

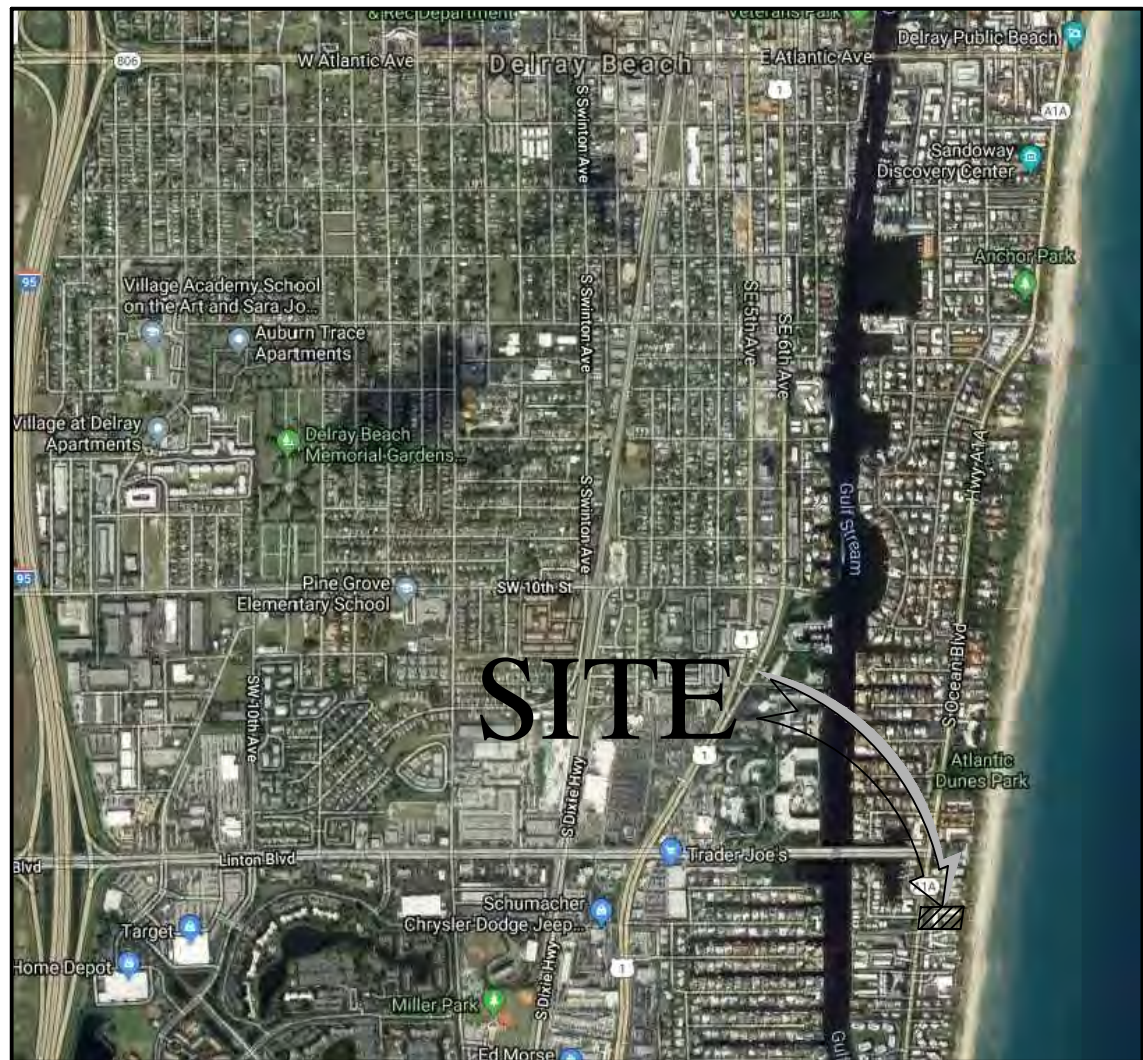
OCEAN DELRAY

PROPOSED CONDOMINIUM BUILDING

1901 SOUTH OCEAN BOULEVARD

DELRAY BEACH, FLORIDA 33483

CIVIL SITE PLAN PACKAGE

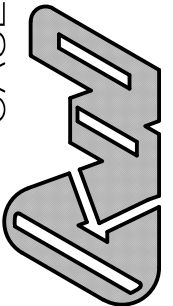


LOCATION MAP
NOT TO SCALE

SHEET	DESCRIPTION
CS	Cover Sheet
PP-1	Pollution Prevention Plan
PD-1	General Notes Plan
PD-1A	Demolition Plan
PD-2	Paving & Grading Plan
PD-2A	Drainage Plan
PD-3	Pavement Marking & Signage Plan
PD-4 to PD-7	Paving & Grading & Drainage Details
WS-1	Water Distribution, Sanitary Sewer and Utility Plan
WS-2,WS-3,WS-4	Water Distribution, & Sanitary Sewer Details
WS-5	Composite Utility Plan

REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK
REVISED PER CITY COMMENTS	01/10/19	MVK
REVISED PER ARCH CHANGES	11/16/18	MVK
REVISIONS	DATE	BY
FILE NAME: 8296_Eng.dwg		

CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-4452

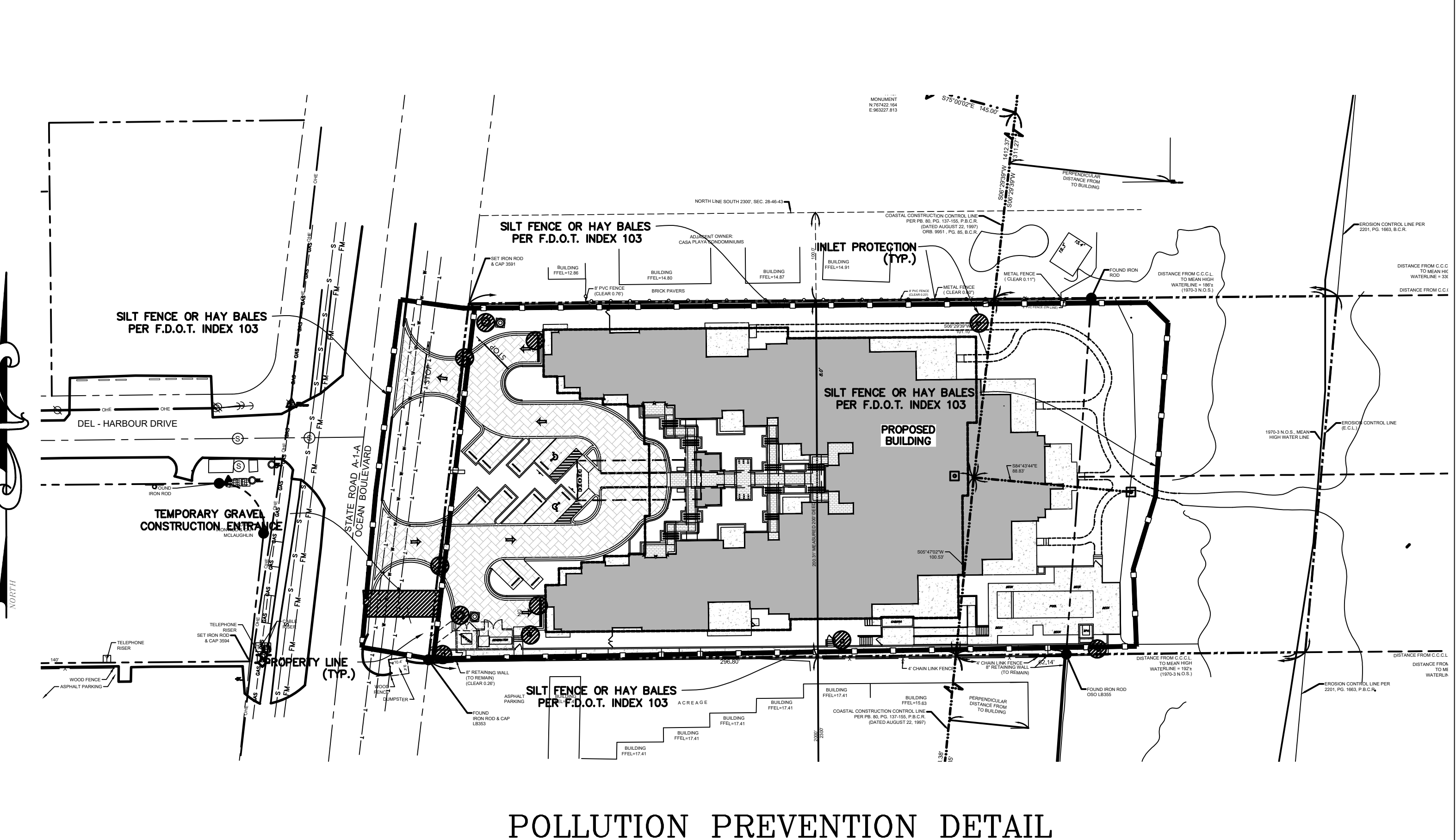
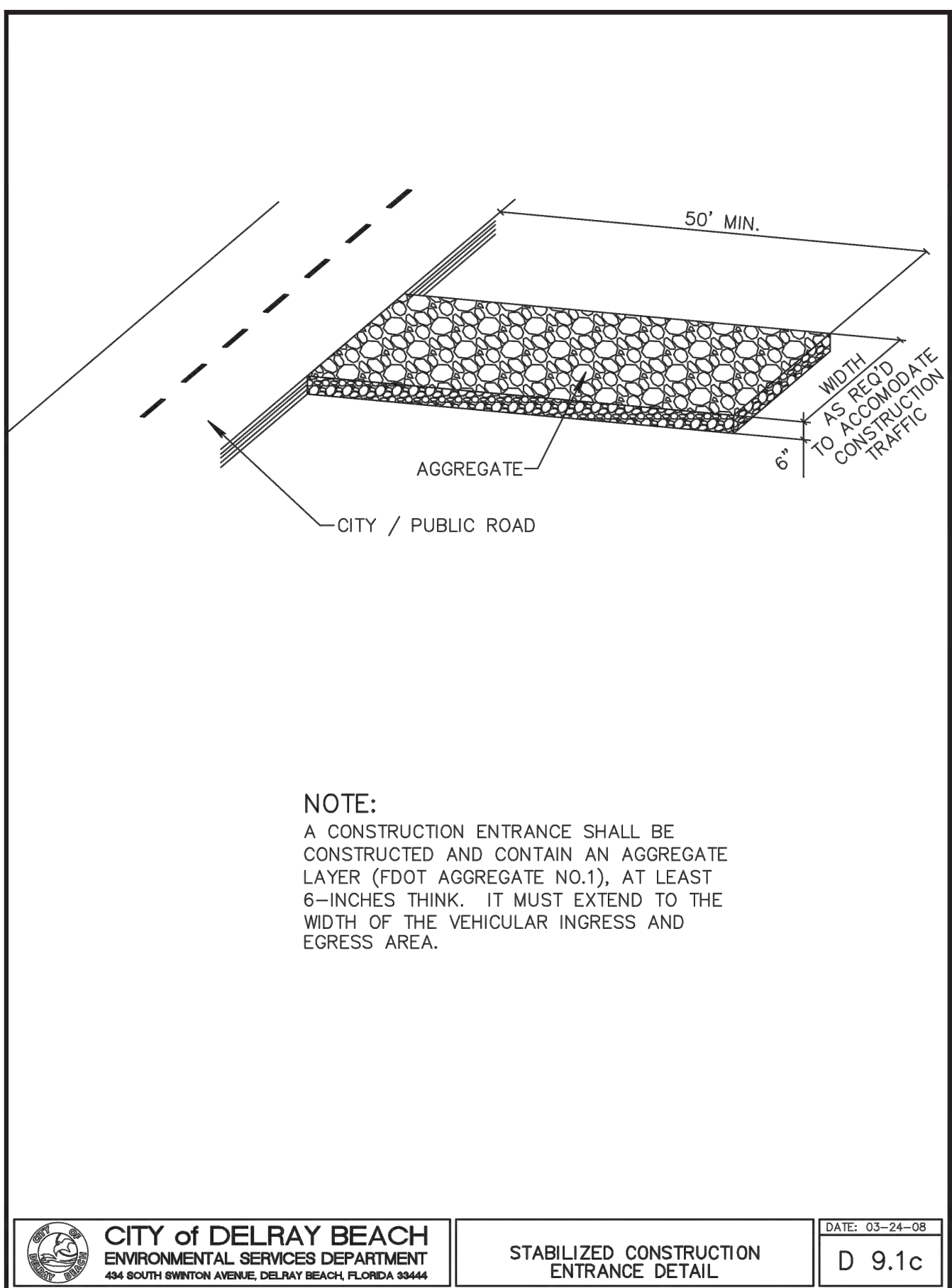
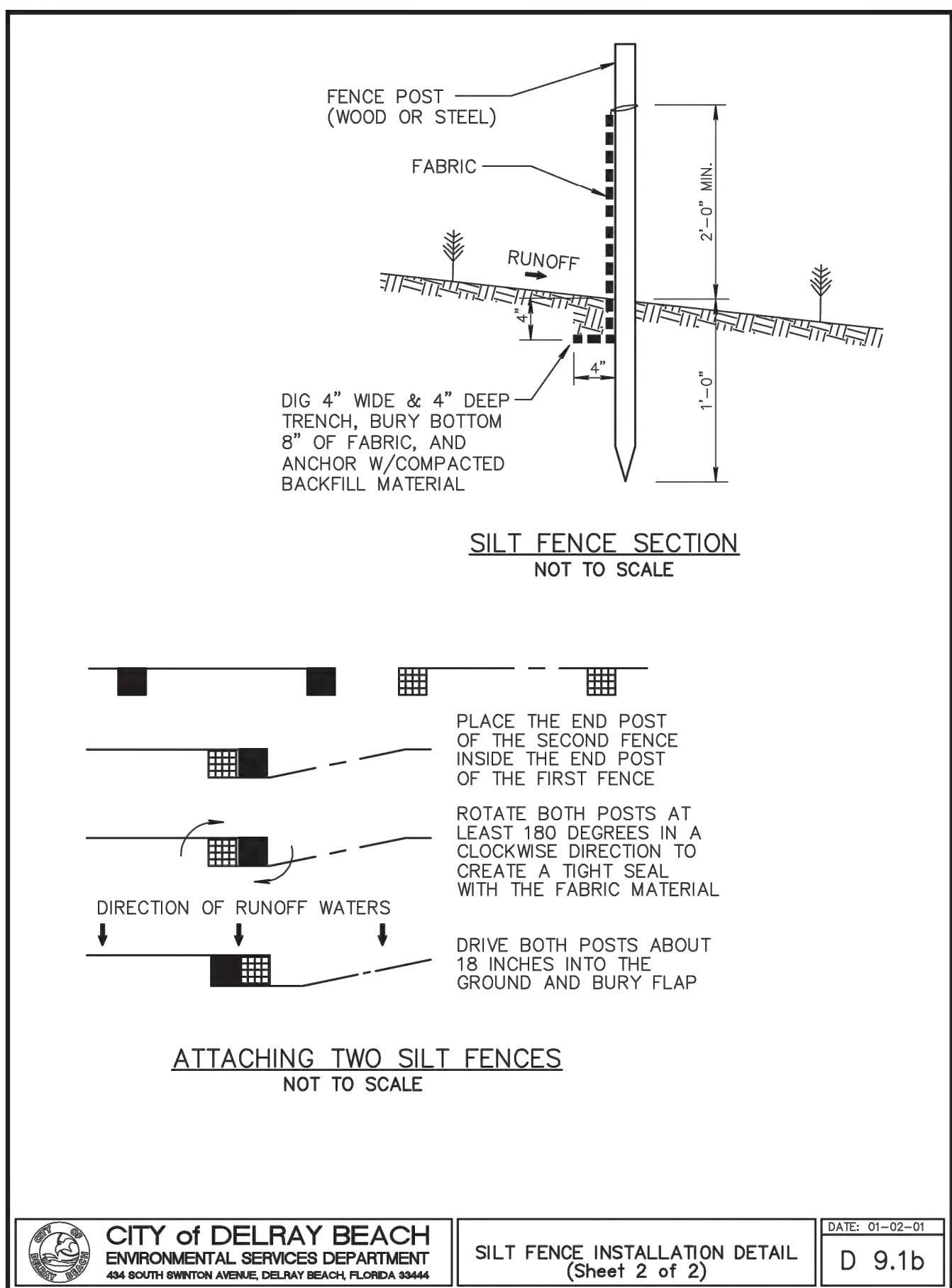
