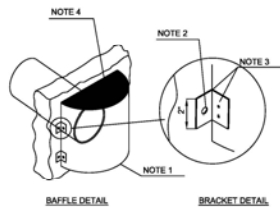
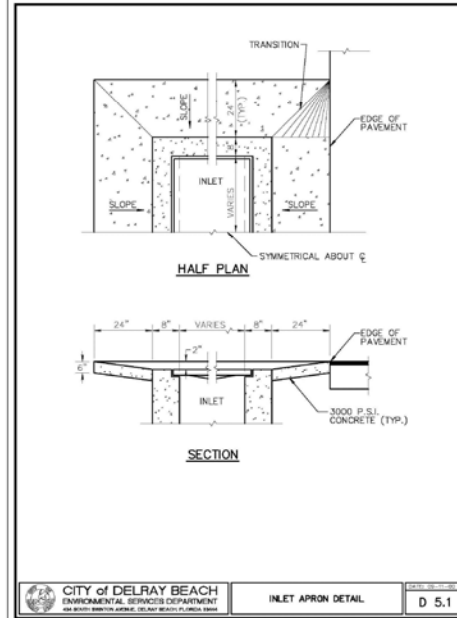
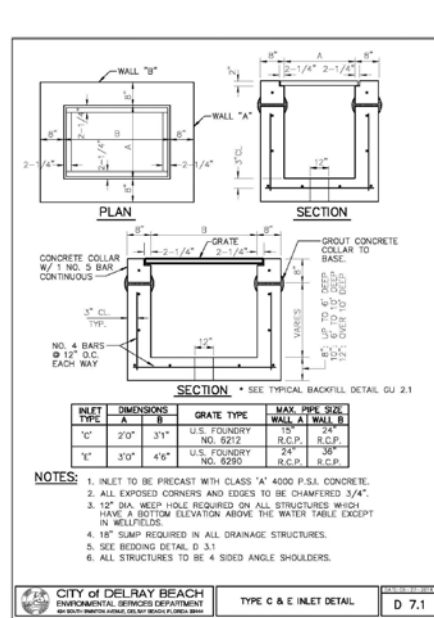
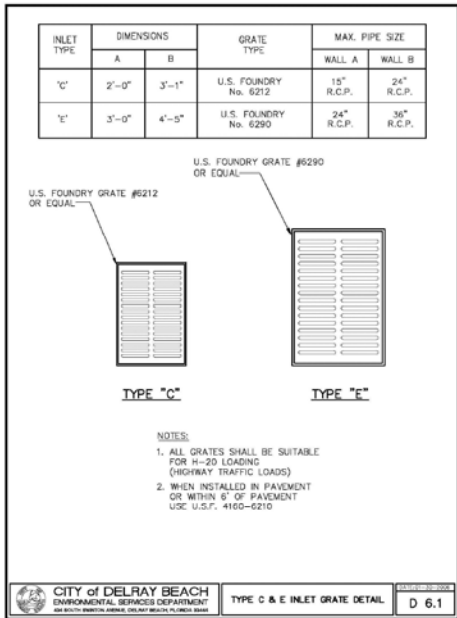
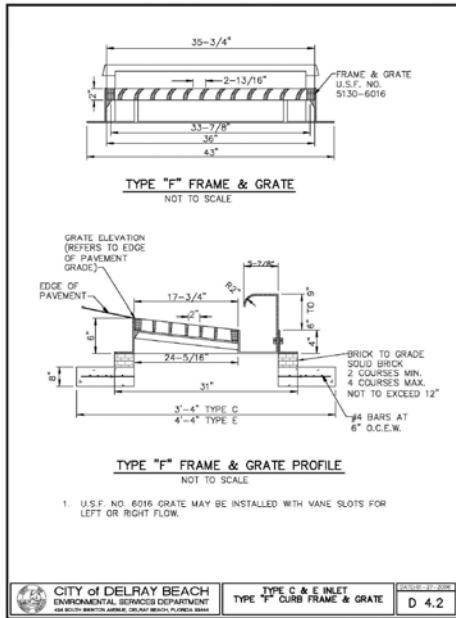


