISTING GRADE.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

FILL & FLUSH DETAIL

DATE: 09-15-2021  
PW 1.0



- NOTES:
1. STORM AND SANITARY SEWERS CROSSING UNDER WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER PIPE JOINTS AND WATER MAIN JOINTS ARE EQUIDISTANT FROM POINT OF CROSSING WITH NO LESS THAN (10) FEET BETWEEN ANY TWO JOINTS AND BOTH PIPES SHALL BE D.I.P. AND THE MINIMUM VERTICAL SEPARATION SHALL BE 6 INCHES. WHERE THERE IS NO ALTERNATIVE TO SEWER PIPES CROSSING OVER A WATER MAIN, THE CRITERIA FOR MINIMUM 18" VERTICAL SEPARATION BETWEEN LINES AND JOINT ARRANGEMENT, AS STARTED ABOVE, SHALL BE REQUIRED AND BOTH PIPES SHALL BE CLASS 350 D.I.P. IRRESPECTIVE OF SEPARATION. D.I.P. IS NOT REQUIRED FOR STORM SEWERS.
  2. MAINTAIN (10) FEET HORIZONTAL DISTANCE BETWEEN WATER MAIN AND STORM OR SANITARY SEWER MAIN, AS A MINIMUM.
  3. FORCE MAIN CROSSING WATER MAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE FORCE MAIN AND THE OUTSIDE OF THE WATER MAIN WITH WATER MAIN CROSSING OVER FORCE MAIN.
  4. SEWER SERVICE LATERALS SHALL CROSS UNDER WATER MAINS WITH A MINIMUM VERTICAL SEPARATION OF EIGHTEEN (18) INCHES. IF EIGHTEEN (18) INCHES VERTICAL SEPARATION CANNOT BE MAINTAINED, THEN THE WATERMAIN SHALL BE D.I.P. AND THE SANITARY LATERAL C-900 SDR18 OR BETTER AND THE MINIMUM SEPARATION SHALL BE SIX (6) INCHES.
  5. WHEN IT IS NOT POSSIBLE FOR THE WATER MAIN TO CROSS OVER THE SEWER SERVICE LATERAL A MINIMUM VERTICAL SEPARATION OF AT LEAST TWELVE (12) INCHES MUST BE MAINTAINED. THE WATERMAIN SHALL BE D.I.P. AND THE SEWER LATERAL SHALL BE C-900 SDR-18 OR BETTER.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

WATER MAIN & SEWER CONFLICTS

DATE: 09-15-2021  
PW 2.0

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ENGINEER'S SEAL

STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

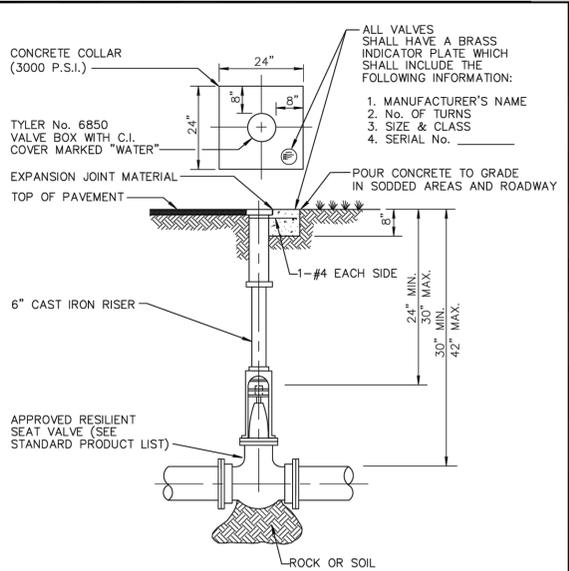
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P.E., LIC. NO. 83268

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA  
CITY OF DELRAY BEACH DETAILS

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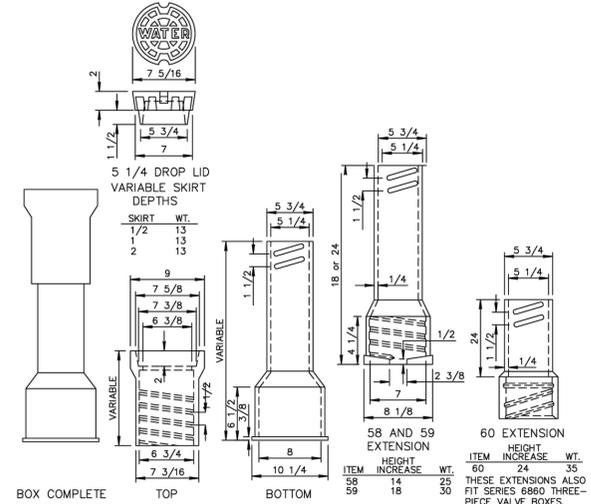


- NOTES:**
- WHEN VALVE IS DEEPER THAN 30" AN EXTENSION WITH UNIVERSAL JOINT SHALL BE REQUIRED TO BRING OPERATING NUT 24"-30" BELOW FINISHED GRADE EXTENSION BOLTS & NUTS SHALL BE 316 STAINLESS STEEL. A 316 STAINLESS STEEL CENTERING PLATE SHALL ALSO BE REQUIRED.
  - AT DEAD END OR WHERE MAIN LINES CHANGE DIRECTION, VALVES SHALL BE RESTRAINED USING MECHANICAL JOINT RESTRAINTS, TIE RODS, OR OTHER RESTRAINT APPROVED BY UTILITIES DEPARTMENT (NO THRUST BLOCKS ALLOWED).

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
TYPICAL GATE VALVE DETAIL  
4" THRU 12"  
DATE: 09-15-2021  
PW 3.0

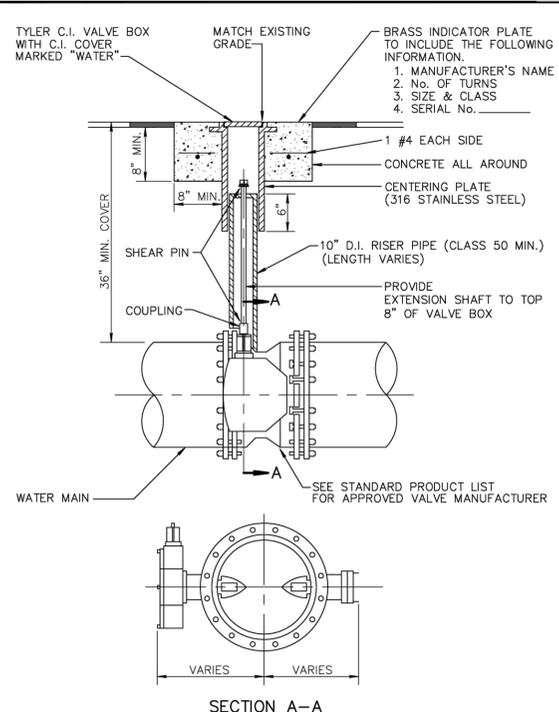
ITEM	BOX COMPLETE EXTENSION IN INCHES	WT.	TOP SECTION W/LID LENGTH	WT.	BOTTOM LENGTH	WT.	PIECES PER PKG.
461-S	19-22	60	10	35	15	25	..
462-S	27-32	70	10	35	24	35	..
562-S	27-37	80	16	45	24	35	..
563-S	33-43	85	16	45	30	40	20
564-S	39-50	90	16	45	36	40	20
662-S	36-52	105	26	65	30	40	20
664-S	39-60	110	26	65	36	40	20
666-S	51-71	135	26	65	**48	80	20
668-S	62-82	145	26	65	**60	80	20

\*\*MAY BE FURNISHED IN TWO PIECES SCREWED TOGETHER TO MAKE THE LENGTH REQUIRED.

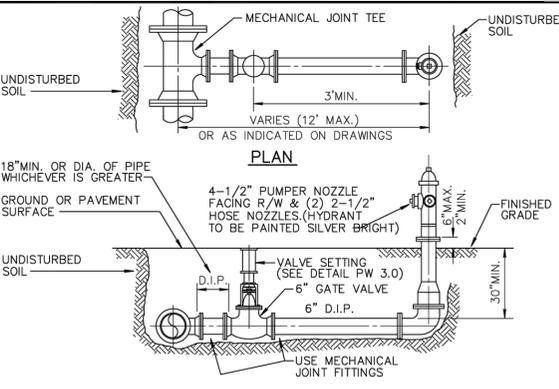


NOTE: LOCKING LIDS WILL NOT BE ACCEPTED.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
CAST IRON VALVE BOXES FOR TEMPORARY DEADENDS TWO PIECE  
DATE: 09-15-2021  
PW 4.0

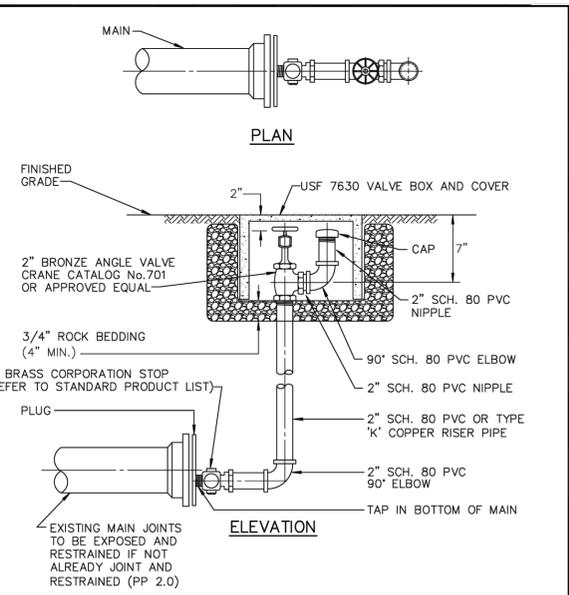


**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
TYPICAL BUTTERFLY VALVE SETTING  
DATE: 09-15-2021  
PW 5.0



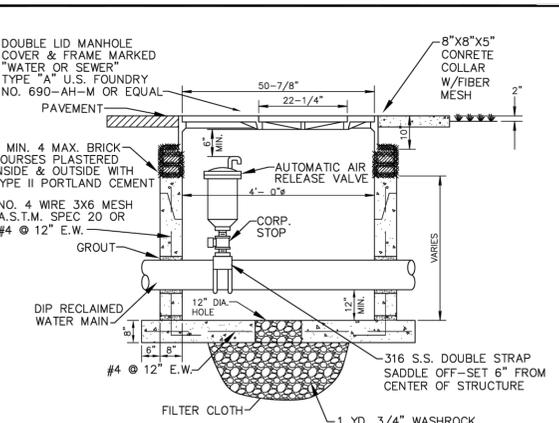
- NOTES:**
- HYDRANT SHALL BE INSTALLED PLUMB AND TRUE IN UNOBSTRUCTED LOCATION. (7.5' CLEARANCE ON THREE SIDES, 4' CLEARANCE AT REAR, WITH 3' ACCESS LANE)
  - NO BARREL EXTENSION SHALL BE PERMITTED.
  - VALVE SHALL BE PLACED ADJACENT TO MAIN.
  - ANCHOR TEES AND FITTINGS ARE PERMITTED.
  - HYDRANT SHALL BE MUELLER SUPER CENTURION, AA423 5 1/2" WITH TRAFFIC BREAKAWAY FLANGE AND 5 1/2" VALVE.
  - HYDRANTS SHALL NOT ENCR OACH IN SIDEWALKS, ROADWAYS, OR BIKE PATHS.
  - ON RUNS LONGER THAN 20 FEET A SECOND VALVE IS REQUIRED AT THE HYDRANT.
  - ALL HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH CITY OF DELRAY BEACH FIRE PREVENTION CODE SEC. 96.05.
  - IN CERTAIN SITUATIONS, PROTECTIVE BOLLARDS MAY BE REQUIRED AS DIRECTED BY THE ENGINEERING DEPT. (SEE BOLLARD DETAIL PW 7.0)
  - FIRE HYDRANTS INSTALLED BUT NOT YET IN SERVICE SHALL BE COVERED WITH A BURLAP, OR PLASTIC SACK, OR HAVE OUT OF SERVICE RING IN PLACE.
  - ALL HYDRANT LEADS GREATER THAN 20- FEET MUST HAVE AUTOMATIC FLUSHER INSTALLED AT HYDRANT END (KUPFERLE #9400-WC STANDARD).
  - REMOVE CHAINS FROM HYDRANT AND PAINT SHERWIN WILLIAMS SILVER BRITE.
  - NO THRUST BLOCKS SHALL BE PERMITTED.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
TYPICAL FIRE HYDRANT INSTALLATION  
DATE: 09-15-2021  
PW 6.0



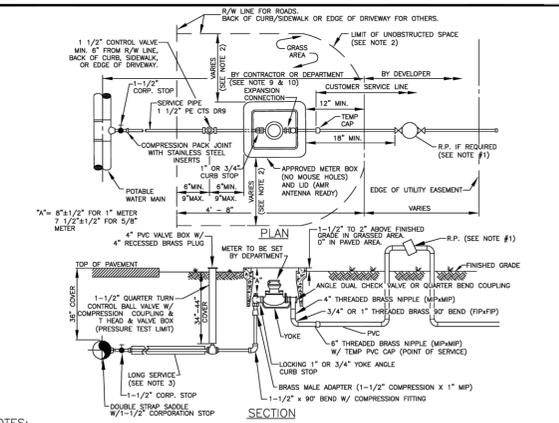
- NOTES:**
- GALVANIZED PIPING AND FITTINGS SHALL NOT BE USED.
  - JOINT RESTRAINTS TO BE INSTALLED MIN. TWO JOINTS BEFORE DEAD END.
  - KUPFERLE AUTOMATIC FLUSHING DEVICE IS TO BE USED AT ALL PERMANENT DEAD ENDS. (SEE PW 9.0)

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
TYPICAL 2" TERMINAL BLOWOFF FOR TEMPORARY DEADENDS  
DATE: 09-15-2021  
PW 8.0