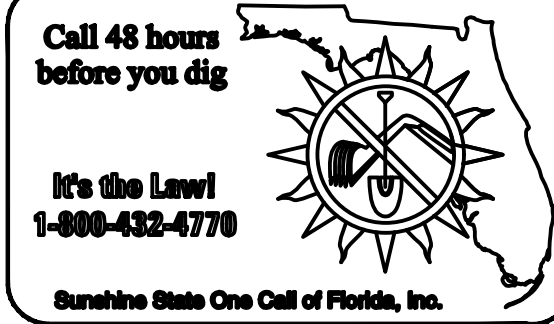
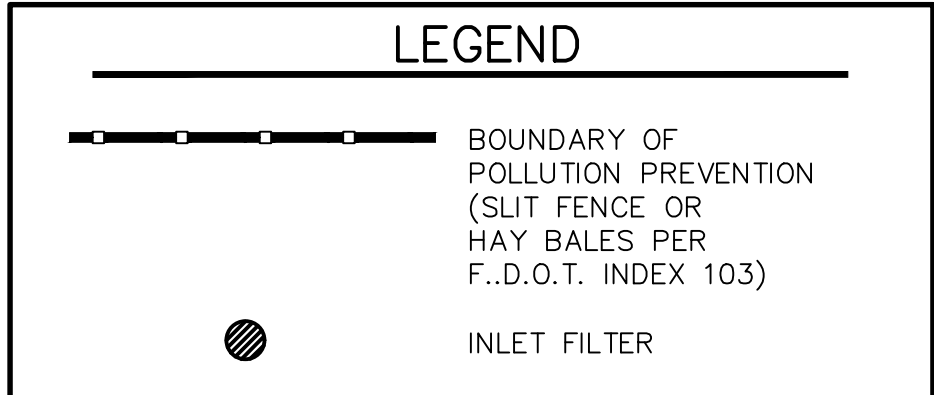
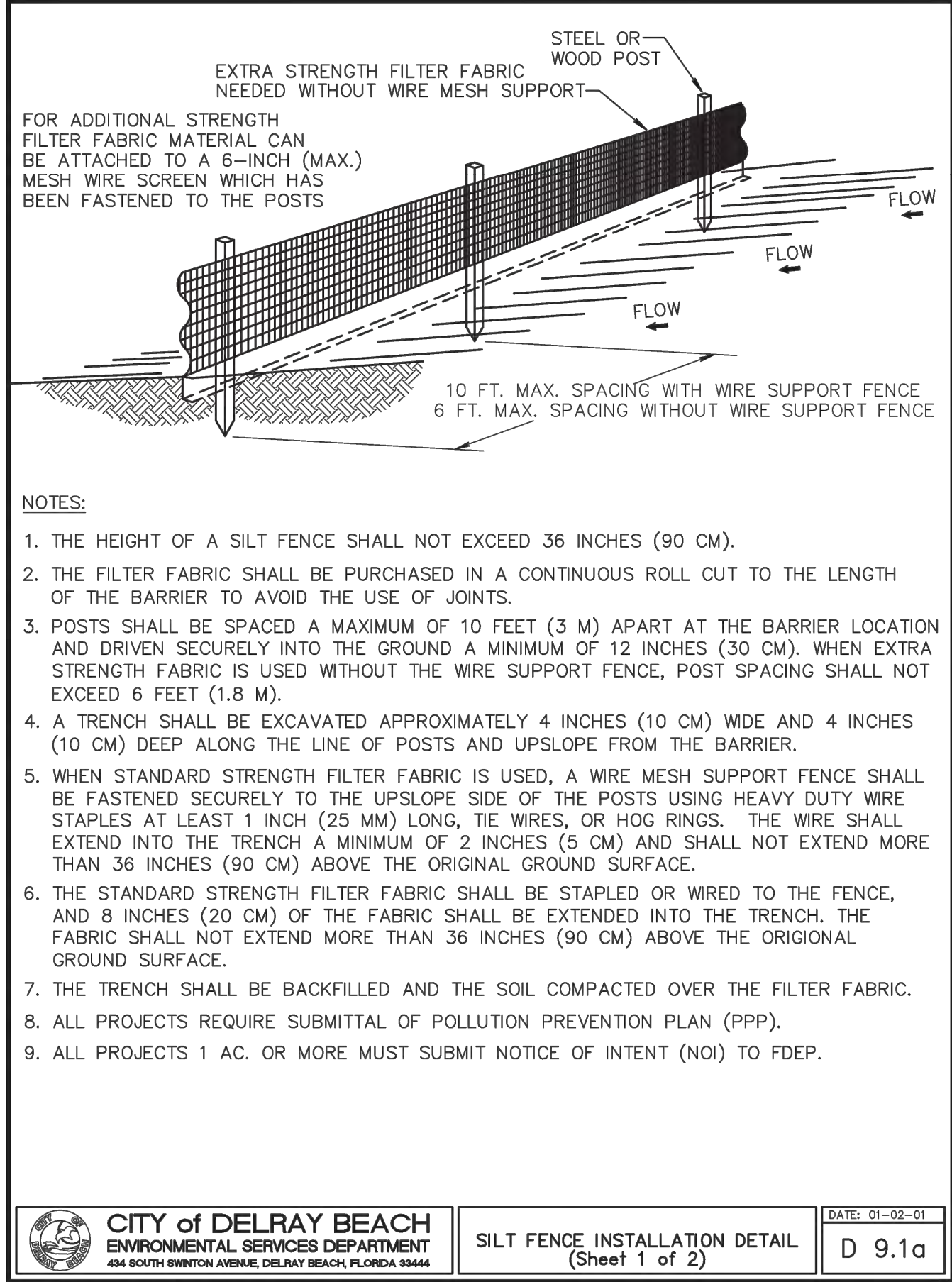
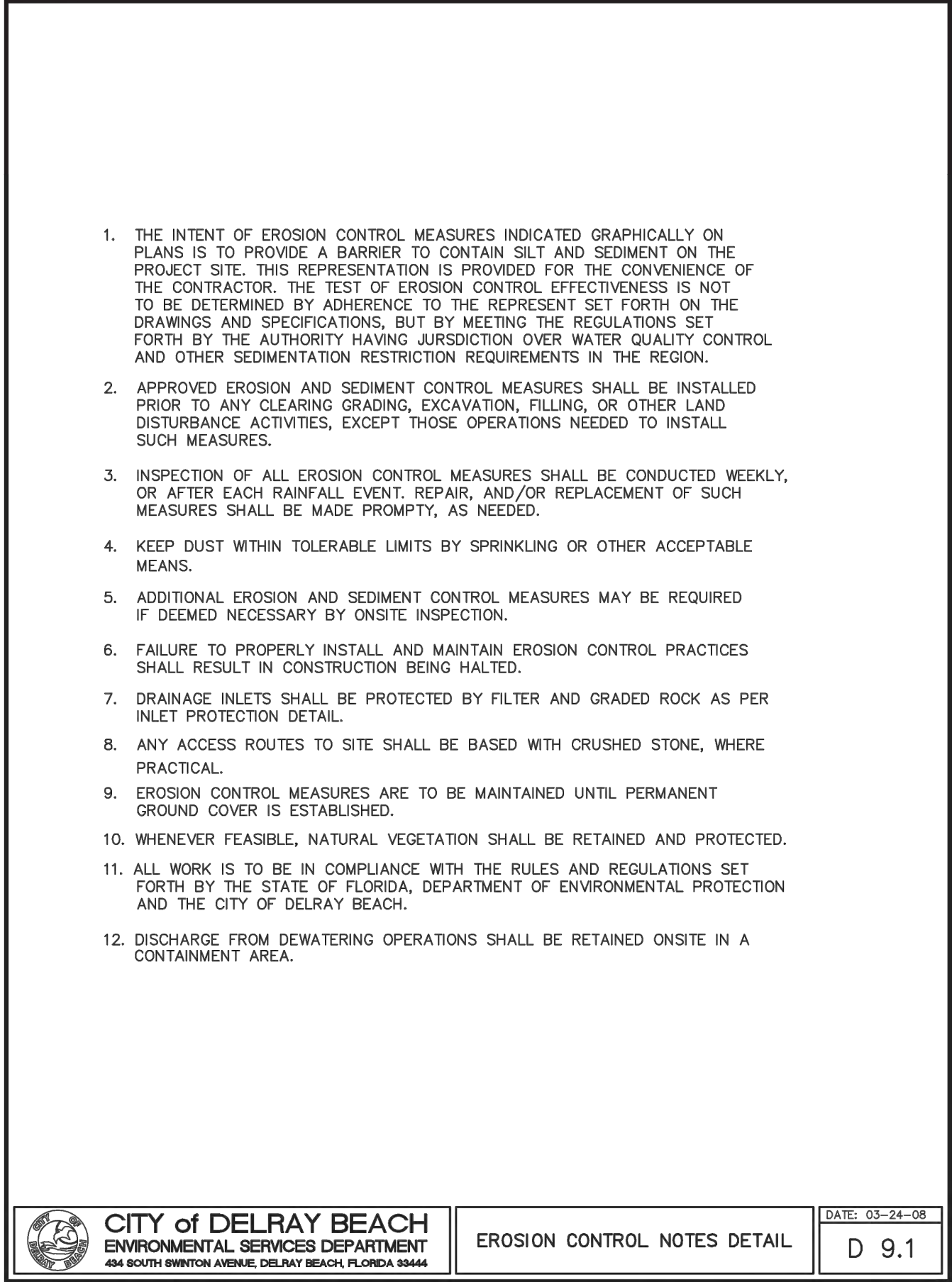
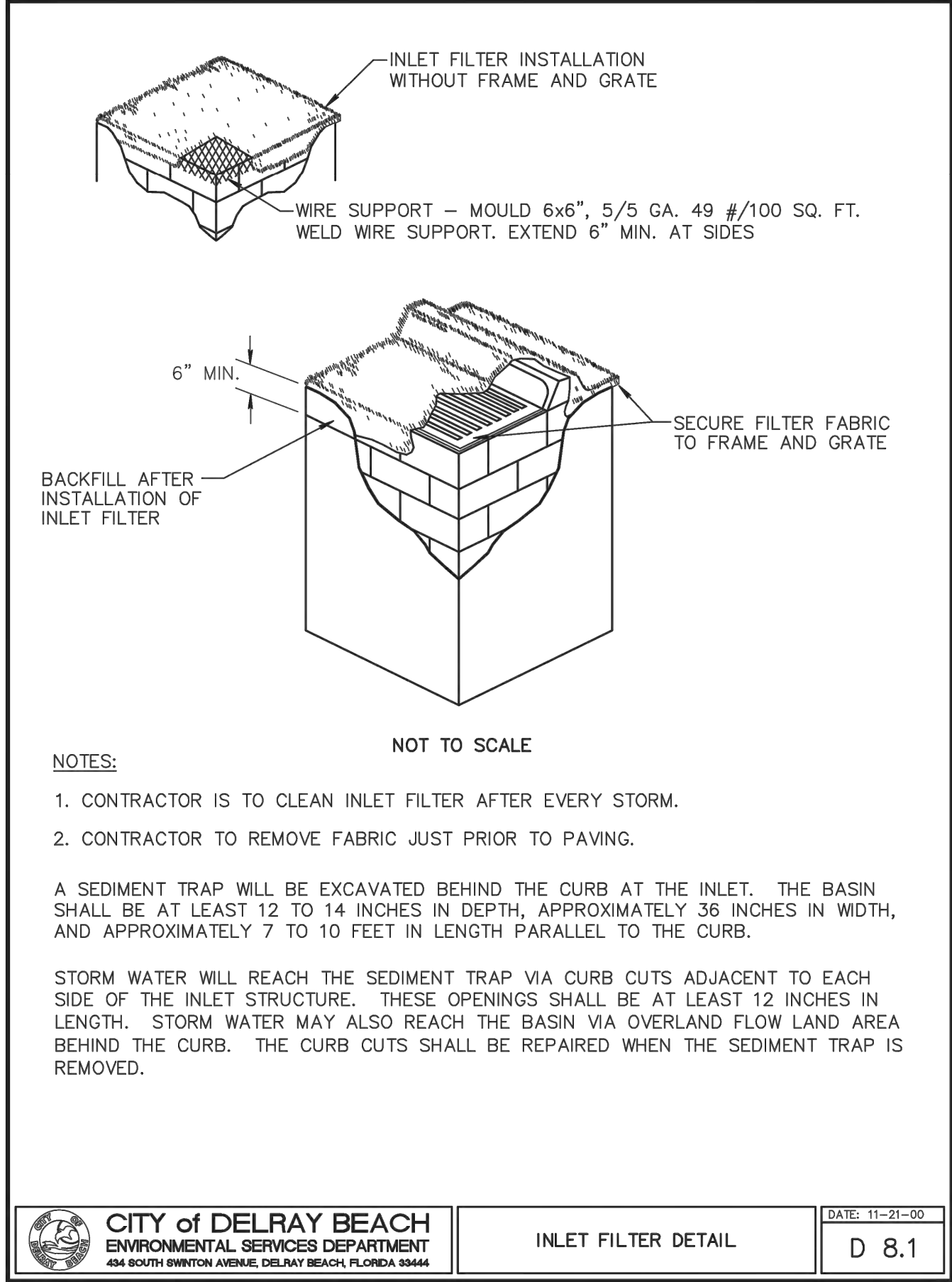