1. PERMITTEE WILL COORDINATE (I.E. PRE-CONSTRUCTION MEETINGS, INSPECTIONS, FINAL ACCEPTANCE OF WORK, ETC.) WITH DAVID MOORE OF FERROVAL SERVICES, INC. @ 954-317-8044 OR EMAIL: DAVID.MOORE@FERROVALSERVICES.COM.
EQUIPMENTATION WILL INCLUDE A PRE-CONSTRUCTION MEETING, CERTIFICATION ACCEPTANCE AND FINAL APPROVAL IS CONTINGENT UPON CONFORMITY OF ALL WORK COMPLETED ACCORDING TO THIS PERMIT AND THE RESTORATION OF THE RIGHT OF WAY.
2. THIS PERMIT IS VALID ONLY FOR WORK PROPOSED WITHIN THE D.O.T. RIGHT-OF-WAY. CERTIFICATION ACCEPTANCE AND FINAL APPROVAL IS CONTINGENT UPON CONFORMITY OF ALL WORK COMPLETED ACCORDING TO THIS PERMIT AND RESTORATION OF THE RIGHT-OF-WAY.
3. ALL MATERIALS AND CONSTRUCTION WITHIN THE FLORIDA DEPARTMENT OF TRANSPORTATION DESIGN (F.D.O.T.) RIGHT-OF-WAY SHALL CONFORM TO THE "LATEST VERSION OF FDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION AND LATEST VERSION OF THE STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION".
4. ALL MAINTENANCE OF TRAFFIC M.O.T. FOR THIS PROJECT WILL BE IN COMPLIANCE WITH THE DEPARTMENTS CURRENT EDITION OF THE FOOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION INDICES, (102-600 SERIES) AND THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). THE OPERATIONS ENGINEER OR HIS DESIGNEE RESERVES THE RIGHT TO DIRECT THE REMOVAL/RELOCATION/MODIFICATION OF ANY TRAFFIC DEVICES(S) AT THE PERMITTEES SOLE EXPENSE. SPECIAL ATTENTION WILL BE GIVEN TO INDICES 102-411, 102-412, 102-413, AND 102-460.
5. ALL THERMOPLASTIC TRAFFIC STRIPES, MARKINGS AND SIGNAGE WILL BE INSTALLED PER THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS
6. FOR ANY UNDERGROUND WORK, THE CONTRACTOR MUST CONTACT SIGNAL TRAFFIC CONTROL MAINTAINING AGENCY PRIOR TO CONSTRUCTION.
7. IT IS THE PERMITTEES RESPONSIBILITY TO OBTAIN FINAL ACCEPTANCE OF PERMITTED WORK (COMPLETED) AND THE RESTORATION OF THE RIGHT-OF-WAY FROM THE F.D.O.T. PRIOR TO USAGE.
8. PERMITTEE WILL PROVIDE THE NECESSARY DENSITIES IN ACCORDANCE WITH SECTION 125-8 OF THE FOOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION) PRIOR TO FINAL ACCEPTANCE BY THE F.D.O.T.
9. DURING THE REMOVAL/INSTALLATION OF ANY CURB AND GUTTER SECTION, THE PERMITTEE WILL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE ABUTTING ADJACENT. THE DAMAGED AREA MUST BE REPAIR WILL BE IN ACCORDANCE WITH THE CURRENT SPECIFICATION AND/OR AS DIRECTED BY THE RESIDENT OPERATIONS ENGINEER.
10. ALL PUBLIC SIDEWALK CURB RAMPS WILL MEET THE STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION (CURRENT EDITION) INDEX NO. 522-002 CURBRAMP INSPECTIONS REQUIRED PRIOR TO INSTALLATION OF CONCRETE.
11. PERMITTEE SHALL PROVIDE THE PRODUCERS CERTIFICATION (DELIVERY TICKET) FOR THE NS CONCRETE-2500 PSI (USED FOR SIDEWALK, CURB & GUTTER, DITCH PAVEMENT AND TRAFFIC SEPARATOR) PRIOR TO FINAL ACCEPTANCE BY THE DEPARTMENT. THE DELIVERY TICKET SHALL CERTIFY THE CONCRETE WAS PROPERLY DELIVERED AND ACCEPTED IN ACCORDANCE WITH SECTION 547 OF THE F.D.O.T.'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (CURRENT EDITION).
12. REMOVAL/INSTALLATION OF SIDEWALK WILL BE IN ACCORDANCE WITH STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION INDEX 522-001
13. SOODED AREAS WILL BE IN ACCORDANCE WITH FDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION INDEX X70-610 AND SECTIONS 162.981, 682, 987 OF THE F.D.O.T.'S STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. ALL DISTURBED AREAS WILL BE SOODED WITHIN (1) WEEK OF INSTALLATION OF SMOI PERMITTED WORK.
14. RESTRICTED HOURS OF OPERATION FOR LANE CLOSURES WILL BE FROM 9:00AM TO 4:00PM, (MONDAY-FRIDAY), UNLESS OTHERWISE APPROVED BY THE OPERATIONS ENGINEER OR DESIGNEE. NOT SHALL BE PICKED UP BY 4:00PM AND NOT START BEFORE 9:00AM