- NOTES:**
- PRECAST CONCRETE TYPE # 4000 P.S.I.
  - ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
  - LIFT HOLES ARE PERMITTED.
  - ALL PIPE HOLES SHALL BE PRECAST OR CORE-DRILLED.
  - MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH A.S.T.M. C-478 LATEST STANDARD.
  - AIR RELEASE VALVE SHALL BE TYPE AND SIZE APPROPRIATE FOR SERVICE INTENDED.
  - AIR RELEASE VALVE AND PIPING TO BE IDENTIFIED AS "WATER OR SEWER".
  - TWO PIECE MANHOLE WITH JOINT AT BASE IS PERMITTED. NO PIPE JOINTS INSIDE MANHOLE.
  - DUCTILE IRON PIPE IS REQUIRED THROUGH THE VAULT.
  - THREADED AREAS OF CORPORATION STOP SHALL BE COMPLETELY SPIRAL WRAPPED WITH TWO WRAPS OF TEFLON TAPE.
  - CORPORATION STOP REFER TO STANDARD PRODUCT LIST.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
UNDERGROUND AIR RELEASE VALVE AND VAULT  
DATE: 09-15-2021  
PW 11.0



- NOTES:**
- ALL NON-RESIDENTIAL SERVICES AND RESIDENTIAL SERVICES WITH SEPARATE METERED RECLAIMED WATER SERVICE SHALL HAVE AN APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (R.P.P.). THE R.P.P. SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE POINT OF SERVICE NOT TO EXCEED 45' WITHOUT PRIOR DEPARTMENT APPROVAL.
  - LIMIT OF UNOBSTRUCTED SPACE FROM SIDE OF WATER METER BOX SHALL BE 36" MINIMUM FOR SHRUBS AND SIMILAR OBSTRUCTIONS WITH 60" MINIMUM FOR TREES, WALLS, AND OTHER SIMILAR OBSTRUCTIONS.
  - FOR INSTALLATION OF SERVICES UNDER DRIVEWAYS AND ROADWAYS USE MIN. 3" DIAMETER BLACK IRON, PVC SCH 40 OR HDPE SDR 9 CASING. CASING SHALL EXTEND MIN. 24" BEYOND EDGE OF PAVEMENT. END OF CASING TO BE SEALED WITH FOAM SEALANT. CASING SHALL BE COLOR-CODED BLACK, WHITE, BLUE, OR BLUE STRIPED.
  - SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" APART. TAPS ON SAME SIDE OF A PVC PIPE SECTION SHALL BE MIN. 10' APART.
  - METER SHALL NOT BE PLACED IN SIDEWALK OR DRIVEWAY AREAS. WATER SERVICE LINES AND TAPS SHALL NOT BE PLACED UNDER DRIVEWAYS WHENEVER POSSIBLE AND IF REQUIRED, ONLY WITH PRIOR DEPARTMENT APPROVAL.
  - MAXIMUM SERVICE LENGTH IS 100' TO METER.
  - BEDDING (MIN. 4") AND COVER (MIN. 4") OVER SERVICE LINE OR CASING SHALL CONSIST OF FINE GRANULAR MATERIAL UNSUITABLE IN-SITU MATERIALS SUCH AS MUD, DEBRIS AND LARGER ROCKS SHALL BE REMOVED WITH 2" MAXIMUM SIZE.
  - METER/SERVICE WILL NOT BE INSTALLED/ACTIVATED UNTIL:
  - ALL FORM BARRIERS FOR DRIVEWAY AND/OR SIDEWALK MUST BE COMPLETELY INSTALLED OR THE DRIVEWAY AND/OR SIDEWALK MUST HAVE BEEN INSTALLED.
  - "MINIMUM UNOBSTRUCTED SPACE" AS SHOWN IN NOTE 2 AND ON THE PLAN VIEW IS PROVIDED WITH 12" MINIMUM VERTICAL SEPARATION REQUIRED TO ALL OTHER UTILITIES.
  - THE REQUIRED BACKFLOW PREVENTION ASSEMBLY/DEVICE IS INSTALLED AND HAS PASSED INITIAL TEST.
  - METER TO BE INSTALLED BY DEPARTMENT. THE PIPING BEYOND THE CONTROL VALVE TO BE INSTALLED BY THE DEVELOPER OR THE DEPARTMENT DEPENDING ON THE TYPE OF SERVICE INSTALLATION REQUIRED.
  - THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR INSTALLATION OF SERVICES BEYOND PRESSURE TEST LIMITS AS SPECIFIED BY THE DEPARTMENT.
  - THREADED AREAS OF CORPORATION STOP AND OTHER FITTINGS SHALL BE SPIRAL WRAPPED WITH TWO (2) WRAPS OF TEFLON TAPE.
  - METER BOXES IN NON-GRASS AREAS SHALL HAVE TRAFFIC RATED LIDS.
  - A 12" THICK COMPACTED 3/4" ROCK BASE IS REQUIRED FOR METER BOXES OUTSIDE OF GRASS AREA. THE BASE SHALL EXTEND MIN. 12" BEYOND THE METER BOX PERIMETER.
  - STAINLESS STEEL INSERTS ARE REQUIRED FOR ALL COMPRESSION FITTINGS.
  - PVC SHALL BE SCHEDULE 40 PIPE WITH SCHEDULE 80 FITTINGS. ALL BRASS FITTINGS SHALL BE "LEAD FREE".

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
POTABLE WATER SERVICE SINGLE 1" METER INSTALLATION DETAIL  
DATE: 09-15-2021  
PW 12.0

REVISION  $\Delta$  - 3/25/24



**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
424 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
Phone: (561) 249-7822 Fax: (561) 249-7060 www.delraybeach.com

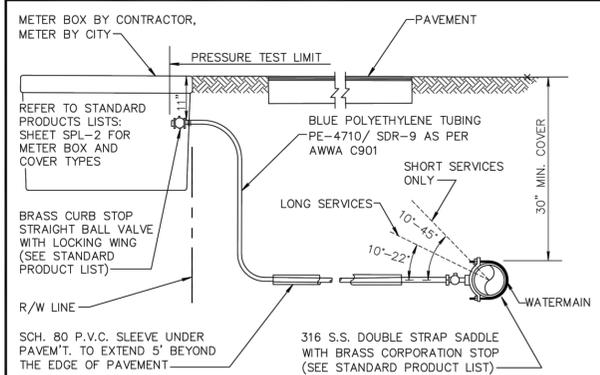
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**ENGINEER'S SEAL**  
STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

**CITY OF DELRAY BEACH DETAILS**

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA

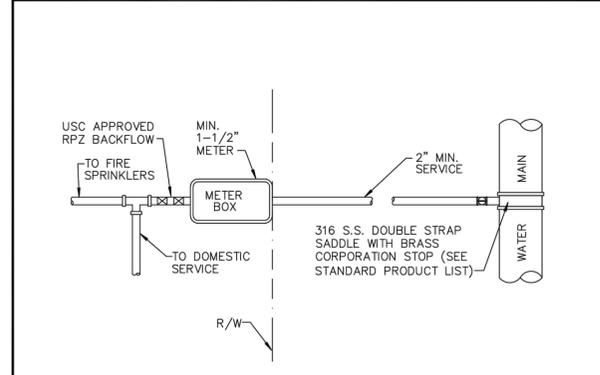
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**NOTES:**

- SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" ON CENTER.
- SERVICE LINES SHALL NOT BE PLACED UNDER DRIVEWAYS.
- ALL METERS REQUIRE A LOCKING BRASS CURB STOP WITH LOCK WING (1" MIN.).
- NO FITTINGS BETWEEN CORPORATION STOP AND BRANCH ASSEMBLY.
- MAXIMUM SERVICE LENGTH IS 100' TO METER.
- CASING PIPE I.D. SHALL BE SERVICE O.D. PLUS 1" MINIMUM.
- MINIMUM BEND RADIUS ON SERVICES SHALL BE 14" ON ALL SERVICES BEHIND METER.
- METER SIZE WILL BE DETERMINED BY PUBLIC UTILITIES DEPT. UPON APPLICATION FOR SERVICE.
- ALL VALVES TO BE BALL VALVES.
- METER BOX SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
- ALL SERVICES UNDER ROADWAYS ARE TO BE INSTALLED BY TRENCHLESS METHOD, UNLESS OTHERWISE APPROVED.
- ALL EXISTING SERVICES TO BE FIELD VERIFIED BY BUILDER/CONTRACTOR/DEVELOPER. IF EXISTING SERVICE IS GALVANIZED, BUILDER/CONTRACTOR/DEVELOPER SHALL REPLACE WITH POLYETHYLENE PIPING FROM MAIN TO THE METER.
- ALL COMMERCIAL WATER SERVICE SHALL BE A MINIMUM OF 2".
- WATER METERS SHALL BE LOCATED OUTSIDE ANY DRIVEWAYS BY 2'

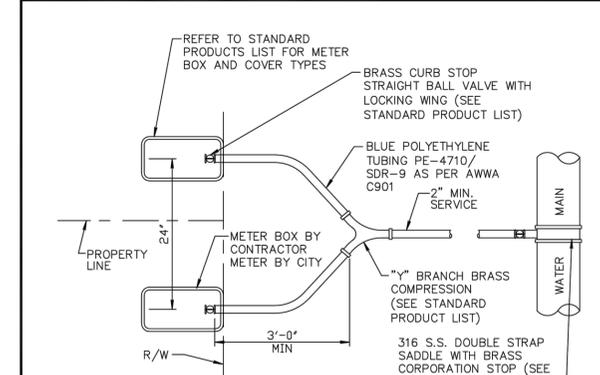
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL URBAN/REDEVELOPMENT AREA SERVICE CONNECTION IN DRIVEWAYS	DATE: 09-15-2021
		PW 13.0



**NOTES:**

- SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" ON CENTER.
- SERVICE LINES SHALL NOT BE PLACED UNDER DRIVEWAYS.
- ALL SERVICE LINES REQUIRE A LOCKING BRASS CURB STOP WITH LOCK WING (1" MIN.).
- NO FITTINGS BETWEEN CORPORATION STOP AND BRANCH ASSEMBLY.
- MAXIMUM SERVICE LENGTH IS 100' TO METER.
- CASING PIPE I.D. SHALL BE SERVICE O.D. PLUS 1" MINIMUM.
- MINIMUM BEND RADIUS ON SERVICES SHALL BE 14" ON ALL SERVICES BEHIND METER.
- ALL VALVES TO BE BALL VALVES.
- METER BOX SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
- ALL EXISTING SERVICES TO BE FIELD VERIFIED BY BUILDER/CONTRACTOR/DEVELOPER. IF EXISTING SERVICE IS GALVANIZED, BUILDER/CONTRACTOR/DEVELOPER SHALL REPLACE WITH POLYETHYLENE PIPING FROM MAIN TO METER.

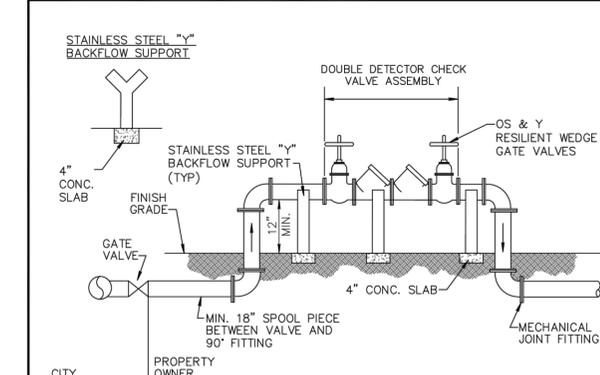
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL FIRE SERVICE CONNECTION	DATE: 09-15-2021
		PW 14.0



**NOTES:**

- SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" ON CENTER.
- SERVICE LINES SHALL NOT BE PLACED UNDER DRIVEWAYS.
- ALL METERS REQUIRE A LOCKING BRASS CURB STOP WITH LOCK WING (1" MIN.).
- NO FITTINGS BETWEEN CORPORATION STOP AND BRANCH ASSEMBLY.
- MAXIMUM SERVICE LENGTH IS 100' TO METER.
- CASING PIPE I.D. SHALL BE SERVICE O.D. PLUS 1" MINIMUM.
- MINIMUM BEND RADIUS ON SERVICES SHALL BE 14" ON ALL SERVICES BEHIND METER.
- METER SIZE WILL BE DETERMINED BY PUBLIC UTILITIES DEPT. UPON APPLICATION FOR SERVICE.
- ALL VALVES TO BE BALL VALVES.
- METER BOX SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
- ALL SERVICES UNDER ROADWAYS ARE TO BE INSTALLED BY TRENCHLESS METHOD, UNLESS OTHERWISE APPROVED.
- ALL EXISTING SERVICES TO BE FIELD VERIFIED BY BUILDER/CONTRACTOR/DEVELOPER. IF EXISTING SERVICE IS GALVANIZED, BUILDER/CONTRACTOR/DEVELOPER SHALL REPLACE WITH POLYETHYLENE PIPING FROM MAIN TO METER.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL DOUBLE SERVICE CONNECTION	DATE: 09-15-2021
		PW 15.0



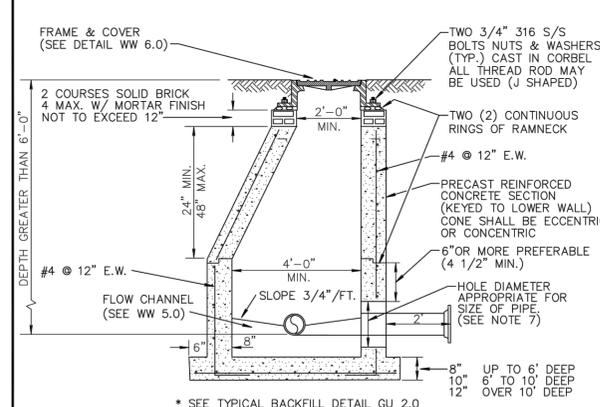
**NOTES:**

- FOR ALL SERVICES GREATER THAN 2" DIA.
- ALL PIPE AND FITTINGS SHALL BE CLASS 350 DUCTILE IRON CEMENT LINED WITH CEMENT LINED DUCTILE IRON FLANGE FITTINGS. FOR ABOVE GROUND USE, MECHANICAL JOINT SHALL BE USED UNDERGROUND IN ACCORDANCE WITH AWWA STANDARDS.
- THE DOUBLE DETECTOR CHECK VALVE ASSEMBLY SHALL MEET AWWA M14 AND AWWA C510, AND APPROVAL OF UTILITIES DEPARTMENT.
- CERTIFICATION OF PROPER INSTALLATION AND OPERATION WILL BE REQUIRED FROM A CERTIFIED BACKFLOW PREVENTION TECHNICIAN PRIOR TO WATER MAIN ACCEPTANCE BY THE CITY OF DELRAY BEACH.
- THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE PROPER OPERATION, MAINTENANCE AND ANNUAL TESTING OF THE DOUBLE DETECTOR CHECK VALVE ASSEMBLY.
- BOLLARDS TO BE USED IF THE ASSEMBLY IS WITHIN 5' OF THE PAVEMENT, REFER TO BOLLARD DETAIL PW 7.0.
- CITY OF DELRAY BEACH WILL MAINTAIN TILL THE FIRST GATE VALVE.
- WATER MAIN WILL BE PLACED IN A UTILITY EASEMENT UP UNTIL THE FIRST GATE VALVE. DOUBLE DETECTOR ASSEMBLY WILL NOT BE WITHIN THE EASEMENT.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	DOUBLE DETECTOR CHECK VALVE	DATE: 09-15-2021
		PW 16.0