OCEAN DELRAY
COVER SHEET
DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B. / PG.	----
SCALE	1"= 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
- FOR THE FIRM -
DATE

JOB # 8296
SHT.NO.
CS
OF 15 SHEETS



REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK
REVISED PER CITY COMMENTS	01/10/19	MVK
REVISED PER ARCH CHANGES	11/16/18	MVK
REVISIONS	DATE	BY
FILE NAME: 8296-ENG.dwg		

CAULFIELD & WHEELER, INC.

CIVIL ENGINEERING - LAND SURVEYING

LANDSCAPE ARCHITECTURE

7900 GLADES ROAD - SUITE 100

BOCA RATON, FLORIDA 33434

PHONE (561)-392-1991 / FAX (561)-750-4452

OCEAN DELRAY

POLLUTION PREVENTION PLAN AND DETAILS

DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B./ PG.	---
SCALE	1" = 30'

MATTHEW V. KAHN

PROFESSIONAL ENGINEER

LICENSE NO. 82227

STATE OF FLORIDA

FOR THE FIRM -

DATE

JOB # 8296

SHT. NO.

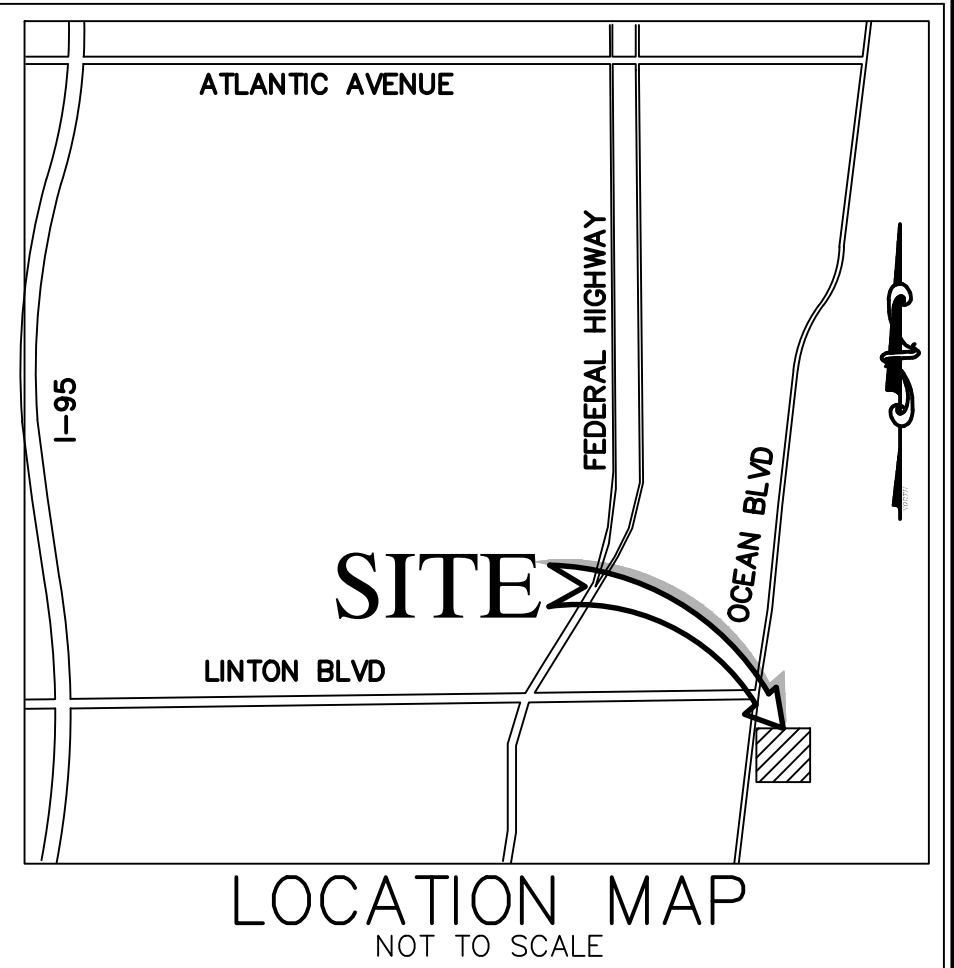
PP-1

OF 15 SHEETS

NOTE:
ELEVATION ARE SHOWN IN NAVD
CONVERSION NAVD+1.54 = NGVD

LEGEND

---	PROPERTY/ROW LINE
---	PROPOSED PIPE AND CATCH BASIN
---	EXISTING GRADE
---	TO BE REMOVED
W	PROPOSED WATER LINE
W	EXISTING WATER LINE
S	PROPOSED SANITARY SEWER LINE
S	EXISTING SANITARY SEWER LINE
E	PROPOSED ELECTRIC LINE
OH	EXISTING OVERHEAD LINE
T	PROPOSED TELEPHONE/CABLE LINE
T	EXISTING TELEPHONE/CABLE LINE
G	PROPOSED GAS LINE
G	EXISTING GAS LINE



REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK	BY
REVISED PER CITY COMMENTS	01/10/19	MVK	
REVISED PER ARCH CHANGES	11/16/18	MVK	
REVISIONS	DATE		
FILE NAME: 8296_R16.dwg			

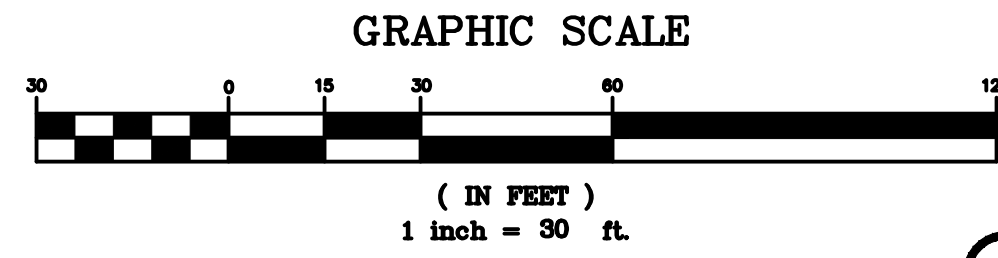
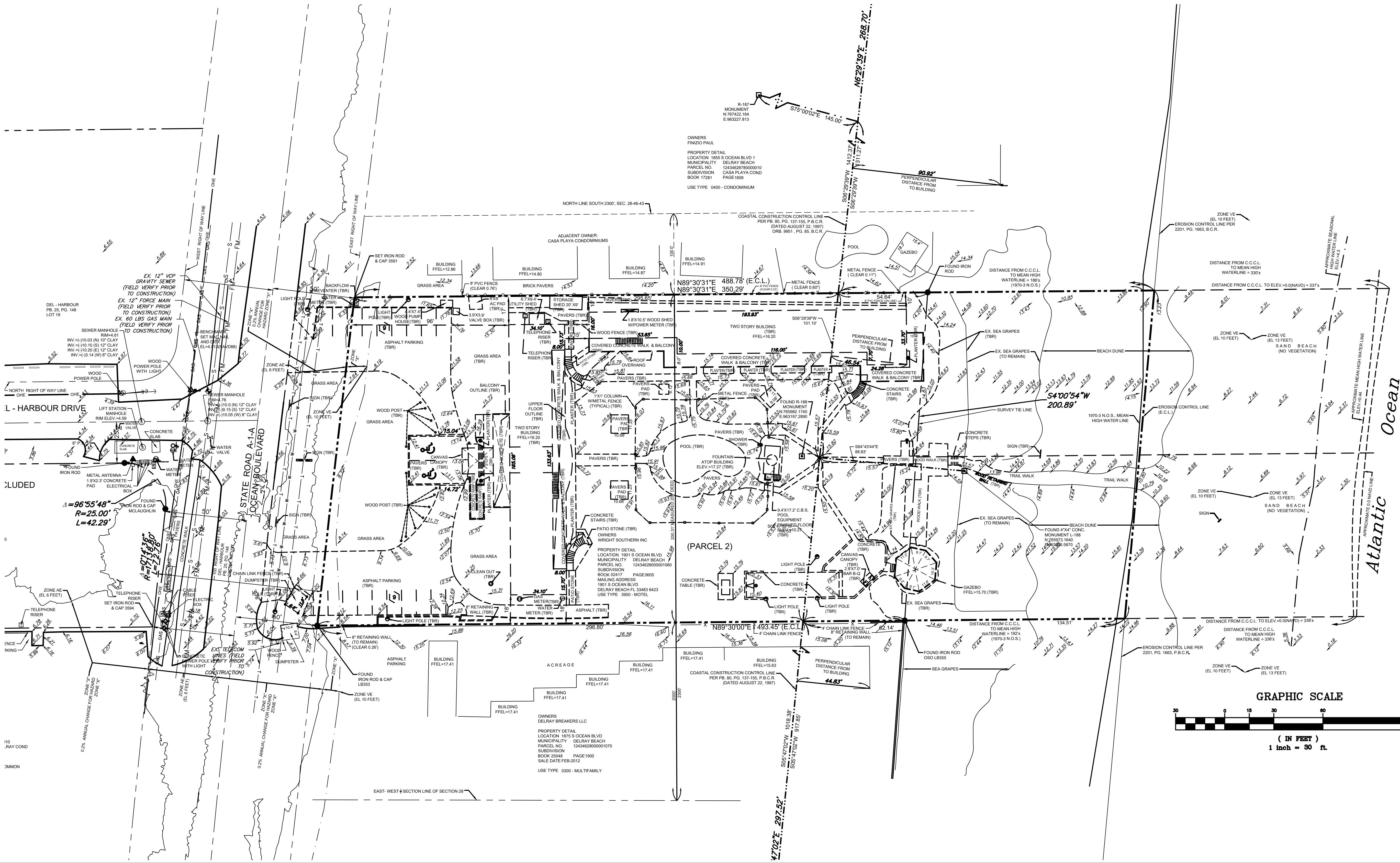
CAULFIELD 8 WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-1452

OCEAN DELRAY PROPOSED DEMOLITION PLAN DELRAY BEACH, FLORIDA

DATE 10/01/18
DRAWN BY MVK
F.B./PG. ---
SCALE 1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
- FOR THE FIRM -
DATE

JOB # 8296
SHT. NO.
PD-1A
OF 15 SHEETS



NOTE:
ELEVATION ARE SHOWN IN NAVD
CONVERSION NAVD+1.54 = NGVD

NOTE:
ANY TREES OR SHRUBS PLACED
WITHIN WATER, SEWER OR DRAINAGE
EASMENTS SHALL CONFORM TO THE
CITY OF DELRAY BEACH STANDARD
DETAILS: LD 1.1 & 1.2

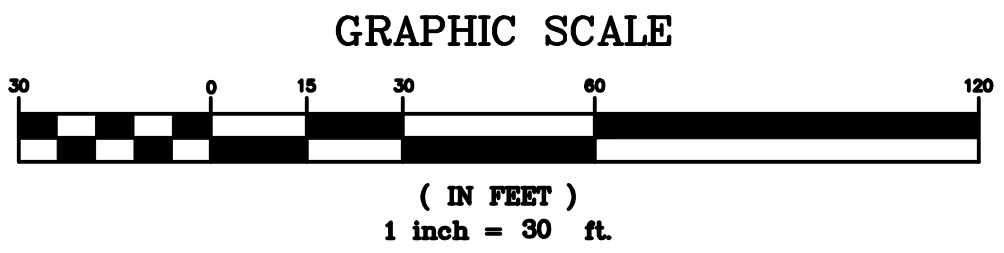
DRAINAGE CRITERIA

CONTROL WATER ELEV. = -1.00' NAVD
MIN. ROAD ELEV. = 6.50' NAVD
100-YR-3DAY FLOOD (0 DISCHARGE) ELEV. = 10.34' NAVD
MIN. FINISH FLOOR ELEV. = 16.50' NAVD
MIN. PERIMETER BERM ELEV. EQUAL TO OR GREATER
THAN 25 YR.-3 DAY STAGE ELEVATION= 4.66' NAVD

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill
Base Cut/Fill East of CCCL	1.000	1.200	16841.01 Sq. Ft.	524.68 Cu. Yd.	553.64 Cu. Yd.
12" Site Stripping*			5700.00 Sq. Ft.	0.00 Cu. Yd.	211.11 Cu. Yd.
Building Foundation Spoils				227.00 Cu. Yd.	0.00 Cu. Yd.
Pool/Spa Foundation Spoils				13.07 Cu. Yd.	0.00 Cu. Yd.
Total Site East of CCCL			16841.01 Sq. Ft.	764.75 Cu. Yd.	764.75 Cu. Yd.
Base Cut/Fill Pool/Spa Only East of CCCL	1.000	1.200	823.84 Sq. Ft.	187.96 Cu. Yd.	0.00 Cu. Yd.
Pool/Spa Foundation Spoils				13.07 Cu. Yd.	0.00 Cu. Yd.
Total Pool/Spa Only East of CCCL	1.000	1.200	823.84 Sq. Ft.	201.03 Cu. Yd.	0.00 Cu. Yd.