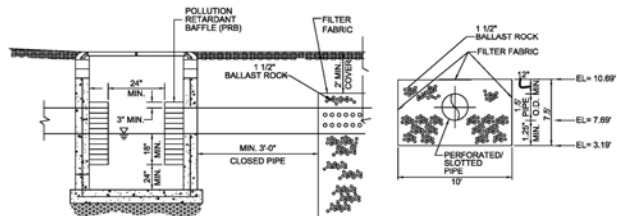
STRUCTURE #	GRATE/INLET TYPE	BOT. STR. TYPE	RM	N INVERT	E INVERT	S INVERT	W INVERT
1-2	TYPE "C"	TYPE "C"	15.10	7.89	11.57		
1-3	TYPE "C"	TYPE "C"	15.10	7.89	11.57	7.89	
1-3	TYPE "C"	TYPE "C"	15.16		7.89 ⑤	7.89 ⑥	
1-4	TYPE "C"	TYPE "C"	15.10				7.89 ⑥
1-5	TYPE "C"	TYPE "C"	15.30			7.89 ⑥	7.89 ⑥
1-6	TYPE "C"	TYPE "C"	15.30	7.89 ⑤		7.89	10.64
1-7	TYPE "C"	TYPE "C"	15.10	7.89			
1-8	TYPE "C"	TYPE "C"	14.88				
M-1	MANHOLE		15.35	7.85 ⑤	7.89 ⑤	7.89	
M-2	MANHOLE		15.90		7.89 ⑤	7.59	7.85 ⑤



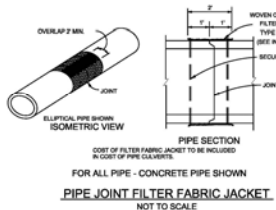
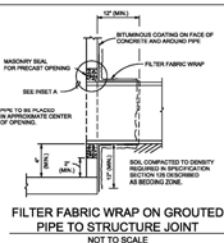


NOTES:
1) BAFFLE SHALL BE C.A.P. SECTION (OUTRILL DIAMETER PLUS 1")
2) 10" X 60 WEDGE ANCHORS (S.A.T. ALLOW 8000 L.B.T. BEAR 8000)
3) WELDS ON 3/8" THRU BOLTS
4) BOLTED TO WALL WITH TOP GAPPED (WATER TIGHT)

POLLUTANT RETARDANT BAFFLE
NOT TO SCALE



EXFILTRATION TRENCH
NOT TO SCALE



Bowman Consulting
C O N S U L T I N G
Certificate of Authorization License No. 30482

Bowman Consulting Group, Ltd.
13450 W. Sunrise Blvd.,
Suite 300
Buckeye, FL 33323
Phone: (954) 314-6470
www.bowmanconsulting.com
© Bowman Consulting Group, Ltd.

CHEVROLET - DELRAY BEACH
2605 SOUTH FEDERAL HIGHWAY
DELRAY BEACH, FLORIDA 33443
CITY OF DELRAY BEACH

DRAINAGE DETAILS

WILLIAM PEPPER, P.E.
LICENSE NO. 72085
01/31/2019
PLAN REVISIONS

DATE	DESCRIPTION
01/31/2019	EL DESIGN
01/31/2019	RM DRAWING
01/31/2019	CHKD

SCALE

JOB NO. 010463-01-002

DATE 01/31/2019

FILE 07-010463-01-002-001.dwg

C-12

SHEET



CONTECH
CMP DETENTION SYSTEMS

CONTECH
DYODS
(CHINA)

The design and information shown on a website is the proper format for content. Engaged visitors are more likely to stay on the site longer, and they are more likely to convert into sales. Therefore, it is essential to use design and layout to create a website that is visually appealing and easy to use.



CONTECH
CMP DETENTION SYSTEM

CONTECH
DYODS
(continued)