- GRAVITY SEWER NOTES**
- MANHOLES SHALL BE INSPECTED BY THE ENGINEER BEFORE PLACEMENT AND SURFACE TREATMENT.
  - ALL OPENINGS IN PRECAST MANHOLES SHALL BE CAST AT TIME OF MANUFACTURE. CONNECTIONS TO EXISTING MANHOLES SHALL BE CORE ENTRY ONLY.
  - ALL MANHOLES SHALL BE SET PLUMB TO LINE AND GRADE.
  - (PVC) GRAVITY SEWER PIPE SHALL CONFORM TO ASTM D 3034, SDR 35, LATEST REVISIONS, WITH PUSH ON RUBBER GASKET JOINTS.
  - (DIP) GRAVITY SEWER PIPE SHALL BE CLASS 350, 401 EPOXY LINED OR AS OTHERWISE APPROVED BY UTILITIES DEPARTMENT.
  - NO SERVICE CONNECTIONS, WYES, SERVICES OR VALVES WILL BE PERMITTED IN RESIDENTIAL DRIVEWAYS.
  - MANHOLE FRAMES SHALL BE ATTACHED TO THE PRECAST STRUCTURE WITH A MINIMUM OF TWO 3/4" 316 STAINLESS STEEL BOLTS, NUTS AND WASHERS. FRAMES SHALL BE SEALED WITH A MINIMUM OF TWO 1/2" BEADS OF RAM-NEK CAULKING.
  - TRENCHES SHALL BE DE-WATERED TO ENABLE PIPE AND APPURTENANCES TO BE INSTALLED FREE OF WATER ON UNDISTURBED SOIL. IF UNSUITABLE SUBSURFACE MATERIAL IS ENCOUNTERED, EXCAVATE EXTRA 6" AND BACKFILL WITH 3/4" GRAVEL.
  - PVC SHALL BE LAID IN STRICT CONFORMANCE TO MANUFACTURER'S SPEC (JOHNS MANVILLE RING TIE PVC PIPE INSTALLATION GUIDE OR EQUAL). BACKFILLING OF UTILITY TRENCHES WILL NOT BE ALLOWED UNTIL INSPECTED BY THE ENGINEER.
  - BACKFILL MATERIAL FOR SEWER MAIN AND LINES SHALL BE NON-COHESIVE, NON PLASTIC MATERIAL FREE OF ALL DEBRIS, LUMPS AND ORGANIC MATTER. BACKFILL MATERIAL PLACED WITHIN ONE (1) FOOT OF PIPING AND APPURTENANCES SHALL NOT CONTAIN ANY STONES LARGER THAN TWO (2) INCHES IN DIAMETER (1" FOR PVC PIPE) AND NO STONES LARGER THAN SIX (6) INCHES IN DIAMETER WILL BE PERMITTED IN ANY BACKFILL.
  - ANY EXCAVATION IN EXISTING RIGHT OF WAY SHALL BE BACKFILLED AND STABILIZED AT THE END OF EACH DAY TO PERMIT PEDESTRIAN AND VEHICULAR TRAFFIC PRIOR TO THE CONTRACTOR LEAVING THE SITE.
  - WHERE SEWER IS NOT WITHIN PUBLIC R/W, IT IS TO BE LOCATED IN A 12' UTILITY EASEMENT. CITY MAINTENANCE RESPONSIBILITY IS MANHOLE ONLY.
  - UPON COMPLETION OF THE WORK AND PRIOR TO PLACEMENT OF ASPHALT A VISUAL INSPECTION BY THE ENGINEER SHALL BE MADE OF THE COMPLETED SYSTEM ALONG WITH A LOW PRESSURE AIR TEST, AFTER ROCK BASE FINISHED & PRIMED, OR 1ST LIFT OF ASPHALT PLACED. AFTER ALL OTHER TESTING HAS BEEN COMPLETED, A CD VIDEO RECORDING SHALL BE MADE BY THE CONTRACTOR AND APPROVED BY THE ENGINEER, BEFORE THE LENGTHS ARE ACCEPTED FOR MAINTENANCE.
  - EACH LINE SEGMENT SHALL BE LAMPED TO DETERMINE PROPER ROUNDNESS.
  - COMPLETE "AS BUILT" INFORMATION RELATIVE TO MANHOLES, VALVES, SERVICES FITTINGS, PIPE LENGTHS, INVERTS AND SLOPES SHALL BE ACCURATELY RECORDED & SUBMITTED TO THE ENGINEER CITY SIGNED AND SEALED BY A REGISTERED LAND SURVEYOR.
  - AT THE END OF THE ONE (1) YEAR WARRANTY PERIOD THE DEVELOPER/CONTRACTOR WILL TV, INSPECT AIR TEST EVERY JOINT, AND CHECK MANHOLE JOINTS AND CONNECTIONS TO DETERMINE IF REPAIRS ARE NECESSARY BEFORE THE WARRANTY BOND IS RELEASED.
  - NO PROPOSED STRUCTURES SHALL BE INSTALLED WITHIN A HORIZONTAL DISTANCE OF 10- FEET FROM ANY EXISTING OR PROPOSED SANITARY SEWER FACILITY.
  - ANY PIPE INTRODUCED INTO AN EXISTING MANHOLE MUST HAVE CARBOLINE BITUMASTIC 300M OR APPROVED EQUAL APPLIED EXTERNALLY WITHIN A MINIMUM 2'-FOOT RADIUS OF OPENING AND THE ENTIRE MANHOLE MUST HAVE SEWPER COAT OR APPROVED EQUAL APPLIED INTERNALLY.
  - ANY REHABILITATION TO AN EXISTING MANHOLE MUST BE INTERNALLY STRIPPED AND LINED WITH SEWPER COAT OR APPROVED EQUAL.

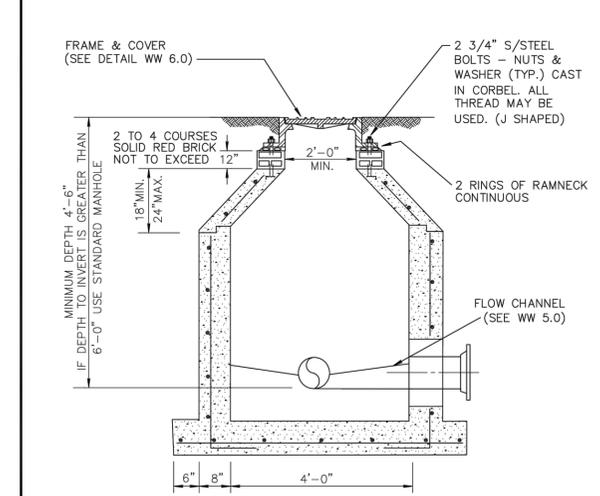
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	GRAVITY SEWER NOTES	DATE: 09-15-2021
		WW 1.0



**NOTES:**

- PRECAST CONCRETE TYPE II 4000 P.S.I.
- RAMNECK AT ALL RISER JOINTS WITH GROUT ON INSIDE AND OUTSIDE AT ALL RISER JOINTS.
- ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
- FLOW CHANNELS SHALL BE CONSTRUCTED TO DIRECT INFLUENT INTO FLOW STREAM.
- LIFT HOLES SHALL BE FILLED WITH EXPANDABLE GROUT.
- ALL PIPE HOLES SHALL BE PRECAST.
- CAST IN PLACE FLEXIBLE PIPE-TO MANHOLE CONNECTOR (LOCK JOINT FLEXIBLE SLEEVE ELASTOMER EPDM OR RUBBER GASKET WITH GLASS FIBER REINFORCED NYLON 6/6 INTERNAL EXPANSION RING) INSTALLED PER MANUFACTURER.
- PAINT MANHOLE INSIDE AND OUTSIDE WITH ONE (1) COAT RED CARBOLINE BITUMASTIC 300M THEN ONE (1) COAT BLACK OR APPROVED EQUAL, TO 8-10 MILS D.F.T./COAT, FIRST COAT RED THEN BLACK.
- MANHOLE FABRICATION SHALL BE IN ACCORDANCE W/ ASTM C-478, LATEST STANDARD.
- IF THE STRUCTURE IS INSTALLED IN WATER TABLE MUST HAVE BEDDING. (SEE DETAIL BEDDING WW 11.0)

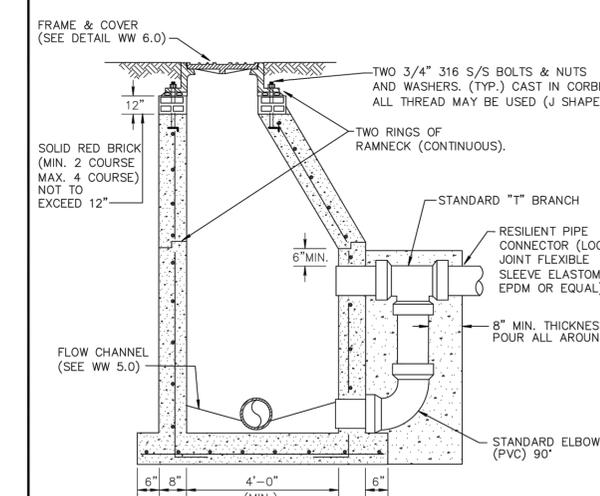
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	STANDARD MANHOLE DETAIL	DATE: 09-15-2021
		WW 2.0



**NOTE:**

ALL STANDARD MANHOLE NOTES AND DETAILS ARE APPLICABLE (DETAIL WW 2.0).

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SHALLOW MANHOLE DETAIL	DATE: 09-15-2021
		WW 3.0



**NOTES:**

- ALL DETAILS AND SPECIFICATIONS FOR STANDARD MANHOLES ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
- DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL.
- NO INSIDE DROP SHALL BE ALLOWED.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	DROP MANHOLE DETAIL	DATE: 09-15-2021
		WW 4.0

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N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
 CITY OF DELRAY BEACH PROJECT NO. 19-012  
 DELRAY BEACH, PALM BEACH COUNTY, FLORIDA  
 CITY OF DELRAY BEACH DETAILS

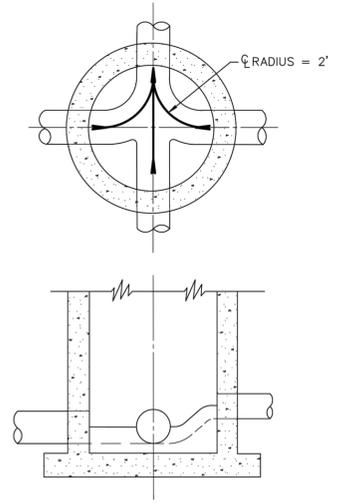
SHEET  
**C605**  
 121 OF 223  
 5567.00

ENGINEER'S SEAL  
 STEPHEN CHERRY, PE  
 P.E., LIC. NO. 83268

CITY of DELRAY BEACH  
 PUBLIC WORKS DEPARTMENT  
 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
 Phone: (561) 249-7822 Fax: (561) 249-7080 www.delraybeach.com

CERT. NO. 6091  

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 2025 VISTA PARKWAY, WEST PALM BEACH, FLORIDA 33411

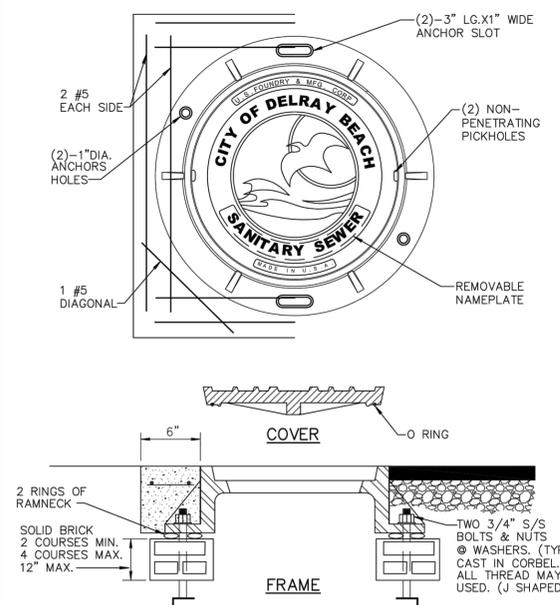


- NOTES:**
1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION OR TURBULENCE.
  2. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
  3. SERVICE LATERALS SHALL NOT ENTER MANHOLES.
  4. 2500 PSI CONCRETE ONLY PERMITTED AS FLOW CHANNEL BUILDUP.
  5. NO DOG HOUSE MANHOLE ALLOWED.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

INVERT FLOW CHANNELS

DATE: 09-15-2021  
WW 5.0

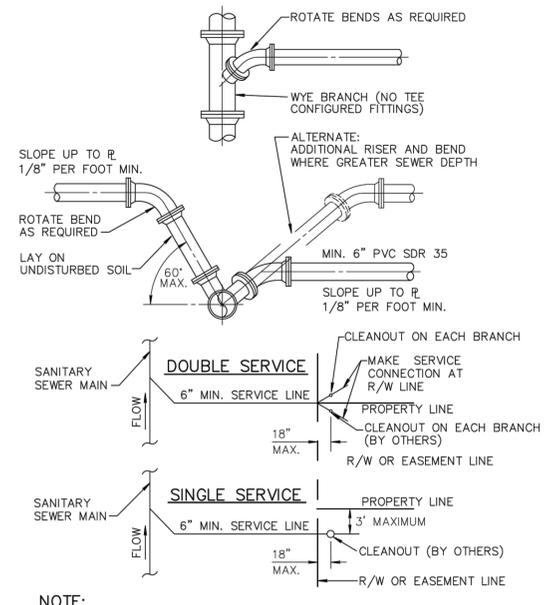


- NOTES:**
1. COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.
  2. COVER SHALL BE U.S. MR-ORS AND RING SHALL BE USF 576 RING WITH BITUMASTIC COAL TAR.
  3. MANHOLE ADJUSTING RINGS SHALL BE CAST IRON, USF TYPE MR.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