*12" surface layer within the footprint of the existing improvements is assumed to be non in-situ (i.e. contaminated with construction debris, shell rock and other foreign materials), and is deducted from the volume calculation above.
**Pool excavation volume included in the base cut volume (noted above).



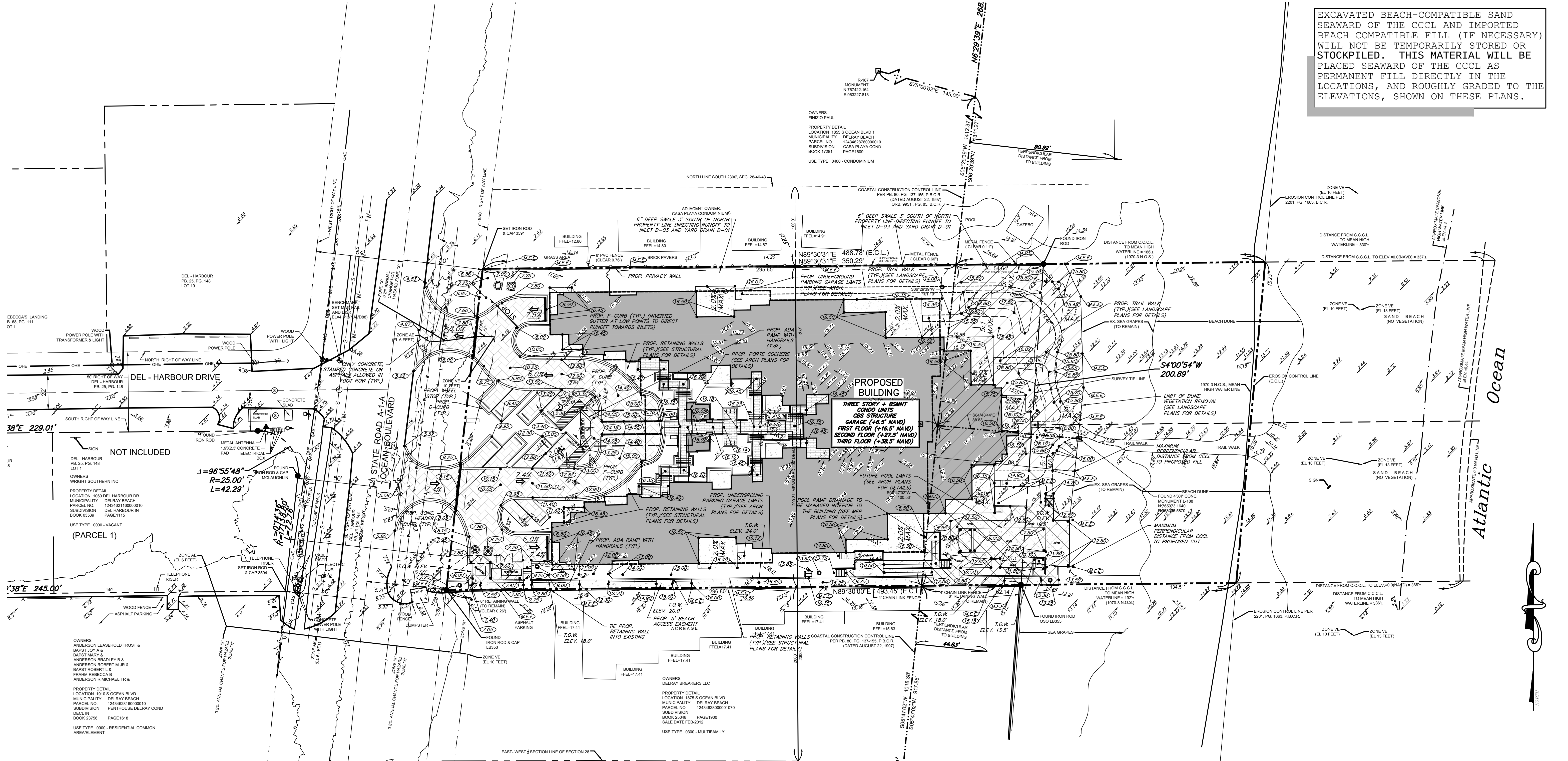
LEGEND

---	PROPERTY/ROW LINE	[Pattern]	PROPOSED CONCRETE (4")
---	PROPOSED PIPE AND CATCH BASIN	[Pattern]	PROPOSED PAVER DRIVEWAY
---	EXISTING GRADE	[Pattern]	PROPOSED PAVER WALKWAY
---	PROPOSED GRADE	[Pattern]	PROPOSED BUILDING
---	MATCH EXISTING GRADE	[Pattern]	PROPOSED FILL EAST OF THE CCCL
---	PROPOSED WATER LINE	[Pattern]	PROPOSED CUT EAST OF THE CCCL
---	EXISTING WATER LINE		
---	PROPOSED SANITARY SEWER LINE		
---	EXISTING SANITARY SEWER LINE		
---	PROPOSED ELECTRIC LINE		
---	EXISTING OVERHEAD LINE		
---	PROPOSED TELEPHONE/CABLE LINE		
---	EXISTING TELEPHONE/CABLE LINE		
---	PROPOSED GAS LINE		
---	EXISTING GAS LINE		

IF FILL IS REQUIRED TO BE
IMPORTED TO THE SITE AND
PLACED SEAWARD OF THE CCCL,
THE FILL SHALL COMPLY WITH
THE SPECIFICATIONS/CRITERIA
OF SUBSECTION 62B-33.005 (7),
F.A.C.



EXCAVATED BEACH-COMPATIBLE SAND
SEAWARD OF THE CCCL AND IMPORTED
BEACH COMPATIBLE FILL (IF NECESSARY)
WILL NOT BE TEMPORARILY STORED OR
STOCKPILED. THIS MATERIAL WILL BE
PLACED SEAWARD OF THE CCCL AS
PERMANENT FILL DIRECTLY IN THE
LOCATIONS, AND ROUGHLY GRADED TO THE
ELEVATIONS, SHOWN ON THESE PLANS.



CAULFIELD 8 WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561)-392-1991 / FAX (561)-750-1452

OCEAN DELRAY
PROPOSED PAVING
& GRADING PLAN
DELRAY BEACH, FLORIDA

DATE 10/01/18
DRAWN BY MVK
F.B./ PG. ---
SCALE 1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
- FOR THE FIRM -
DATE

JOB # 8296
SHT. NO.
PD-2
OF 15 SHEETS

NOTE:
ELEVATION ARE SHOWN IN NAVD
CONVERSION NAVD+1.54 = NGVD

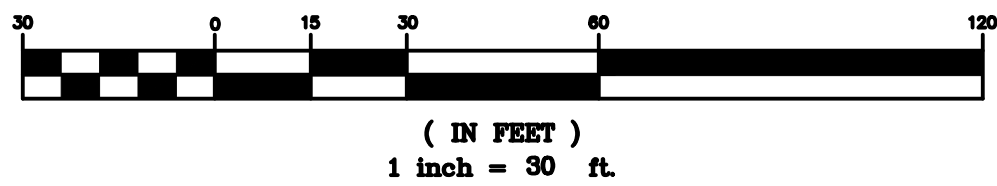
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WITHIN WATER, SEWER OR DRAINAGE
EASEMENTS SHALL CONFORM TO THE
CITY OF DELRAY BEACH STANDARD
DETAILS: LD 1.1 & 1.2

DRAINAGE CRITERIA

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MIN. ROAD ELEV. = 6.50' NAVD
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MIN. FINISH FLOOR ELEV. = 16.50' NAVD
MIN. PERIMETER BERM ELEV. EQUAL TO OR GREATER
THAN 25 YR.-3 DAY STAGE ELEVATION= 4.66' NAVD