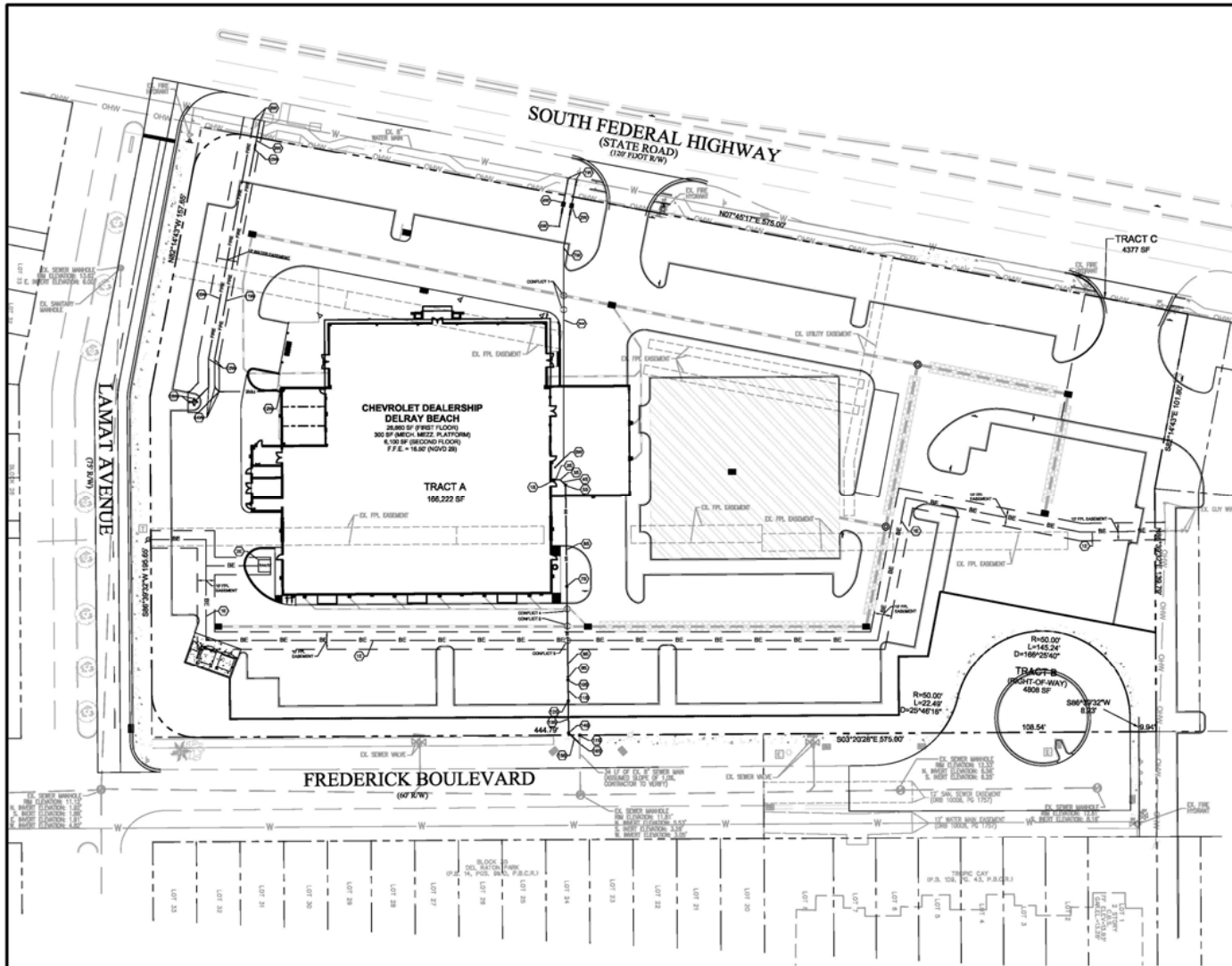


The design and information process is a service to the project design. A consultant Engineering Solutions Inc. is involved, but only part thereof. The company is also involved in the design process. There is a synergy to the design process, especially the design of the building.

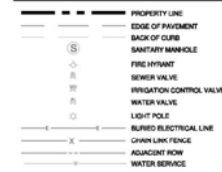


CONTECH
CMP DETENTION SYSTEM

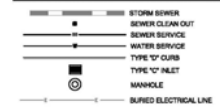
CONTECH
DYODS
(PENDING)



EXISTING LEGEND



PROPOSED LEGEND



PLAN NOTES

WATER SERVICE

1. CONNECT TO EXISTING 8" WATER MAIN WITH TWO (2) 2" TAPPING SLEEVES AND 2" COMP STOP VALVES. CONTRACTOR TO CONFIRM LOCATION, SIZE AND ELEVATION OF EXISTING LINES AT START OF CONSTRUCTION.
2. CONNECT 1" WATER METER AND SAGOLOW PREVENTER.
3. CONNECT 1/2" OF 1" PVC DOMESTIC WATER SERVICE.
4. CONNECT 1" IRRIGATION WATER METER AND SAGOLOW PREVENTER.
5. CONNECT 1" IRRIGATION LINE (REFER TO IRRIGATION PLAN FOR CONTINUATION).
6. CONNECT 1" 40' BEND.
7. CONNECT 1" 11.30' BEND.
8. CONNECT TO EXISTING WATER MAIN WITH TAPPING SLEEVES. CONTRACTOR TO CONFIRM LOCATION, SIZE AND ELEVATION OF EXISTING LINES AT START OF CONSTRUCTION.
9. CONNECT 1/4" OF 8" DP FIRE SERVICE.
10. CONNECT DOUBLE DETECTOR CHECK VALVE (D.D.C.V.).
11. CONNECT 1/2" OF 8" DP FIRE SERVICE.
12. CONNECT 7" FIRE DEPARTMENT CONNECTION (FDC).
13. CONNECT 8" 11.30' BEND.
14. CONNECT 8" 40' BEND.
15. CONNECT 1/8" OF 8" DP FIRE SERVICE.
16. CONNECT FIRE HYDRANT WITH AUTOMATIC FLUSHER.