SANITARY SEWER MANHOLE  
FRAME AND COVER

DATE: 09-15-2021  
WW 6.0

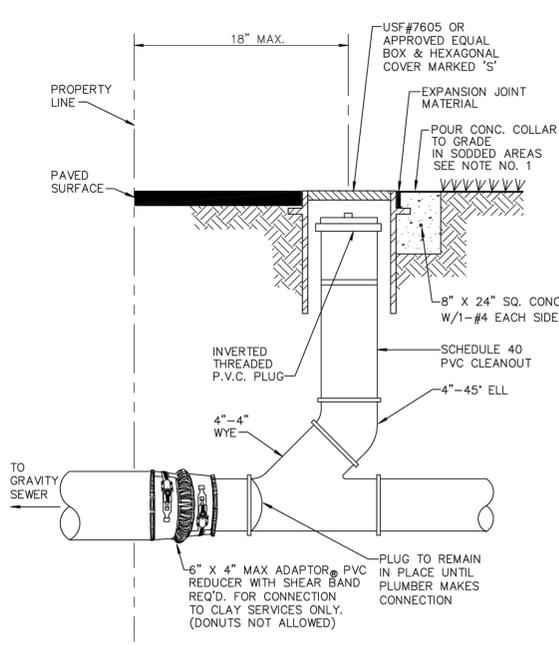


- NOTE:**
1. SERVICE LATERALS SHALL TERMINATE INSIDE PROPERTY LINE A DEPTH OF 3 FEET AND MARKED WITH A 2" X 4" TREATED STAKE.
  2. CLEANOUT INSTALLATION SHALL BE PROPERTY OWNERS RESPONSIBILITY AND SHALL BE INSTALLED BY LICENSED PLUMBER.
  3. SEE DETAIL PW 2.0 FOR SEPARATION REQUIREMENTS.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

SEWER SERVICE CONNECTION

DATE: 09-15-2021  
WW 8.0

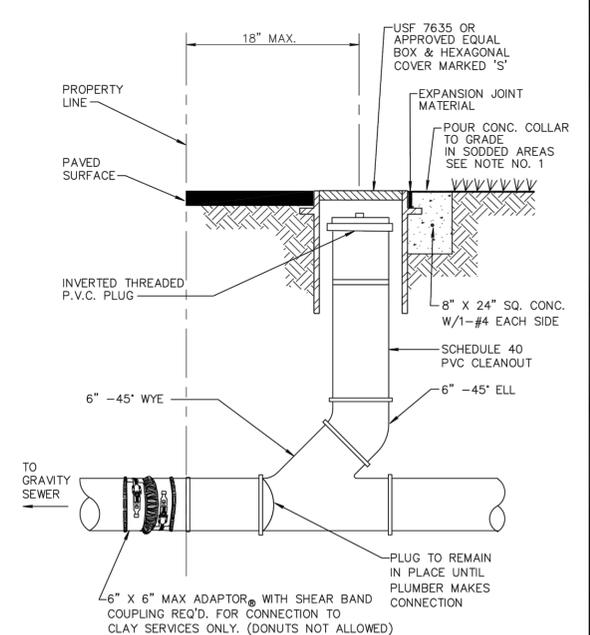


- NOTE:**
1. INVERTED BRASS CAP SHALL BE USED IN GRASS AREAS IN LIEU OF CASTING AND CONE COLLAR.
  2. MINIMUM DEPTH OF SERVICE LATERAL SHALL BE 3 FEET.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL RESIDENTIAL CLEANOUT

DATE: 09-15-2021  
WW 9.0

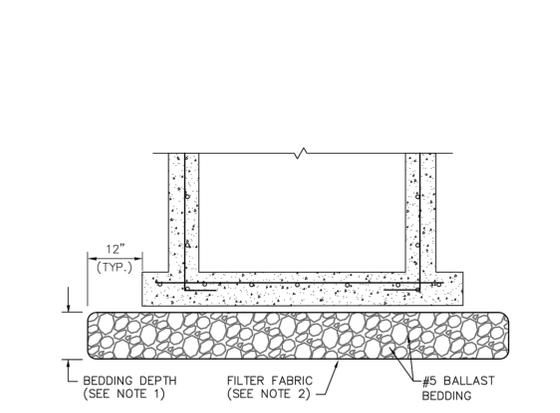


- NOTE:**
1. INVERTED BRASS CAP SHALL BE USED IN GRASS AREAS IN LIEU OF CASTING AND CONE COLLAR.
  2. MINIMUM DEPTH OF SERVICE LATERAL SHALL BE 3 FEET.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL COMMERCIAL CLEANOUT

DATE: 09-15-2021  
WW 10.0



- NOTES:**
1. BEDDING DEPTH SHALL BE 10" UNDER DRAINAGE STRUCTURES AND 18" UNDER SANITARY STRUCTURES.
  2. ROCK SHALL BE WRAPPED IN FILTER FABRIC THAT MEETS THE REQUIREMENTS OF F.D.O.T. SPECIFICATION SECTION 985.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

STANDARD BEDDING DETAIL

DATE: 09-15-2021  
WW 11.0

- PRESSURE PIPE NOTES:**
1. FOR PIPE SIZES 4"-8" THERE SHALL BE 30" MINIMUM COVER FROM FINISHED GRADE TO TOP OF PIPE. FOR PIPE SIZE 10" AND LARGER THERE SHALL BE 36" MINIMUM COVER.
  2. DUCTILE IRON PIPE (DIP) FOR FORCE MAINS SHALL BE CLASS 350 WITH 401 EPOXY LINING IN ACCORDANCE WITH AWWA C550.
  3. DUCTILE IRON PIPE (DIP) FOR WATER MAINS SHALL BE CLASS 350 IN ACCORDANCE WITH AWWA C151 (ANSI A21.51), AND SHALL HAVE AN INTERNAL LINING OF CEMENT MORTAR IN ACCORDANCE WITH AWWA C104/ A21.4.
  4. C-900 PVC PRESSURE PIPE MAY BE USED IN LIEU OF DIP WATER MAIN WITH METAL TAPE AND WIRE ABOVE THE PIPE.
  5. ALL FITTINGS FOR FORCE MAIN SHALL BE CLASS 350 DUCTILE IRON WITH MECHANICAL JOINTS AND 401 EPOXY LINING.
  6. WATER MAIN VALVES 12 INCHES AND SMALLER SHALL BE RESILIENT-SEAL WEDGE GATE VALVES IN ACCORDANCE WITH AWWA C509. WATER MAIN VALVES LARGER THAN 12 INCHES SHALL BE BUTTERFLY VALVES IN ACCORDANCE WITH AWWA C504. SEWAGE FORCE MAIN VALVES SHALL BE RESILIENT-SEAL PLUG VALVES IN ACCORDANCE WITH AWWA C517.
  7. ALL TRENCHING, PIPE-LAYING, BACKFILL, PRESSURE TESTING, AND DISINFECTION MUST COMPLY WITH CITY AND LOCAL GOVERNMENTAL REGULATIONS AND STANDARDS.
  8. WATER AND FORCE MAINS SHALL BE PIGGED A MINIMUM OF TWO TIMES, AND ADDITIONALLY, IF REQUIRED BY ENGINEER OF RECORD, AS WELL AS, PRESSURE TESTED FOR A PERIOD OF NOT LESS THAN TWO HOURS AT 150 PSI IN ACCORDANCE WITH ANSI/AWWA C600 LATEST STANDARDS. ALLOWABLE LEAKAGE SHALL BE DETERMINED AS FOLLOWS:  
$$L = \frac{SD\sqrt{P}}{148,000}$$

WHERE:  
L = ALLOWABLE LEAKAGE (GALLONS PER HOUR)  
S = PIPE LENGTH (FEET)  
D = NOMINAL DIAMETER OF PIPE (INCHES)  
P = AVERAGE TEST PRESSURE (PSI)
  9. RESTRAINTS SHALL BE PROVIDED AT ALL FITTINGS AS SHOWN ON PP 2.0 AND 2.1
  10. PRIOR TO ANY TESTING UNDER FUTURE PAVEMENT, ROCK SHALL BE FINISHED & PRIMED OR 1ST LIFT OF ASPHALT PLACED.
  11. PIG SIZE SHALL BE PIPE DIAMETER PLUS 2" OR NEXT LARGER DIAMETER.
  12. NO PROPOSED STRUCTURES SHALL BE INSTALLED WITHIN A HORIZONTAL DISTANCE OF 10- FEET FROM ANY EXISTING OR PROPOSED WATER OR FORCE MAINS.
  13. LINE STOPS SHALL BE INSTALLED A MINIMUM OF 3 PIPE LENGTHS FROM LOCATION OF PIPE REMOVED AND PROVIDE NECESSARY JOINT RESTRAINTS.

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PRESSURE PIPE NOTES

DATE: 09-15-2021  
PP 1.0

**MINIMUM LENGTHS OF PIPE (FT) TO BE RESTRAINED**

FITTING TYPE	PIPE SIZE							
	4"	6"	8"	10"	12"	16"	20"	24"
90° HORIZ. BEND	14	20	25	30	35	45	54	62
45° HORIZ. BEND	6	8	11	13	15	19	22	26
22.5° HORIZ. BEND	3	4	5	6	7	9	11	12
11.25° HORIZ. BEND	1	2	3	3	4	4	5	6
90° VERT. OFFSET	UPPER BEND	55	79	103	125	147	189	228
	LOWER BEND	22	38	49	59	69	88	106
45° VERT. OFFSET	UPPER BEND	22	32	42	51	60	77	93
	LOWER BEND	10	14	19	23	28	35	43
22.5° VERT. OFFSET	UPPER BEND	7	12	17	21	26	34	42
	LOWER BEND	2	4	6	8	10	14	17
11.25° VERT. OFFSET	UPPER BEND	3	4	6	9	11	15	19
	LOWER BEND	1	1	1	2	3	5	7
PLUG (DEAD END)	32	45	59	70	83	107	129	151
TEE (BRANCH RESTRAINT)	4" X 6"	23						
	6" X 6"	21	35					
	8" X 6"	18	34	47				
	10" X 6"	16	32	46	58			
	12" X 6"	13	30	44	57	69		
	16" X 6"	7	26	41	55	67	90	
	20" X 6"	1	21	38	52	65	88	109
	24" X 6"	1	16	34	49	62	86	108
REDUCER (LARGER PIPE RESTRAINT)	6" X 6"	23						
	8" X 6"	38	25					
	10" X 6"	57	43	24				
	12" X 6"	72	60	44	41			
	16" X 6"	99	90	78	75	45		
20" X 6"	123	116	107	105	81	45		
24" X 6"	146	140	132	131	111	82	45	

RESTRAIN PIPE ONE BELL PAST MINIMUM DISTANCE

CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PIPE RESTRAINT TABLE  
PRESSURE PIPE  
(SHEET 1 OF 2)

DATE: 09-15-2021  
PP 2.0



CITY of DELRAY BEACH  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
Phone (561) 249-7822 Fax (561) 249-7060 www.delraybeach.com

CERT. NO. 6091

**WGL**  
WGInc.com

2035 VISTA PARKWAY, WEST PALM BEACH, FLORIDA 33411

ENGINEER'S SEAL

STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA

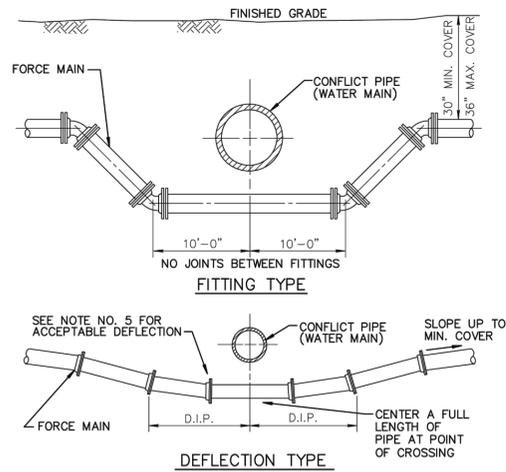
CITY OF DELRAY BEACH DETAILS

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122 OF 223  
5567.00

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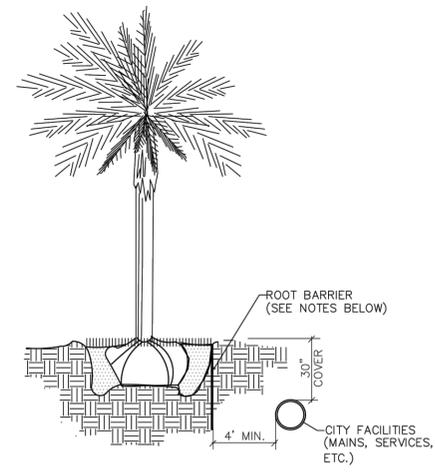
- NOTES:
- THE DATA IN THE PREVIOUS TABLE IS BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:  
 SOIL TYPE .....SAND  
 TEST PRESSURE .....150 PSI, 200 PSI FOR PIPES LARGER THAN 24"  
 DEPTH OF BURY .....3'  
 TRENCH TYPE .....3  
 SAFETY FACTOR .....1.5  
 VERTICAL OFF-SET .....3'  
 MINIMUM PIPE LENGTHS  
 ALONG TEE RUN .....5'
  - THE RESTRAINED PIPE LENGTHS APPLY TO DUCTILE IRON PIPE AND PVC PIPE.
  - ALL JOINTS BETWEEN UPPER AND LOWER BENDS SHALL BE RESTRAINED.
  - RESTRAINED PIPE LENGTHS FOR VALVES APPLY TO PIPE ON BOTH SIDES OF VALVES
  - THE PREVIOUS TABLE SHALL SERVE AS A GENERAL DESIGN GUIDE ONLY. IT IS THE ENGINEER OF RECORD'S RESPONSIBILITY TO JUSTIFY AND DOCUMENT ANY DEVIATIONS FROM THE PIPE LENGTHS SPECIFIED IN THE PREVIOUS TABLE.
  - SOURCES: EBAA IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1 (LATEST EDITION) AND DIPRA RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2 (LATEST EDITION).
  - RESTRAINED JOINTS SHALL EXTEND ONE JOINT BEYOND MINIMUM LENGTH REQUIRED.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	PIPE RESTRAINT TABLE PRESSURE PIPE (SHEET 2 OF 2)	DATE: 09-15-2021 PP 2.1
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