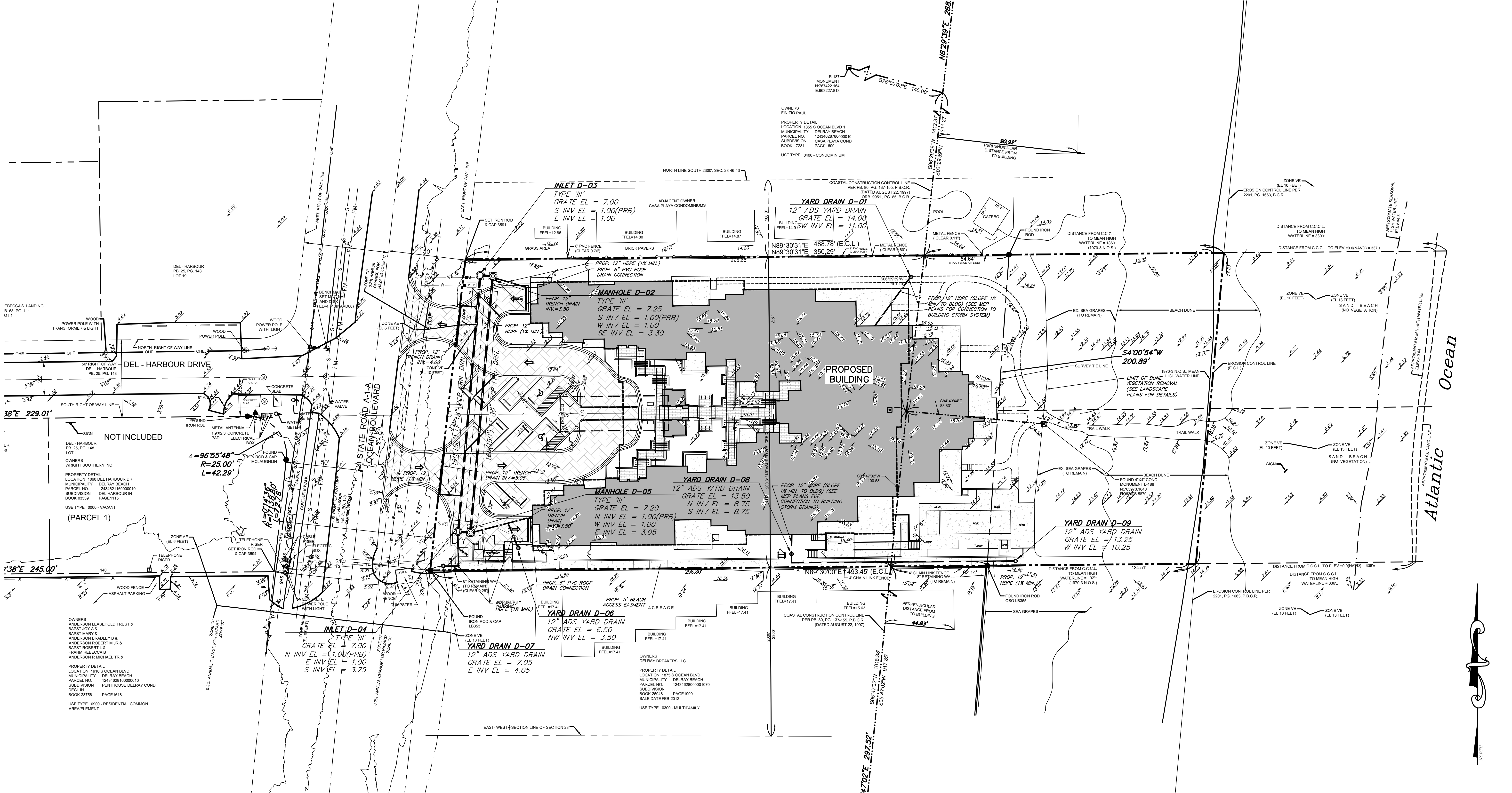


GRAPHIC SCALE



LEGEND

- | | | | |
|-------|-------------------------------|-----------|--------------------------------|
| --- | PROPERTY/ROW LINE | [Pattern] | PROPOSED CONCRETE (4") |
| --- | PROPOSED PIPE AND CATCH BASIN | [Pattern] | PROPOSED PAVER DRIVEWAY |
| --- | EXISTING GRADE | [Pattern] | PROPOSED PAVER WALKWAY |
| W--- | PROPOSED WATER LINE | [Pattern] | PROPOSED BUILDING |
| W--- | EXISTING WATER LINE | [Pattern] | PROPOSED FILL EAST OF THE CCCL |
| S--- | PROPOSED SANITARY SEWER LINE | [Pattern] | PROPOSED CUT EAST OF THE CCCL |
| S--- | EXISTING SANITARY SEWER LINE | | |
| E--- | PROPOSED ELECTRIC LINE | | |
| OH--- | EXISTING OVERHEAD LINE | | |
| T--- | PROPOSED TELEPHONE/CABLE LINE | | |
| T--- | EXISTING TELEPHONE/CABLE LINE | | |
| G--- | PROPOSED GAS LINE | | |
| G--- | EXISTING GAS LINE | | |



REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK	BY
REVISED PER CITY COMMENTS	01/10/19	MVK	DATE
REVISED PER ARCH CHANGES	11/16/18	MVK	
REVISIONS			
FILE NAME	8296_RNC.dwg		

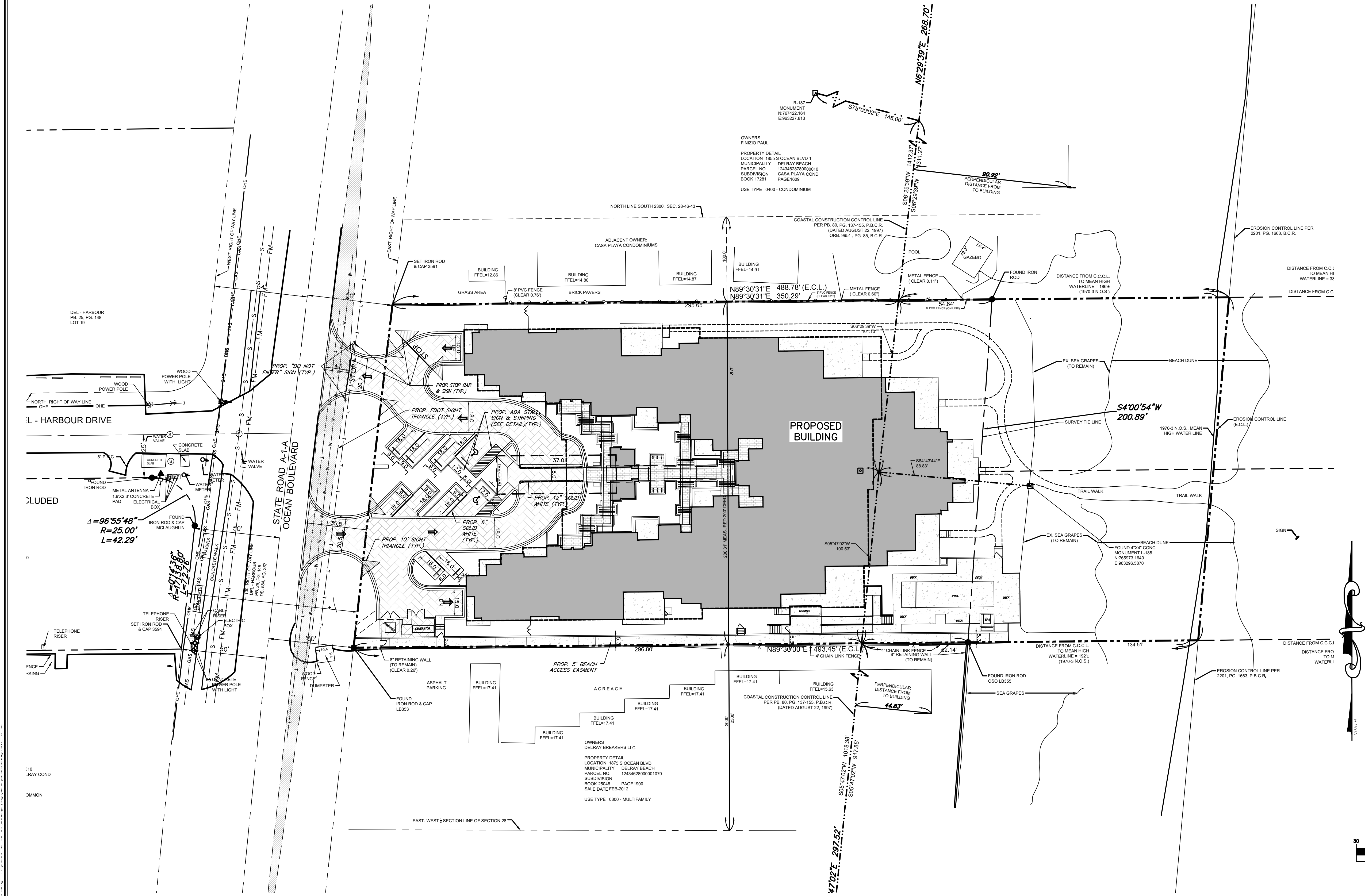
CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-1452

OCEAN DELRAY PROPOSED DRAINAGE PLAN DELRAY BEACH, FLORIDA

DATE 10/01/18
DRAWN BY MVK
F.B./ P.G. ---
SCALE 1" = 30'