SANITARY SEWER SERVICE

1. CONNECT SANITARY CLEAN OUT INV. EL. = 13.10'
2. CONNECT 4" OF 4" PVC SANITARY SERVICE @ 1%.
3. CONNECT 8" 40' BEND.
4. CONNECT 4" OF 4" PVC SANITARY SERVICE @ 1%.
5. CONNECT SANITARY CLEAN OUT INV. EL. = 13.07'
6. CONNECT 8" OF 4" PVC SANITARY SERVICE @ 1%.
7. CONNECT SANITARY CLEAN OUT INV. EL. = 13.08'
8. CONNECT 1/4" OF 4" PVC SANITARY SERVICE @ 1%.
9. CONNECT 8" 40' VERTICAL BEND WITH SANITARY CLEAN OUT UPPER INV. EL. = 11.92'
10. CONNECT 1/8" OF 4" PVC SANITARY SERVICE @ 1%.
11. CONNECT 8" 40' VERTICAL BEND WITH SANITARY CLEAN OUT LOWER INV. EL. = 11.98'
12. CONNECT 1/8" OF 4" PVC SANITARY SERVICE @ 1%.
13. CONNECT 8" 40' BEND WITH SANITARY CLEAN OUT INV. EL. = 13.08'
14. CONNECT 8" OF 4" PVC SANITARY SERVICE @ 1%.
15. CONNECT TO EXISTING 8" SEWER MAIN WITH 8"X8" WYE INV. EL. = 13.08'
16. CONNECT SANITARY CLEAN OUT INV. EL. = 13.41'

ELECTRIC SERVICE

1. BURIED ELECTRIC SERVICE TO BE CONSTRUCTED BY OTHERS.
2. TRANSFORMER TO BE CONSTRUCTED BY OTHERS.

CONFLICTS

1. CONFLICT A: WATER TO PASS OVER STORM WITH MINIMUM CLEARANCE OF 12" T.O.P. STORM = 9.30' CLEARANCE = 9.30'
2. CONFLICT B: SANITARY TO PASS OVER STORM 8" P. SANITARY = 12.12' APPROX. T.O.P. STORM = 9.30' CLEARANCE = 9.30'
3. CONFLICT C: ELECTRIC TO PASS OVER SANITARY WITH MINIMUM CLEARANCE OF 12" T.O.P. SANITARY = 11.38'
4. CONFLICT D: SANITARY TO PASS OVER STORM 8" P. SANITARY = 12.12' APPROX. T.O.P. STORM = 11.16' CLEARANCE = 12"

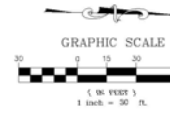
ESTIMATED FLOWS			
FIXTURE	PROPOSED	RATIO	EST. FLOW
WATER CLOSET	6	800 GPD/PCU	4,800 GPD
CARWASH	1	750 GPD/PCU	750 GPD
TOTAL ONLY WATER CONSUMPTION			5,550 GPD

GENERAL UTILITY NOTES

1. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND IS RESPONSIBLE TO REPAIR ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION AT NO COST TO THE OWNER.
2. ALL UTILITIES ARE SHOWN FROM INFORMATION GATHERED AND SHOULD NOT BE USED AS EXACT. CONTRACTOR SHALL VERIFY EXACT DEPTHS AND LOCATIONS PRIOR TO UTILITY INSTALLATION.
3. CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANY FOR INSTALLATION AND SPECIFICATION REQUIREMENTS.
4. ALL PIPE MATERIALS SHALL COMPLY WITH LOCAL REGULATIONS AND STANDARDS.
5. ALL TRENCHING AND BEDDING SHALL BE FOR THE UTILITY TRENCH AND BEDDING DETAIL.
6. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR ALL BUILDING UTILITY TIE INS.
7. THE CONTRACTOR IS TO FIELD VERIFY THE EXACT LOCATIONS AND DEPTHS OF UTILITY LINES. THE CITY OF DELRAY BEACH ENGINEERING DEPARTMENT ASSUMES NO RESPONSIBILITY FOR ANY POTENTIAL CONFLICTS.
8. ANY WATER AND/OR SEWER CONNECTIONS MUST BE COORDINATED AND SUPERVISED BY UTILITY DISTRICT PERSONNEL. PLEASE GIVE 72 HOURS NOTICE FOR CONNECTIONS.
9. EXISTING FORCE MAIN IS TO REMAIN IN SERVICE UNTIL THE NEW FORCE MAIN IS CONSTRUCTED AND CLEARED FOR SERVICE.
10. ANY TREES OR B-HUBS PLACED WITHIN WATER, SEWER, OR DRAINAGE EASEMENTS SHALL CONFORM TO THE CITY OF DELRAY BEACH STANDARD DETAILS, L.D. 1.1 & L.D. 1.2.