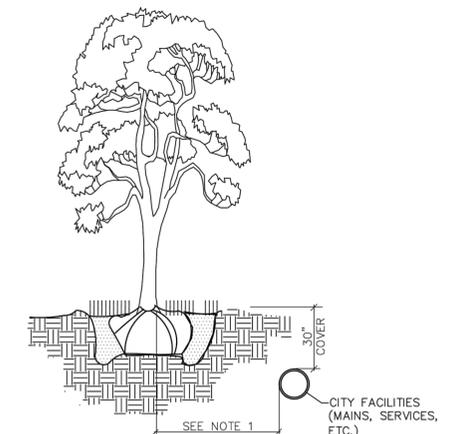
- NOTES:
- THERE SHALL BE IN ALL CASES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN WATER MAINS AND FORCE MAINS.
  - WHEREVER POSSIBLE WATER MAINS SHALL PASS OVER FORCE MAINS OR STORM SEWERS.
  - FITTINGS SHALL BE RESTRAINED WITH MECHANICAL JOINT RESTRAINTS.
  - THE DEFLECTION TYPE CROSSING IS PREFERRED.
  - DO NOT EXCEED 75% OF MANUFACTURERS RECOMMENDED MAXIMUM JOINT DEFLECTION.
  - REFER TO TYPICAL RESTRAINING DETAIL PP 2.0 AND 2.1

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	PRESSURE PIPE CONFLICT TABLE	DATE: 09-15-2021 PP 3.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



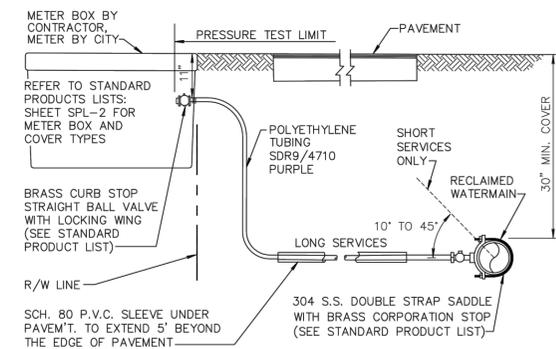
- NOTES:
- ALL ROOT BARRIERS SHALL BE 4" MINIMUM FROM ALL CITY FACILITIES.
  - THE INSTALLATION OF ROOT BARRIERS SHALL BE COORDINATED WITH CITY AND INSPECTED BY CITY PRIOR TO BACKFILLING. ALL ROOT BARRIERS SHALL EXTEND UP TO FINISHED GRADE.
  - ROOT BARRIERS SHALL BE MINIMUM 36" DEEP. APPROVED PRODUCTS INCLUDE "DEEP ROOT" AND "ROOT SOLUTIONS". FLEXIBLE BARRIERS SHALL BE 36" PANELS MANUFACTURED BY BIOBARRIER.
  - ALL ROOT BARRIERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL TREE WITH ROOT BARRIER	DATE: 09-15-2021 LD 1.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



- NOTES:
- THIS DISTANCE SHALL BE 10' MINIMUM FROM ALL CITY FACILITIES IF NO ROOT BARRIER IS USED.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL TREE WITHOUT ROOT BARRIER	DATE: 09-15-2021 LD 2.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	

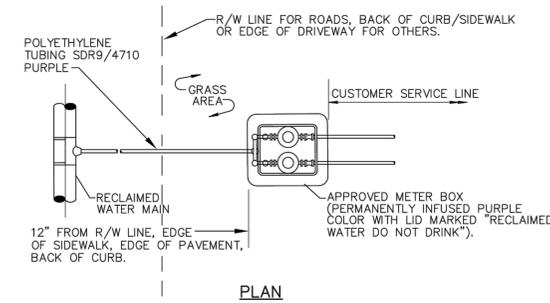


- NOTES:
- SUCCESSIVE TAPS INTO THE RECLAIMED WATER MAIN SHALL BE SPACED A MINIMUM OF 18" ON CENTER.
  - SERVICE LINES SHALL NOT BE PLACED UNDER DRIVEWAYS.
  - ALL METERS REQUIRE A LOCKING BRASS CURB STOP WITH LOCK WING (1" MIN.).
  - NO FITTINGS BETWEEN CORPORATION STOP AND BRANCH ASSEMBLY.
  - MAXIMUM SERVICE LENGTH IS 100' TO METER.
  - MINIMUM BEND RADIUS ON SERVICES SHALL NOT BE LESS THAN 30 TIMES THE PIPE DIAMETER ON ALL SERVICES BEHIND METER.
  - METER SIZE WILL BE DETERMINED BY THE UTILITIES DEPT. UPON APPLICATION FOR SERVICE.
  - ALL VALVES TO BE BALL VALVES.
  - METER BOX SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
  - METER BOX SHALL BE PERMANENTLY INFUSED PURPLE COLOR WITH LID MARKED "RECLAIMED WATER DO NOT DRINK."

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL SERVICE CONNECTION 3/4" THROUGH 2" (SHEET 1 OF 2)	DATE: 09-15-2021 RW 1.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	

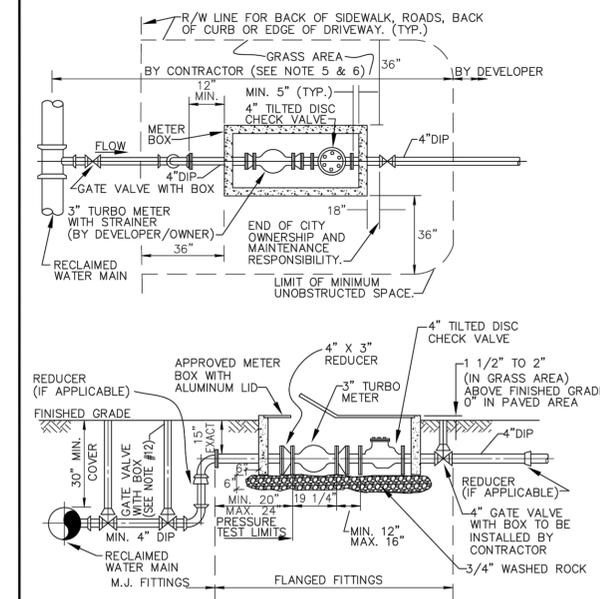
- NOTES:
- 12" MINIMUM CLEARANCE TO BE MAINTAINED BETWEEN METER BOX AND ANY OBSTRUCTION.
  - FOR INSTALLATION OF SERVICES UNDER ROADWAYS A CASING WILL BE USED. PVC SCH 80 OR HDPE SDR 9 PURPLE CASING. CASING TO EXTEND MIN. 5' BEYOND EDGE OF PAVEMENT. END OF CASING TO BE SEALED WITH CEMENT. CASING PIPE I.D. SHALL BE SERVICE O.D. PLUG 1" MINIMUM.
  - METER SHALL NOT BE PLACED IN SIDEWALK OR DRIVEWAY AREAS. SERVICE LINES AND TAPS SHALL NOT BE PLACED UNDER DRIVEWAYS WHENEVER POSSIBLE.
  - DUAL CHECK VALVE IS REQUIRED FOR EVERY RECLAIMED WATER SERVICE. CHECK VALVE SHALL BE PLACED ON DEVELOPER SIDE OF METER.
  - BEDDING (MIN. 4") AND COVER (MIN. 4") OVER SERVICE LINE OR CASING SHALL CONSIST OF FINE GRANULAR MATERIAL. UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS AND LARGER ROCKS SHALL BE REMOVED WITH 2" MAXIMUM SIZE.
  - METER TO BE SET BY CITY.
  - THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR INSTALLATION OF SERVICES BEYOND PRESSURE TEST LIMITS AS SPECIFIED BY THE CITY.
  - PIPING VALVE & BOX TO BE PERMANENTLY IDENTIFIED AS "RECLAIMED WATER SYSTEM."

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL SERVICE CONNECTION 3/4" THROUGH 2" (SHEET 2 OF 2)	DATE: 09-15-2021 RW 1.1
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



- NOTES:
- ALL TYPICAL RECLAIMED WATER SERVICE CONNECTION NOTES AND DETAILS ARE APPLICABLE.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL DOUBLE SERVICE CONNECTION 3/4" THROUGH 2"	DATE: 09-15-2021 RW 2.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	3" METER SERVICE DETAIL (SHEET 1 OF 2)	DATE: 09-15-2021 RW 3.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	

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N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
 CITY OF DELRAY BEACH PROJECT NO. 19-012  
 DELRAY BEACH, PALM BEACH COUNTY, FLORIDA  
 CITY OF DELRAY BEACH DETAILS

SHEET  
**C607**  
 123 OF 223  
 5567.00

ENGINEER'S SEAL  
 STEPHEN CHERRY, PE  
 P.E., LIC. NO. 83268

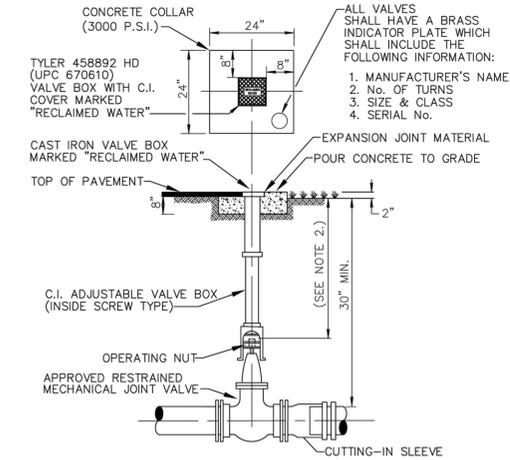
CITY of DELRAY BEACH  
 PUBLIC WORKS DEPARTMENT  
 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
 Phone: (561) 245-7822 Fax: (561) 245-7080 www.delraybeach.com

WGL  
 WGLinc.com  
 561.687.2220  
 2035 VISTA PARKWAY, WEST PALM BEACH, FLORIDA 33411

**NOTES:**

- ALL SERVICE PIPING SHALL BE MINIMUM 4" DIP PRESSURE CLASS 350.
- APPROVED METER BOX TO BE PERMANENTLY INFUSED PURPLE COLOR WITH LID MARKED "RECLAIMED WATER - DO NOT DRINK" AND PAINTED PURPLE.
- ALL FITTINGS SHALL BE MECHANICAL JOINT OR FLANGED WITH RESTRAINED JOINTS.
- PIPING & VALVE TO BE IDENTIFIED AS "RECLAIMED WATER SYSTEM" COMPONENTS.
- METER TO BE PROVIDED, PAID AND INSTALLED BY THE DEVELOPER.
- THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR INSTALLATION OF SERVICES BEYOND PRESSURE TEST LIMITS AS SPECIFIED BY THE CITY.
- CONTRACTOR SHALL CONSTRUCT SERVICE COMPONENTS FOR THE METER TO BE INSTALLED "TRUE" AND "PLUMB".
- METER SHALL NOT BE PLACED IN SIDEWALK OR DRIVEWAY AREAS.
- ALL HARDWARE FOR FLANGED CONNECTIONS (BOLTS ETC.) TO BE 316 STAINLESS STEEL.
- CHECK VALVE TO BE FREE OF OBSTRUCTION FOR PROPER OPERATION.
- A GATE VALVE WITH BOX TO BE LOCATED WITHIN 5 FEET OF METER BOX.

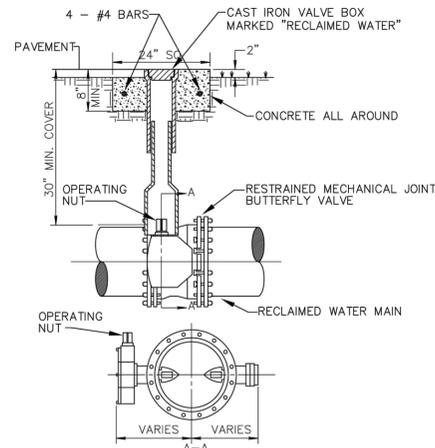
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	3" METER SERVICE DETAIL (SHEET 2 OF 2)	DATE: 09-15-2021 RW 3.1



**NOTES:**

- WHEN OPERATING NUT IS DEEPER THAN 30" AN EXTENSION WILL BE REQUIRED TO BRING OPERATING NUT 24"-30" BELOW FINISHED GRADE. EXTENSION BOLTS & NUTS ARE TO BE 304 STAINLESS STEEL. A HIGH STRENGTH STEEL CENTERING PLATE, WELDED TO THE EXTENSION, IS ALSO REQUIRED.
- VALVE BOXES SHALL HAVE COVERS MARKED "RECLAIMED WATER".
- EXTENSION VALVE BOX TO BE D.I.P. (COLOR: PURPLE)
- A CUT-IN INSTALLATION SHALL REQUIRE RESTRAINED JOINTS THROUGHOUT ASSEMBLY.
- AT DEAD END OR WHERE MAIN LINES CHANGE DIRECTION, VALVES SHALL BE RESTRAINED USING AN APPROVED RESTRAINT METHOD.