UTILITY CONTACTS

SANITARY SEWER: AGENCY: CITY OF DELRAY BEACH PUBLIC UTILITIES ADDRESS: 404 S. BRYANTON AVE. DELRAY BEACH, FL 33444 SCOTT W. SOLOMON (561) 243-7308 solomon@cityofdelraybeach.com		WATER: AGENCY: CITY OF DELRAY BEACH PUBLIC UTILITIES ADDRESS: 404 S. BRYANTON AVE. DELRAY BEACH, FL 33444 SCOTT W. SOLOMON (561) 243-7308 solomon@cityofdelraybeach.com		ELECTRIC: AGENCY: FLORIDA POWER & LIGHT COMPANY ADDRESS: 21405 POWERLINE ROAD BOCA RATON, FL 33433 CHARLES D. O'NEILL (561) 479-4858 Charles.D.O'Neill@flpl.com	
TELEPHONE: AGENCY: AT&T ADDRESS: 801 2ND STREET - 2ND AVE DELRAY BEACH, FL 33489 DANIEL KUSSELL (561) 888-6238 dkus@att.net		TELEPHONE: AGENCY: CITY OF DELRAY BEACH ADDRESS: 135 N.W. 14th AVENUE DELRAY BEACH, FL 33444 WILLIAM KRAMER (561) 243-7428 kramer@cityofdelraybeach.com		TELEPHONE: AGENCY: SOUTH FLORIDA WATER MANAGEMENT DISTRICT ADDRESS: 301 GUN CLUB ROAD WEST PALM BEACH, FL 33408 CARLOS A. DE ROSAS (561) 666-8800 carlos@sfwm.com	
AGENCY: FLORIDA DEPARTMENT OF TRANSPORTATION, DISTRICT FOUR ADDRESS: 2640 WEST COMMERCIAL BLVD FORT LAUDERDALE, FL 33309 GEORGE CULLUMBER (561) 777-2088 gpc@dot.state.fl.us		AGENCY: PALM BEACH COUNTY LAND DEPT. ADDRESS: 2300 NORTH JUDG ROAD WEST PALM BEACH, FL 33411 ROBERT LAZAR (561) 666-4006 rla@pbcgov.org		TRAFFIC ENGINEERING: AGENCY: PALM BEACH COUNTY ADDRESS: 2300 NORTH JUDG ROAD WEST PALM BEACH, FL 33411 SUPERVISOR (561) 233-3800	



Bowman Consulting Group, Ltd.
 13450 W. Sunrise Blvd., Suite 200
 Sunrise, FL 33323
 Phone: (954) 314-6470
 www.bowmanconsulting.com
 Certificate of Authorization License No. 30402

Bowman Consulting Group, Ltd.
 13450 W. Sunrise Blvd., Suite 200
 Sunrise, FL 33323
 Phone: (954) 314-6470
 www.bowmanconsulting.com
 Certificate of Authorization License No. 30402

UTILITY PLAN
CHEVROLET - DELRAY BEACH
 2605 SOUTH FEDERAL HIGHWAY
 DELRAY BEACH, FLORIDA 33438
 PALM BEACH COUNTY, FLORIDA

WILLIAM PFEFFER, P.E.
 LICENSE NO. 73085
 01/31/2019
PLAN REVISIONS

DATE	DESCRIPTION
01/31/2019	EL. RM. JT. DESIGN. DRAIN. CHKD

SCALE 1" = 30'
 JOB No. 010463-01-002
 DATE 01/31/2019
 FILE 09-010463-01-002-UTP.dwg
 SHEET **C-14**



PRESSURE PIPE NOTES:

1. 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 EPOXY LINED IN ACCORDANCE WITH AWWA C500.
3. DUCTILE IRON PIPE (DIP) FOR WATER MAINS SHALL BE CLASS 350 IN ACCORDANCE WITH AWWA C151 (ANSI A21.5), AND SHALL HAVE AN INTERNAL LAYER 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 METAL TAPS ABOVE C-900.
5. ALL FITTINGS SHALL BE CLASS 350 DUCTILE IRON WITH MECHANICAL JOINTS AND EPOXY LINING.
6. WATER MAIN AND SEWAGE FORCE MAIN VALVES 12 INCHES AND SMALLER SHALL BE RESILIENT 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 LARGER THAN 12 INCHES SHALL BE RESILIENT WEDGE GATE VALVES IN ACCORDANCE WITH AWWA C515.
7. ALL TRENCHING, PIPE-LAYING, BACKFILL, PRESSURE TESTING, AND DISINFECTION MUST COMPLY WITH CITY AND HEALTH DEPARTMENT STANDARDS.
8. WATER AND FORCE MAINS SHALL BE PIGGED, AS WELL AS, PRESSURE TESTED FOR A PERIOD OF NOT LESS THAN TWO HOURS AT 150 PSI IN ACCORDANCE WITH AWWA C600 LATEST STANDARDS. ALLOWABLE LEAKAGE SHALL BE DETERMINED AS FOLLOWS:

$$L = \frac{(5500 \times P) \times 0.50}{148,000} \times (L)$$

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 PP2.1
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 DIA. PLUS 2" OR NEXT LARGER DIA.
12. NO PROPOSED STRUCTURES SHALL BE INSTALLED WITHIN A HORIZONTAL DISTANCE OF 10-FEET FROM ANY EXISTING OR PROPOSED WATER MAINS OR FORCE MAINS.
13. LINE STOPS SHALL BE INSTALLED A MINIMUM OF 3 PIPE LENGTHS FROM LOCATION OF PIPE REMOVED, OTHERWISE, PROVIDE NECESSARY JOINT RESTRAINTS.