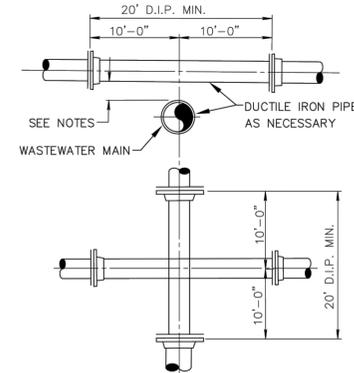
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL: GATE VALVE SETTING AND MAIN CUT-IN DETAIL	DATE: 09-15-2021 RW 6.0



**NOTES:**

- WHEN TOP OF OPERATING NUT IS DEEPER THAN 30" AN EXTENSION WILL BE REQUIRED TO BRING OPERATING NUT 24"-30" BELOW FINISHED GRADE. EXTENSION BOLTS & NUTS ARE TO BE 304 STAINLESS STEEL. A HIGH STRENGTH STEEL CENTERING PLATE, WELDED TO THE EXTENSION, IS ALSO REQUIRED.
- VALVE BOXES SHALL HAVE COVERS MARKED "RECLAIMED WATER".
- A CUT-IN INSTALLATION SHALL REQUIRE RESTRAINED JOINTS THROUGHOUT ASSEMBLY.
- EXTENSION VALVE BOX TO BE D.I.P. (COLOR: PURPLE)
- AT DEAD END OR WHERE MAIN LINES CHANGE DIRECTION VALVES SHALL BE RESTRAINED USING AN APPROVED RESTRAINT METHOD.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL BUTTERFLY VALVE SETTING	DATE: 09-15-2021 RW 7.0



**NOTES:**

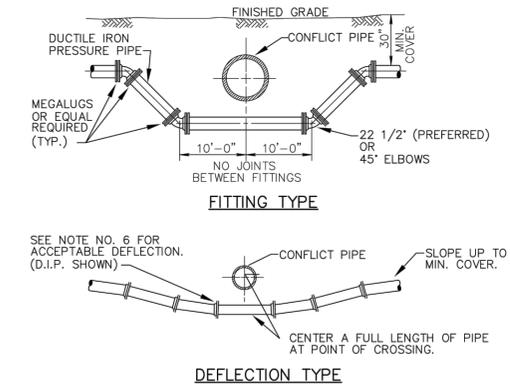
- STORM SEWER, GRAVITY WASTEWATER AND RECLAIMED WATER MAIN CROSSING UNDER POTABLE WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE STORM/WASTEWATER/RECLAIMED WATER PIPE JOINTS AND POTABLE WATER MAIN JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN TEN (10) FEET BETWEEN ANY TWO JOINTS, BOTH PIPES SHALL BE D.I.P., AND THE MINIMUM VERTICAL SEPARATION SHALL BE 6 INCHES. WHERE THERE IS NO ALTERNATIVE TO STORM/WASTEWATER/RECLAIMED WATER PIPES CROSSING OVER A POTABLE WATER MAIN, THE CRITERIA FOR MINIMUM 18" VERTICAL SEPARATION BETWEEN LINES AND JOINT ARRANGEMENT, AS STATED ABOVE, SHALL BE REQUIRED, AND BOTH PIPES SHALL BE D.I.P. IRRESPECTIVE OF SEPARATION. D.I.P. IS NOT REQUIRED FOR STORM SEWERS.
- MAINTAIN MINIMUM TEN (10) FEET HORIZONTAL DISTANCE (WALL TO WALL) BETWEEN POTABLE WATER MAIN AND STORM SEWER, WASTEWATER MAIN, OR FORCE MAIN MAINTAIN MINIMUM THREE (3) FEET HORIZONTAL DISTANCE (WALL TO WALL) BETWEEN RECLAIMED WATER MAIN AND POTABLE WATER MAIN, STORM SEWER, WASTEWATER GRAVITY MAIN OR FORCE MAIN.
- COMPLY WITH PALM BEACH COUNTY HEALTH DEPARTMENT REQUIREMENTS.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	RECLAIMED WATER PIPE SEPARATION (SHEET 1 OF 2)	DATE: 09-15-2021 RW 8.0

**NOTES:**

- FORCE MAIN CROSSING POTABLE WATER MAIN OR RECLAIMED WATER MAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE OUTSIDE OF THE FORCE MAIN AND OUTSIDE OF THE POTABLE WATER MAIN OR RECLAIMED WATER MAIN WITH THE POTABLE WATER MAIN OR RECLAIMED WATER MAIN CROSSING OVER THE FORCE MAIN.
- DO NOT EXCEED 75% OF MANUFACTURERS RECOMMENDED MAXIMUM JOINT DEFLECTION FOR DUCTILE IRON PIPE. PVC PIPE CURVATURE MAY ONLY BE ACCOMPLISHED BY INSTALLING APPROPRIATE BENDS.
- POTABLE WATER SERVICE LINES SHALL CROSS OVER WASTEWATER MAINS WITH MINIMUM 12" VERTICAL SEPARATION. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE WATER SERVICE SHALL BE ENCASED IN A MINIMUM 10' LONG CASING CENTERED OVER THE CROSSING WITH MINIMUM 6" VERTICAL SEPARATION.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	RECLAIMED WATER PIPE SEPARATION (SHEET 2 OF 2)	DATE: 09-15-2021 RW 8.1



**NOTES:**

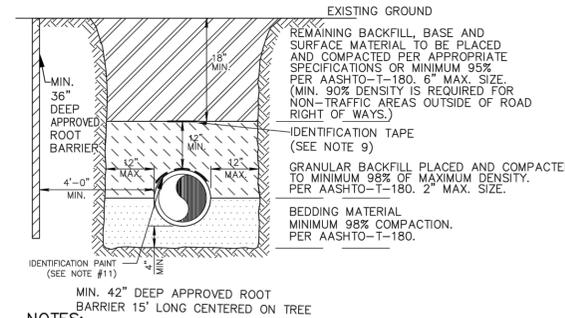
- STORM SEWER, GRAVITY WASTEWATER AND RECLAIMED WATER MAIN CROSSING UNDER POTABLE WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN (18) INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE STORM/WASTEWATER/RECLAIMED WATER PIPE JOINTS AND POTABLE WATER MAIN JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN TEN (10) FEET BETWEEN ANY TWO JOINTS, BOTH PIPES SHALL BE D.I.P., AND THE MINIMUM VERTICAL SEPARATION SHALL BE 6 INCHES. WHERE THERE IS NO ALTERNATIVE TO STORM/WASTEWATER/RECLAIMED WATER PIPES CROSSING OVER A POTABLE WATER MAIN, THE CRITERIA FOR MINIMUM 18" VERTICAL SEPARATION BETWEEN LINES AND JOINT ARRANGEMENT, AS STATED ABOVE, SHALL BE REQUIRED, AND BOTH PIPES SHALL BE D.I.P. IRRESPECTIVE OF SEPARATION. D.I.P. IS NOT REQUIRED FOR STORM SEWERS.
- MAINTAIN MINIMUM TEN (10) FEET HORIZONTAL DISTANCE (WALL TO WALL) BETWEEN POTABLE WATER MAIN AND STORM SEWER, WASTEWATER MAIN, OR FORCE MAIN MAINTAIN MINIMUM THREE (3) FEET HORIZONTAL DISTANCE (WALL TO WALL) BETWEEN RECLAIMED WATER MAIN AND POTABLE WATER MAIN, STORM SEWER, WASTEWATER GRAVITY MAIN OR FORCE MAIN.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	PRESSURE PIPE CONFLICT DETAIL (SHEET 1 OF 2)	DATE: 09-15-2021 RW 9.0

**NOTES:**

- FORCE MAIN CROSSING POTABLE WATER MAIN OR RECLAIMED WATER MAIN SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF TWELVE (12) INCHES BETWEEN THE OUTSIDE OF THE FORCE MAIN AND OUTSIDE OF THE POTABLE WATER MAIN OR RECLAIMED WATER MAIN WITH THE POTABLE WATER MAIN OR RECLAIMED WATER MAIN CROSSING OVER THE FORCE MAIN.
- FITTINGS SHALL BE RESTRAINED WITH AN APPROVED RESTRAINT METHOD.
- THE DEFLECTION TYPE CROSSING IS PREFERRED.
- DO NOT EXCEED 75% OF MANUFACTURERS RECOMMENDED MAXIMUM JOINT DEFLECTION FOR DUCTILE IRON PIPE. PVC PIPE CURVATURE MAY ONLY BE ACCOMPLISHED BY INSTALLING APPROPRIATE BENDS.
- ALL EXPOSED TIE STEEL SHALL BE COATED WITH COAL-TAR EPOXY
- POTABLE WATER SERVICE LINES SHALL CROSS OVER WASTEWATER MAINS WITH MINIMUM 12" VERTICAL SEPARATION. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE WATER SERVICE SHALL BE ENCASED IN A MINIMUM 10' LONG CASING CENTERED OVER THE CROSSING WITH MINIMUM 6" VERTICAL SEPARATION.

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	PRESSURE PIPE CONFLICT DETAIL (SHEET 2 OF 2)	DATE: 09-15-2021 RW 9.1



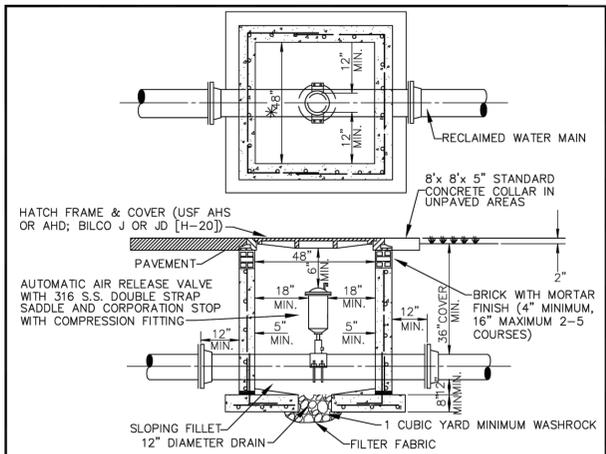
**NOTES:**

- BEDDING SHALL CONSIST OF IN-SITU GRANULAR MATERIAL OR WASHED AND GRADED LIMEROCK 3/8" - 7/8" SIZING UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS AND LARGER ROCKS SHALL BE REMOVED.
- THE PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER THE PIPE HAUNCHES.
- THE PIPE SHALL BE PLACED IN A DRY TRENCH.
- BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK AND DEBRIS.
- DENSITY TESTS ARE REQUIRED IN 1 FOOT LIFTS ABOVE THE PIPE AT INTERVALS OF 400' MAXIMUM, MINIMUM 1 SET OF TESTS FOR EACH WASTEWATER GRAVITY MAIN RUN, OR AS DIRECTED BY THE INSPECTOR AND PAID FOR BY THE CONTRACTOR.
- THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL TRENCH SAFETY LAWS AND REGULATIONS.
- SEE SEPARATE DETAIL FOR "PIPE INSTALLATION UNDER EXISTING PAVEMENT - OPEN CUT."
- THE AFFECTED AREA SHALL BE RESTORED TO EQUAL OR BETTER CONDITION OR AS SPECIFIED IN PERMIT/CONTRACT DOCUMENTS.
- APPROVED MAGNETIC TAPE IS REQUIRED FOR: PVC RECLAIMED WATER MAINS. THE TAPE SHALL BE INSTALLED MAXIMUM 24" BELOW FINISHED GRADE.
- ROOT BARRIER IS REQUIRED FOR APPROVED TREE INSTALLATION CLOSER THAN 10 FEET FROM UTILITY FACILITIES.
- CONTINUOUS 4" WIDE PAINT STRIPING IS REQUIRED FOR RECLAIMED WATER MAINS (PURPLE).

<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	TYPICAL TRENCH/ROOT BARRIER INSTALLATION DETAIL	DATE: 09-15-2021 RW 11.0



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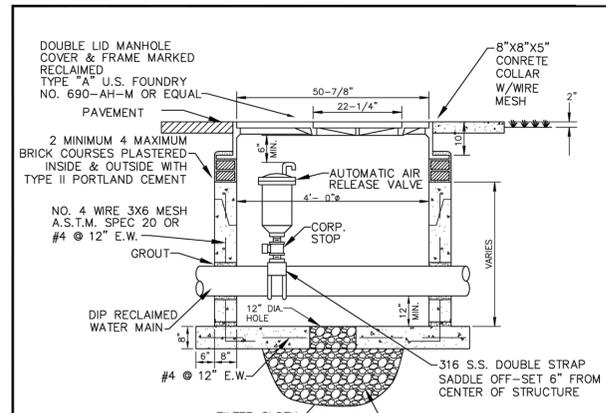


- NOTES:**
- 4000 P.S.I. AT 28 DAYS, TYPE II CONCRETE
  - VAULT SHALL BE PRECAST WITH STEEL REINFORCING.
  - AIR RELEASE VALVE SHALL BE TYPE AND SIZE APPROPRIATE FOR SERVICE INTENDED.
  - ALL OPENINGS SHALL BE SEALED WITH WATERPROOF NON-SHRINKING GROUT.
  - OTHER VAULT AND COVER DESIGNS MAY BE USED UPON SUBMITTAL AND APPROVAL OF SHOP DRAWINGS.
  - AIR RELEASE VALVE AND PIPING TO BE IDENTIFIED AS "RECLAIMED WATER".
  - TWO PIECE STRUCTURE WITH JOINT AT BASE IS PERMITTED.
  - DUCTILE IRON PIPE IS REQUIRED THROUGH THE VAULT. NO PIPE JOINTS ARE ALLOWED IN VAULT.
  - THREADED AREAS OF CORPORATION STOP SHALL BE COMPLETELY SPIRAL WRAPPED WITH TWO WRAPS OF TEFLON TAPE.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

UNDERGROUND AIR RELEASE VALVE & VAULT IN NON TRAFFIC AREAS OUTSIDE OF ROAD RIGHT-OF-WAY

DATE: 09-15-2021  
RW 14.0



- NOTES:**
- PRECAST CONCRETE TYPE II, 4000 P.S.I. AT 28 DAYS.
  - ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
  - LIFT HOLES ARE PERMITTED AND SHALL BE FILLED AFTER INSTALLATION.
  - ALL PIPE HOLES SHALL BE PRECAST OR CORE-DRILLED.
  - MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH A.S.T.M. C-478 LATEST STANDARD.
  - CONCRETE COLLAR REQUIRED WHEN MANHOLE IS OUTSIDE PAVEMENT, SEE DETAIL.
  - AIR RELEASE VALVE SHALL BE TYPE AND SIZE APPROPRIATE FOR SERVICE INTENDED.
  - AIR RELEASE VALVE AND PIPING TO BE IDENTIFIED AS RECLAIMED.
  - TWO PIECE MANHOLE WITH JOINT AT BASE IS PERMITTED. NO PIPE JOINTS INSIDE MANHOLE.
  - DUCTILE IRON PIPE IS REQUIRED THROUGH THE VAULT.
  - THREADED AREAS OF CORPORATION STOP SHALL BE COMPLETELY SPIRAL WRAPPED WITH TWO WRAPS OF TEFLON TAPE.
  - CORPORATION STOP TO BE SELECTED FROM THE STANDARD PRODUCT LIST.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