CITY OF DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
400 SOUTH FEDERAL AVENUE, DELRAY BEACH, FLORIDA 33483

PRESSURE PIPE NOTES

PP 1.1

PRESSURE PIPE NOTES

NOT TO SCALE

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	55	79	103	125	147	189	228	266
45° VERT. OFFSET	22	38	49	59	69	88	106	123
22.5° VERT. OFFSET	10	14	19	23	28	35	43	50
11.25° VERT. OFFSET	7	12	17	21	26	34	42	49
90° VERT. OFFSET	2	4	6	8	10	14	17	21
45° VERT. OFFSET	1	1	1	2	3	5	7	8
PLUG (DEAD END)	32	45	59	70	83	107	129	151
INLINE VALVE	32	45	59	70	83	107	129	151
TEE (BRANCH RESTRAINT)	4"x10"	23						
	6"x10"	21	35					
	8"x10"	18	34	47				
	10"x10"	16	32	46	58			
	12"x10"	13	30	44	57	69		
	16"x10"	7	26	41	55	67	90	
REDUCER (LARGER PIPE RESTRAINT)	20"x10"	1	21	38	52	65	88	109
	24"x10"	1	16	34	49	62	86	108
	6"x12"	23						
	8"x12"	38	25					
	10"x12"	57	43	24				
	12"x12"	72	60	44	41			
REDUCER (SMALLER PIPE RESTRAINT)	16"x12"	99	90	78	75	45		
	20"x12"	123	116	107	105	81	45	
	24"x12"	146	140	132	131	111	82	45
	24"x12"	146	140	132	131	111	82	45

RESTRAIN PIPE ONE BELL PAST MINIMUM DISTANCE

CITY OF DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
400 SOUTH FEDERAL AVENUE, DELRAY BEACH, FLORIDA 33483

PIPE RESTRAINT TABLE FOR PRESSURE PIPE (SHEET 1 OF 2)

PP 2.1a

PIPE RESTRAINT TABLE FOR PRESSURE PIPE

NOT TO SCALE

NOTES:

1. THE DATA IN THE PREVIOUS TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
 SOIL TYPE: SAND
 TEST PRESSURE: 150 PSI, 200 PSI FOR PIPES LARGER THAN 24"
 TRENCH TYPE: 3"
 DEPTH OF BURY: 3"
 TRENCH TYPE: 3"
 SAFETY FACTOR: 1.5
 VERTICAL OFFSET: 3"
 MINIMUM PIPE LENGTHS ALONG TEE RUN: 5"
2. THE RESTRAINED PIPE LENGTHS APPLY TO DUCTILE IRON PIPE AND PVC PIPE.
3. ALL JOINTS BETWEEN UPPER AND LOWER BENDS SHALL BE RESTRAINED.
4. RESTRAINED PIPE LENGTHS FOR VALVES APPLY TO PIPE ON BOTH SIDES OF VALVES.
5. THE PREVIOUS TABLE SHALL BE USED 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.
6. SOURCES: EBAA IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1 AND DIPRA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2.
7. RESTRAIN JOINTS SHALL EXTEND ONE JOINT BEYOND MIN. LENGTH REQUIRED.

CITY OF DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
400 SOUTH FEDERAL AVENUE, DELRAY BEACH, FLORIDA 33483

PIPE RESTRAINT TABLE FOR PRESSURE PIPE (SHEET 2 OF 2)

PP 2.1b

GRAVITY SEWER NOTES:

1. MANHOLES SHALL BE INSPECTED BY THE ENGINEER BEFORE PLACEMENT AND SURFACE TREATMENT.
2. ALL OPENINGS IN PRECAST MANHOLES SHALL BE CAST AT TIME OF MANUFACTURE. CONNECTIONS TO EXISTING MANHOLES SHALL BE CORE ENTRY ONLY.
3. ALL MANHOLES SHALL BE SET PLUMB TO LINE AND GRADE.
4. (PVC) GRAVITY SEWER PIPE SHALL CONFORM TO ASTM D 3034, SDR 35, LATEST REVISIONS, WITH PUSH ON RUBBER GASKET JOINTS.
5. (DIP) GRAVITY SEWER PIPE SHALL BE CLASS 350 EPOXY LINED OR AS OTHERWISE APPROVED BY ENVIRONMENTAL SERVICES DEPARTMENT.
6. NO SERVICE CONNECTIONS, WYES, SERVICES OR VALVES WILL BE PERMITTED IN RESIDENTIAL DRIVEWAYS.
7. MANHOLE FRAMES SHALL BE ATTACHED TO THE PRECAST STRUCTURE WITH A MINIMUM OF TWO 3/4" x 3/8" STAINLESS STEEL BOLTS. NUTS AND WASHERS FRAMES SHALL BE SEALED WITH A MINIMUM OF TWO 1/2" BEADS OF RAM-NEW CAULKING.
8. 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.
9. PVC SHALL BE LAID IN STRICT CONFORMANCE TO MANUFACTURER'S SPEC (GOWNS MANUVELE RING SITE PVC PIPE INSTALLATION GUIDE OR EQUAL). BACKFILLING OF UTILITY TRENCHES WILL NOT BE ALLOWED UNTIL INSPECTED BY THE ENGINEER.
10. 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.
11. ALL 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.
12. WHERE SEWER IS NOT WITHIN PUBLIC R/W, IT IS TO BE LOCATED IN A 12' UTILITY EASEMENT. CITY MAINTENANCE RESPONSIBILITY IS MANHOLE TO MANHOLE ONLY.
13. 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 LOW PRESSURE WATER TEST. AFTER PASSING EACH INSPECTION & PRIMER SHALL BE APPLIED. 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.
14. EACH LINE SEGMENT SHALL BE LAMPED TO DETERMINE PROPER ROUNDNESS.
15. 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.
16. AT THE END OF THE ONE (1) YEAR WARRANTY PERIOD THE DEVELOPER/CONTRACTOR WILL T.V. INSPECT, AIR TEST EVERY JOINT, JOINTS MANHOLE JOINTS AND CONNECTIONS TO DETERMINE IF REPAIRS ARE NECESSARY BEFORE THE WARRANTY BOND IS RELEASED.
17. NO PROPOSED STRUCTURES SHALL BE INSTALLED WITHIN A HORIZONTAL DISTANCE OF 10-FEET FROM ANY EXISTING OR PROPOSED SANITARY SEWER FACILITY.
18. ANY PIPE INTRODUCED INTO AN EXISTING MANHOLE MUST HAVE CARBONACE BITUMASTIC 300M OR APPROVED EQUAL, APPLIED EXTERNALLY WITHIN A MINIMUM 2-FOOT RADIUS OF OPENING AND THE ENTIRE MANHOLE MUST HAVE SEMENT COAT OR APPROVED EQUAL APPLIED INTERNALLY.
19. ANY REHABILITATION TO AN EXISTING MANHOLE MUST BE INTERNALLY STRIPPED AND LINED WITH SEMENT COAT OR APPROVED EQUAL.