AIR RELEASE VALVE AND MANHOLE IN PAVED AREA AND ROAD RIGHT-OF-WAY

DATE: 09-15-2021  
RW 15.0

MAXIMUM QUANTITY OF WATER (GALLONS PER HOUR) THAT MAY BE SUPPLIED TO MAINTAIN PRESSURE WITHIN 5 P.S.I. OF THE SPECIFIED TEST PRESSURE. (MECHANICAL OR PUSH-ON JOINT, 18 FT. NOMINAL LENGTHS, PER 1000 FT. OF PIPE)

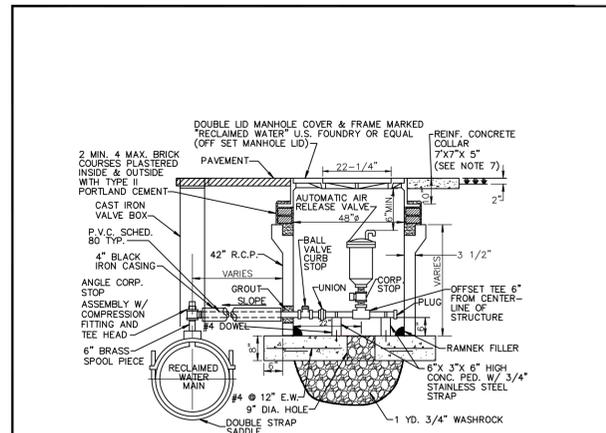
AVG. TEST PRESSURE (PSI)	2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
150	0.10	0.14	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.83	0.92	1.10	1.38	1.65	1.93	2.20
200	0.10	0.15	0.21	0.31	0.42	0.53	0.64	0.74	0.84	0.95	1.06	1.27	1.59	1.91	2.22	2.54

- NOTES:**
- TO OBTAIN THE MAXIMUM QUANTITY OF WATER FOR PIPE WITH 20 FT. NOMINAL LENGTHS, MULTIPLY THE QUANTITY CALCULATED FROM THE TABLE BY 0.9
  - THE MAXIMUM QUANTITY OF ADDED WATER FOR A PIPELINE IS CALCULATED BY MULTIPLYING THE QUANTITY PER HOUR AS OBTAINED FROM THE ABOVE TABLE, BY THE DURATION OF THE TEST IN HOURS, AND BY THE TOTAL LENGTH OF THE LINE BEING TESTED DIVIDED BY 1,000. IF THE LINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE MAXIMUM QUANTITY ADDED WILL BE THE SUM OF THE COMPUTED QUANTITIES FOR EACH SIZE.
  - MAXIMUM TEST LENGTH = 2,500 FEET PER SECTION.
  - THIS STANDARD SHALL REFLECT ANY REVISION OF A.W.W.A. C-600. HOWEVER, THE MAXIMUM QUANTITY OF WATER ADDED SHALL NOT EXCEED 50% OF THE RECOMMENDED LIMIT PER APPLICABLE AWWA C-600 STANDARD.
  - STANDARD TEST PRESSURE = 150 P.S.I.
  - FORMULA BASIS:  $L = \frac{(S) \times (D) \times (P)}{133,200} \times \frac{1}{2} \times \frac{1}{2}$   
L = MAXIMUM QUANTITY OF WATER TO BE ADDED (GALLONS PER HOUR)  
S = LENGTH OF PIPE TESTED (FEET)  
D = DIAMETER OF PIPE (INCHES)  
P = TEST PRESSURE (P.S.I.)
  - PRESSURE TEST DURATION TO BE MINIMUM 2 HOURS.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PRESSURE TEST CRITERIA

DATE: 09-15-2021  
RW 16.0



- NOTES:**
- ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
  - ALL PIPE HOLES SHALL BE PRECAST.
  - PAINT OUTSIDE WITH 2 COATS OF APPROVED PROTECTIVE COATING (MIN. 10 MIL PER COAT D.F.T.)
  - ARV, TAP AND PIPING TO BE TYPE AND SIZE APPROPRIATE FOR SERVICE INTENDED.
  - CONCRETE COLLAR REQUIRED.
  - PIPING AND STRUCTURE TO BE IDENTIFIED AS "RECLAIMED WATER SYSTEM" COMPONENTS.
  - THREADED AREAS OF CORPORATION STOP AND OTHER FITTINGS SHALL BE SPIRAL WRAPPED WITH TWO WRAPS OF TEFLON TAPE.
  - CORPORATION STOP TO BE SELECTED FROM THE STANDARD PRODUCT LIST.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

OFF-SET UNDERGROUND AIR RELEASE VALVE

DATE: 09-15-2021  
RW 17.0

**DENSITY PROCEDURES:**

THE BACKFILL FOR THE FIRST AND SECOND STAGES SHALL BE PLACED IN 6" LAYERS (COMPACTED THICKNESS) AND SHALL BE COMPACTED TO 100% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99.

THE CONTRACTOR SHALL PROVIDE ADEQUATE COMPACTED FILL BENEATH THE HAUNCHES OF THE PIPE, USING MECHANICAL TAMPERS SUITABLE FOR THIS PURPOSE. THIS COMPACTION APPLIES TO THE MATERIAL PLACED BENEATH THE HAUNCHES OF THE PIPE AND ABOVE ANY BEDDING REQUIRED.

THE CONTRACTOR SHALL OBTAIN A WELL COMPACTED BED AND FILL ALONG THE SIDES OF THE PIPE AND TO A POINT INDICATING THE TOP OF SUB-GRADE MATERIAL.

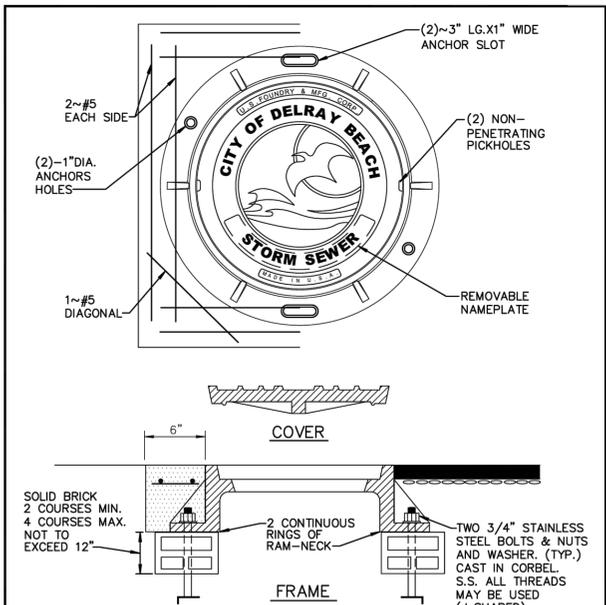
**GENERAL NOTES:**

- SEE NOTES FOR TYPICAL TRENCH DETAIL FOR BACKFILL AND BEDDING MATERIAL SPECIFICATIONS.
- BASE MATERIAL SHALL BE PLACED IN 6" LAYERS AND EACH LAYER COMPACTED TO MAXIMUM DENSITY PER AASHTO T-180.
- ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED (BUTT JOINTS ONLY).
- SURFACE MATERIAL WILL BE CONSISTENT WITH THE EXISTING SURFACE. THE AFFECTED AREA SHALL BE RESTORED TO EQUAL OR BETTER CONDITION.
- THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE REGARDING ANY ADDITIONAL SPECIFICATIONS AS REQUIRED BY THE PROPERTY OWNER. (FDOT, COUNTY, CITY, ETC.)
- EXCAVATABLE "FLOWABLE FILL" WITH ULTIMATE COMPRESSIVE STRENGTH BETWEEN 50 AND 150 PSI MAY BE USED TO SUBSTITUTE FOR THE BACKFILL AND BASE MATERIALS.
- PAVEMENT OVERLAY ON BOTH SIDES OF THE CUT MAY BE REQUIRED PER OWNER SPECIFICATION.
- MAGNETIC TAPE IS REQUIRED FOR ALL PVC/HDPE RECLAIMED WATER MAINS. (SEE TRENCHING DETAIL FOR INSTALLATION INSTRUCTIONS).
- THE CONTRACTOR SHALL BE COMPLIANT WITH APPLICABLE TRENCH SAFETY REGULATIONS (OSHA, ETC.)

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PIPE INSTALLATION UNDER EXISTING PAVEMENT - OPEN CUT

DATE: 09-15-2021  
RW 18.0

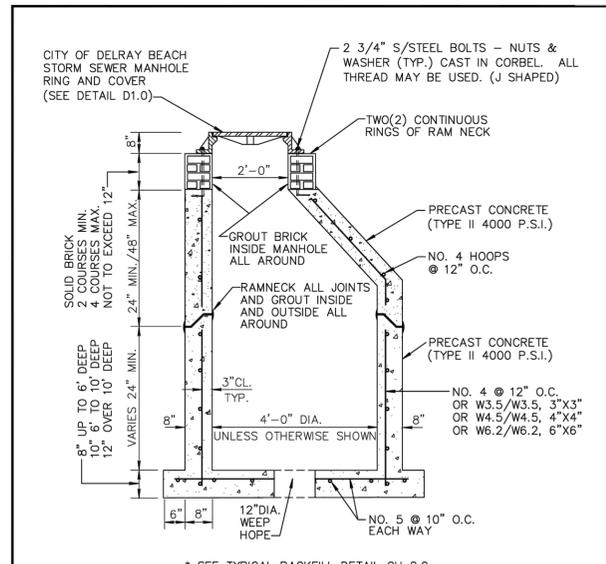


- NOTES:**
- COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.
  - FRAME AND COVER SHALL BE U.S. FOUNDRY MR-ORS AND RING SHALL BE USF 576
  - MANHOLE ADJUSTING RINGS SHALL BE CAST IRON, USF TYPE B.
  - CITY LOGO LID TO BE USED ON CITY MAINTAINED STORM SEWER ONLY. STANDARD NO. 576BH IS TO BE USED ON PRIVATELY MAINTAINED STORM SEWER.

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

STORM SEWER MANHOLE FRAME & COVER

DATE: 09-15-2021  
D 1.0



- NOTES:**
- FOR PIPES UP TO 36" R.C.P.
  - 12" DIA. WEEP HOLE REQUIRED ON ALL STRUCTURES WHICH HAVE BOTTOM ELEVATIONS ABOVE THE WATER TABLE. HARDWARE CLOTH SHALL BE PROVIDED ABOVE BEDDING ROCK AND UNDER WEEP HOLE. EXCEPT IN WELL FIELDS.
  - 18" SUMP REQUIRED ON ALL STRUCTURES.
  - IF THE STRUCTURE IS INSTALLED IN WATER TABLE MUST HAVE BEDDING. (SEE DETAIL BEDDING D 4.0)

**CITY of DELRAY BEACH**  
PUBLIC WORKS DEPARTMENT  
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

STORM SEWER MANHOLE

DATE: 09-15-2021  
D 2.0

REVISION A - 3/25/24

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PUBLIC WORKS DEPARTMENT  
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Phone (561) 245-7822 Fax (561) 245-7080 www.delraybeach.com

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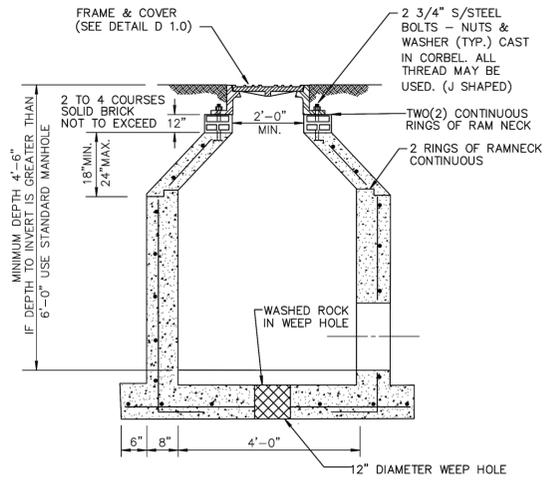
ENGINEER'S SEAL

STEPHEN CHERRY, PE  
P.E., LIC. NO. 83268

N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA

CITY OF DELRAY BEACH DETAILS

SHEET  
C609  
125 OF 223  
5567.00



\* SEE TYPICAL BACKFILL DETAIL GU 2.0

**NOTE:**

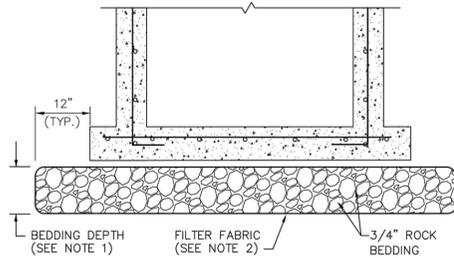
1. ALL STANDARD MANHOLE NOTES AND DETAILS ARE APPLICABLE. (SEE DETAIL D 2.0)
2. IF THE STRUCTURE IS INSTALLED IN WATER TABLE MUST HAVE BEDDING. (SEE DETAIL BEDDING D 4.0)

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

SHALLOW MANHOLE

DATE: 09-15-2021

D 3.0



**NOTES:**

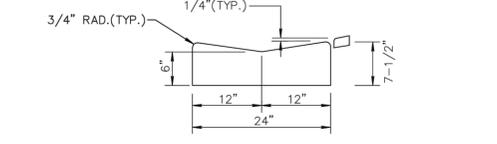
1. BEDDING DEPTH SHALL BE 10" UNDER DRAINAGE STRUCTURES AND 18" UNDER SANITARY STRUCTURES.
2. ROCK SHALL BE WRAPPED IN FILTER FABRIC THAT MEETS THE REQUIREMENTS OF F.D.O.T. SPECIFICATION SECTION 985.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

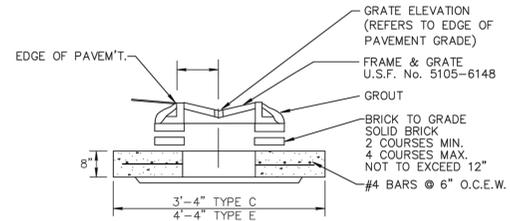
STANDARD BEDDING DETAIL

DATE: 09-15-2021

D 4.0



2' VALLEY CURB  
NOT TO SCALE



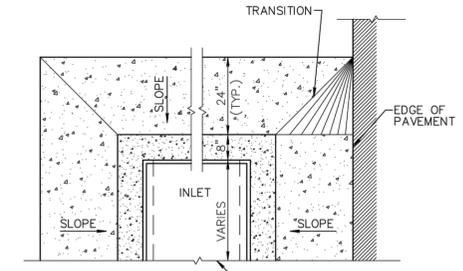
VALLEY GUTTER FRAME & GRATE  
NOT TO SCALE

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

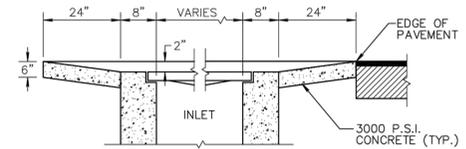
TYPE C & E INLET VALLEY GUTTER & GRATE DETAILS

DATE: 09-15-2021

D 5.0



HALF PLAN



SECTION

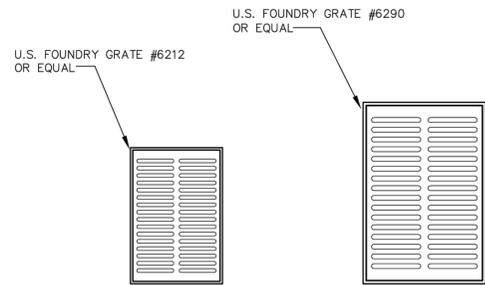
CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

INLET APRON DETAIL

DATE: 09-15-2021

D7.0

INLET TYPE	DIMENSIONS		GRATE TYPE	MAX. PIPE SIZE	
	A	B		WALL A	WALL B
'c'	2'-0"	3'-1"	U.S. FOUNDRY No. 6212	15" R.C.P.	24" R.C.P.
'e'	3'-0"	4'-5"	U.S. FOUNDRY No. 6290	24" R.C.P.	36" R.C.P.