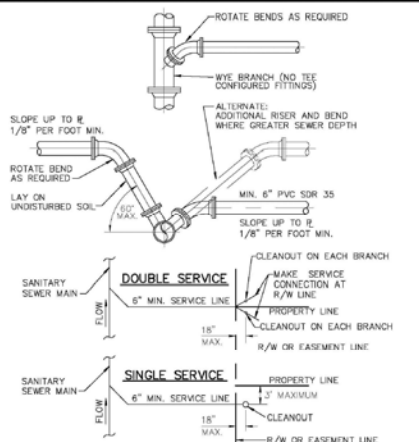
CITY OF DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
400 SOUTH FEDERAL AVENUE, DELRAY BEACH, FLORIDA 33483

GRAVITY SEWER NOTES

WW 1.1

GRAVITY SEWER NOTES

NOT TO SCALE



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 2.1 FOR SEPARATION REQUIREMENTS.

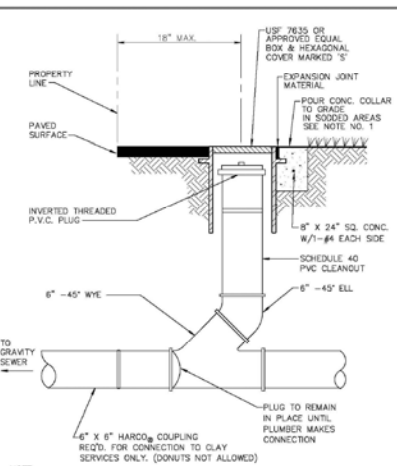
CITY OF DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
400 SOUTH FEDERAL AVENUE, DELRAY BEACH, FLORIDA 33483

SEWER SERVICE CONNECTION

WW 4.1

SEWER SERVICE CONNECTION

NOT TO SCALE



NOTE:

1. INVERTED BRASS CAP SHALL BE USED IN GRASS AREAS IN LIEU OF CASTING AND CONC. COLLAR.
2. MINIMUM DEPTH OF SERVICE LATERAL SHALL BE 3 FEET.

CITY OF DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
400 SOUTH FEDERAL AVENUE, DELRAY BEACH, FLORIDA 33483

TYPICAL COMMERCIAL CLEANOUT

WW 5.2

TYPICAL COMMERCIAL CLEANOUT

NOT TO SCALE

Bowman
CONSULTING
Certificate of Authorization License No. 39402

Bowman Consulting Group, Ltd.
13445 W. Sunrise Blvd.,
Suite 200
Buckley, FL 33333
Phone: (954) 714-4470
www.bowmanconsulting.com
© Bowman Consulting Group, Ltd.

CHEVROLET - DELRAY BEACH
2605 SOUTH FEDERAL HIGHWAY
DELRAY BEACH, FLORIDA 33483
PALM BEACH COUNTY, FLORIDA

UTILITY DETAILS

WILLIAM PFEFFER, P.E. LICENSE NO. 70085 01/01/2019	
PLAN REVISIONS	
DATE	DESCRIPTION
EL	RM
DESIGN	DRN
SCALE	CHKD
JOB NO. 010463-01-002	
DATE 01/31/2019	
FILE 07-010463-01-002-001.dwg	

C-16