TYPE "C"

TYPE "E"

**NOTES:**

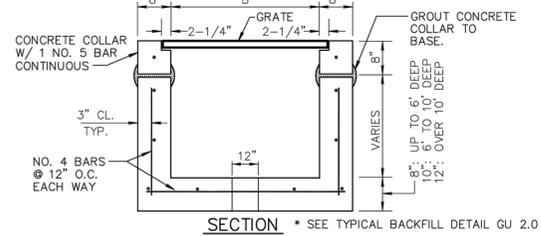
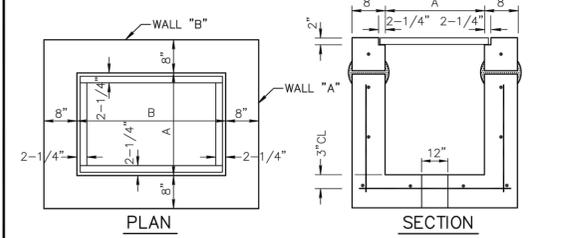
1. ALL GRATES SHALL BE SUITABLE FOR H-20 LOADING (HIGHWAY TRAFFIC LOADS)
2. WHEN INSTALLED IN PAVEMENT OR WITHIN 6' OF PAVEMENT USE U.S.F. 4160-6210

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPE C & E INLET GRATE DETAIL

DATE: 09-15-2021

D8.0



INLET TYPE	DIMENSIONS		GRATE TYPE	MAX. PIPE SIZE	
	A	B		WALL A	WALL B
'c'	2'0"	3'1"	U.S. FOUNDRY No. 6212	15" R.C.P.	24" R.C.P.
'e'	3'0"	4'6"	U.S. FOUNDRY No. 6290	24" R.C.P.	36" R.C.P.

**NOTES:**

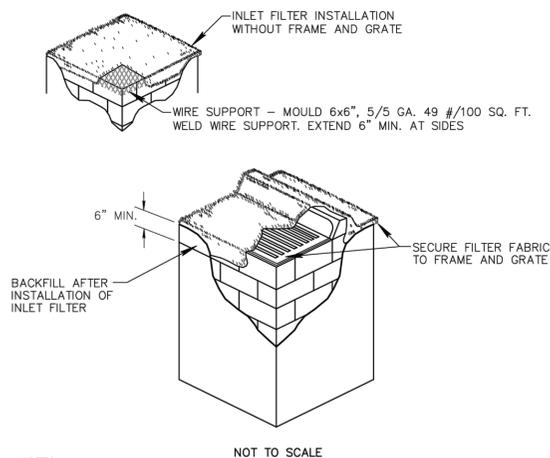
1. INLET TO BE PRECAST WITH CLASS 'A' 4000 P.S.I. CONCRETE.
2. ALL EXPOSED CORNERS AND EDGES TO BE CHAMFERED 3/4".
3. 12" DIAMETER WEEP HOLE REQUIRED ON ALL STRUCTURES WHICH HAVE A BOTTOM ELEVATION ABOVE THE WATER TABLE EXCEPT IN WELLFIELDS.
4. 18" SUMP REQUIRED IN ALL DRAINAGE STRUCTURES.
5. SEE BEDDING DETAIL D 3.0
6. ALL STRUCTURES TO BE 4 SIDED ANGLE SHOULDERS.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPE C & E INLET DETAIL

DATE: 09-15-2021

D9.0



**NOTES:**

1. CONTRACTOR IS TO CLEAN INLET FILTER AFTER EVERY STORM.
2. CONTRACTOR TO REMOVE FABRIC JUST PRIOR TO PAVING.

A SEDIMENT TRAP WILL BE EXCAVATED BEHIND THE CURB AT THE INLET. THE BASIN SHALL BE AT LEAST 12 TO 14 INCHES IN DEPTH, APPROXIMATELY 36 INCHES IN WIDTH, AND APPROXIMATELY 7 TO 10 FEET IN LENGTH PARALLEL TO THE CURB.

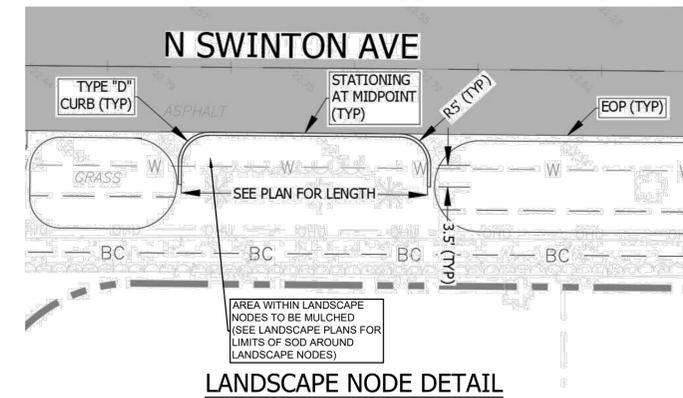
STORM WATER WILL REACH THE SEDIMENT TRAP VIA CURB CUTS ADJACENT TO EACH SIDE OF THE INLET STRUCTURE. THESE OPENINGS SHALL BE AT LEAST 12 INCHES IN LENGTH. STORM WATER MAY ALSO REACH THE BASIN VIA OVERLAND FLOW LAND AREA BEHIND THE CURB. THE CURB CUTS SHALL BE REPAIRED WHEN THE SEDIMENT TRAP IS REMOVED.

CITY of DELRAY BEACH PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

INLET FILTER DETAIL

DATE: 09-15-2021

D10.0



LANDSCAPE NODE DETAIL

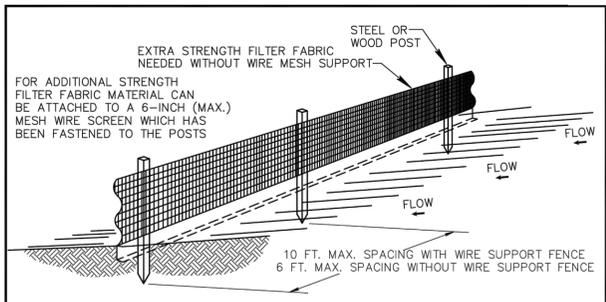


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STEPHEN CHERRY, PE P.E., LIC. NO. 83268

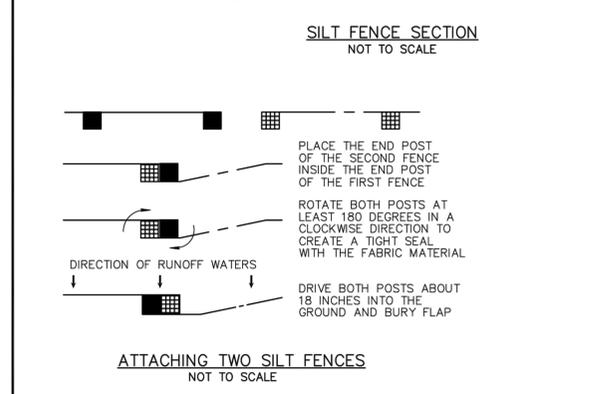
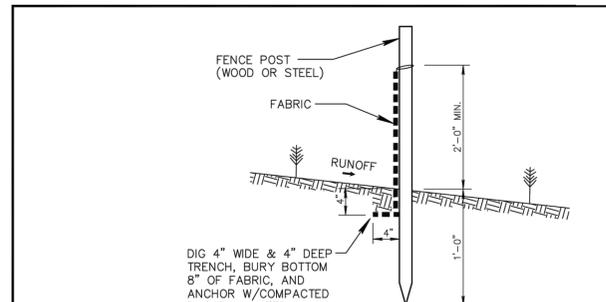
N SWINTON AVE ROADWAY & UTILITY IMPROVEMENTS  
CITY OF DELRAY BEACH PROJECT NO. 19-012  
DELRAY BEACH, PALM BEACH COUNTY, FLORIDA  
CITY OF DELRAY BEACH DETAILS



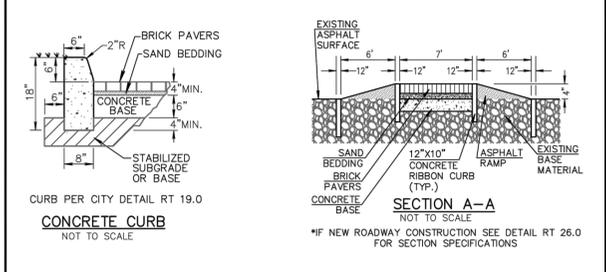
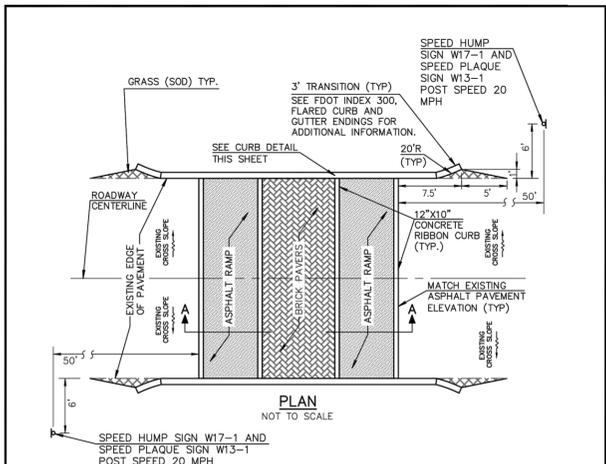


- NOTES:**
1. THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES.
  2. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS.
  3. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES. WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 6 FEET.
  4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
  5. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES, OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
  6. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 8 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
  7. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
  8. ALL PROJECTS REQUIRE SUBMITTAL OF POLLUTION PREVENTION PLAN (PPP).
  9. ALL PROJECTS 1 AC. OR MORE MUST SUBMIT NOTICE OF INTENT (NOI) TO FDP.

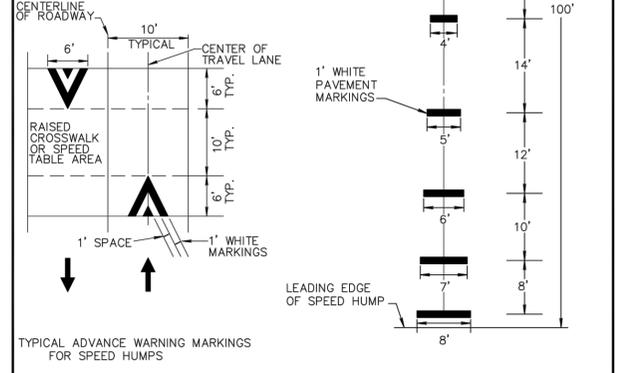
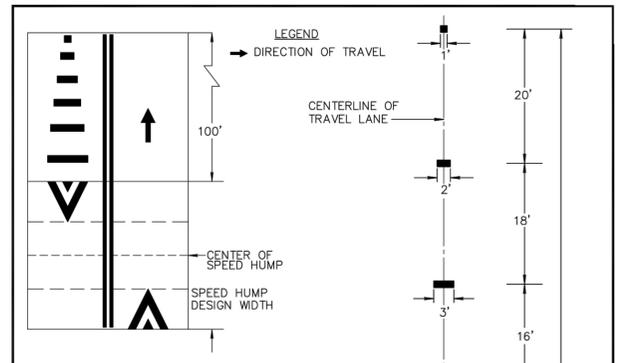
<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SILT FENCE INSTALLATION DETAIL (SHEET 1 OF 2)	DATE: 09-15-2021 D12.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SILT FENCE INSTALLATION DETAIL (SHEET 2 OF 2)	DATE: 09-15-2021 D 12.1
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SPEED HUMP / TABLE DETAIL	DATE: 09-15-2021 RT 12.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	



<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	SPEED HUMP PAVEMENT MARKING DETAIL	DATE: 09-15-2021 RT 13.0
	<b>CITY of DELRAY BEACH</b> PUBLIC WORKS DEPARTMENT 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444	

**CITY of DELRAY BEACH**  
 PUBLIC WORKS DEPARTMENT  
 434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444  
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 CITY OF DELRAY BEACH PROJECT NO. 19-012  
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 CITY OF DELRAY BEACH DETAILS

SHEET  
**C611**  
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 5567.00

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CADD: 11/15/2021 1:50 PM  
 PLOT DATE: 12/26/2023 7:51 AM  
 DRAWING: P:\2023\19-012\19-012\_Swinton Avenue Roadway and Utility Improvements\Drawings\DWG\DETAILS.dwg