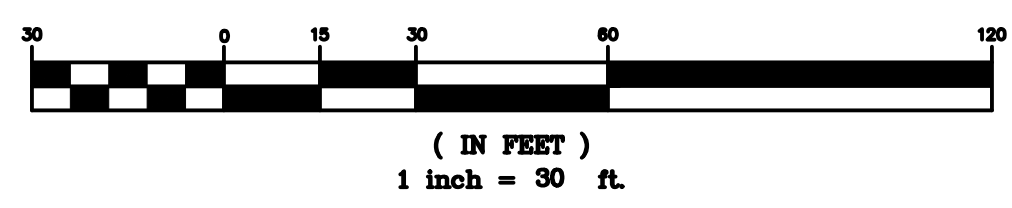
MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
FOR THE FIRM -
DATE

JOB # 8296
SHT. NO.
PD-2A
OF 15 SHEETS



LEGEND

- PROPERTY/ROW LINE
- PROPOSED PIPE AND CATCH BASIN
- PROPOSED CONCRETE (4")
- PROPOSED PAVER DRIVEWAY
- PROPOSED PAVER WALKWAY
- PROPOSED BUILDING



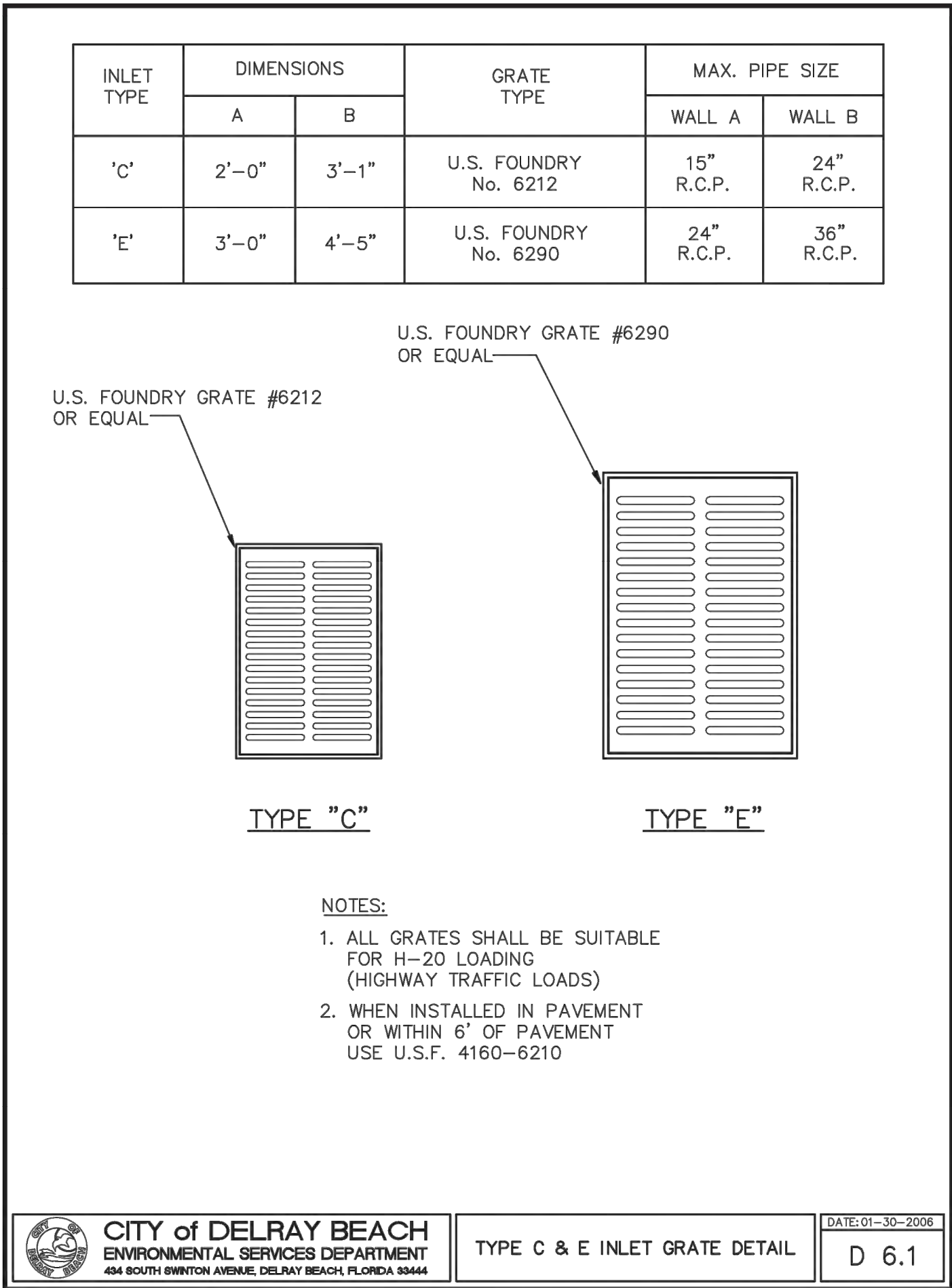
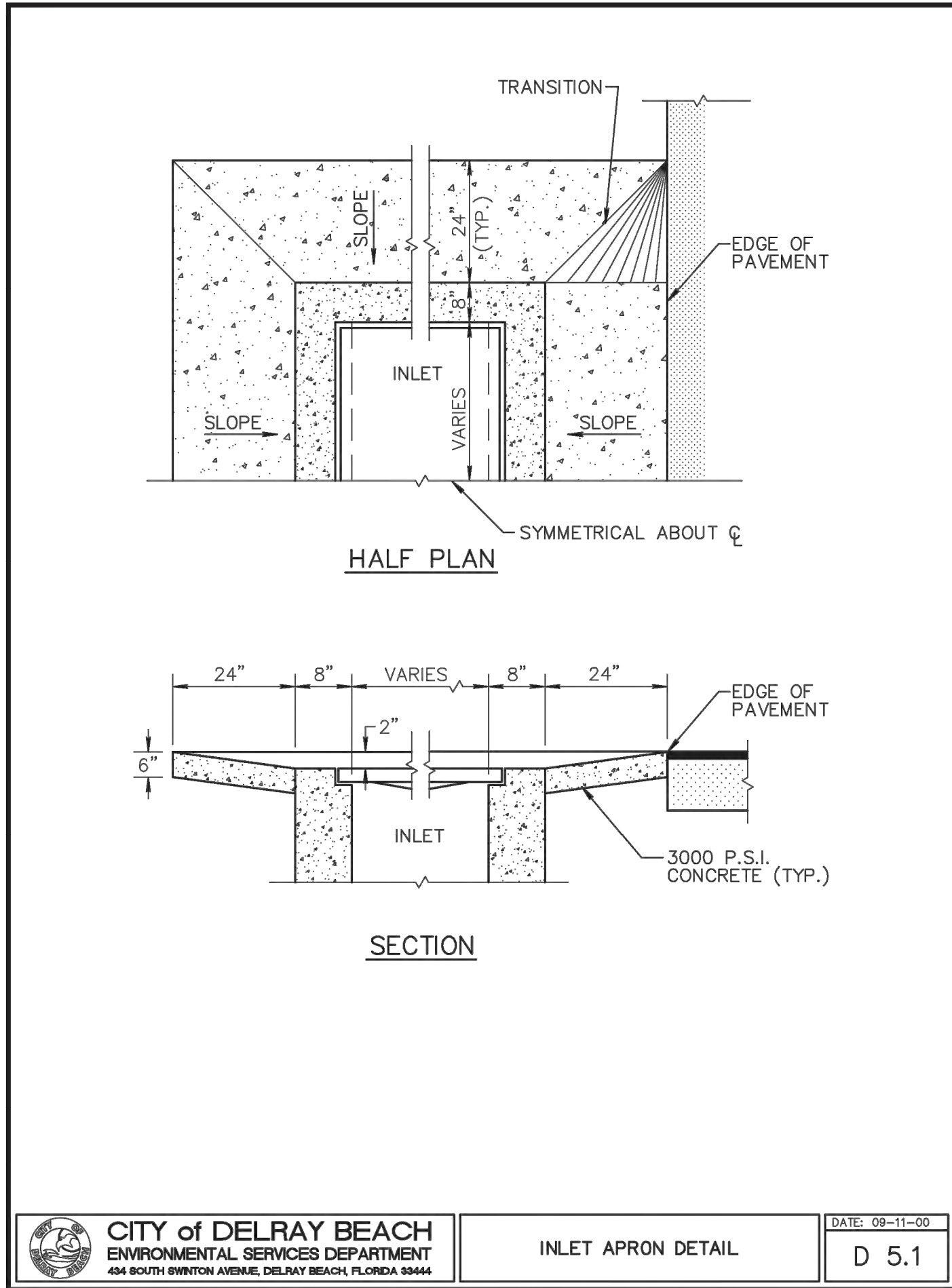
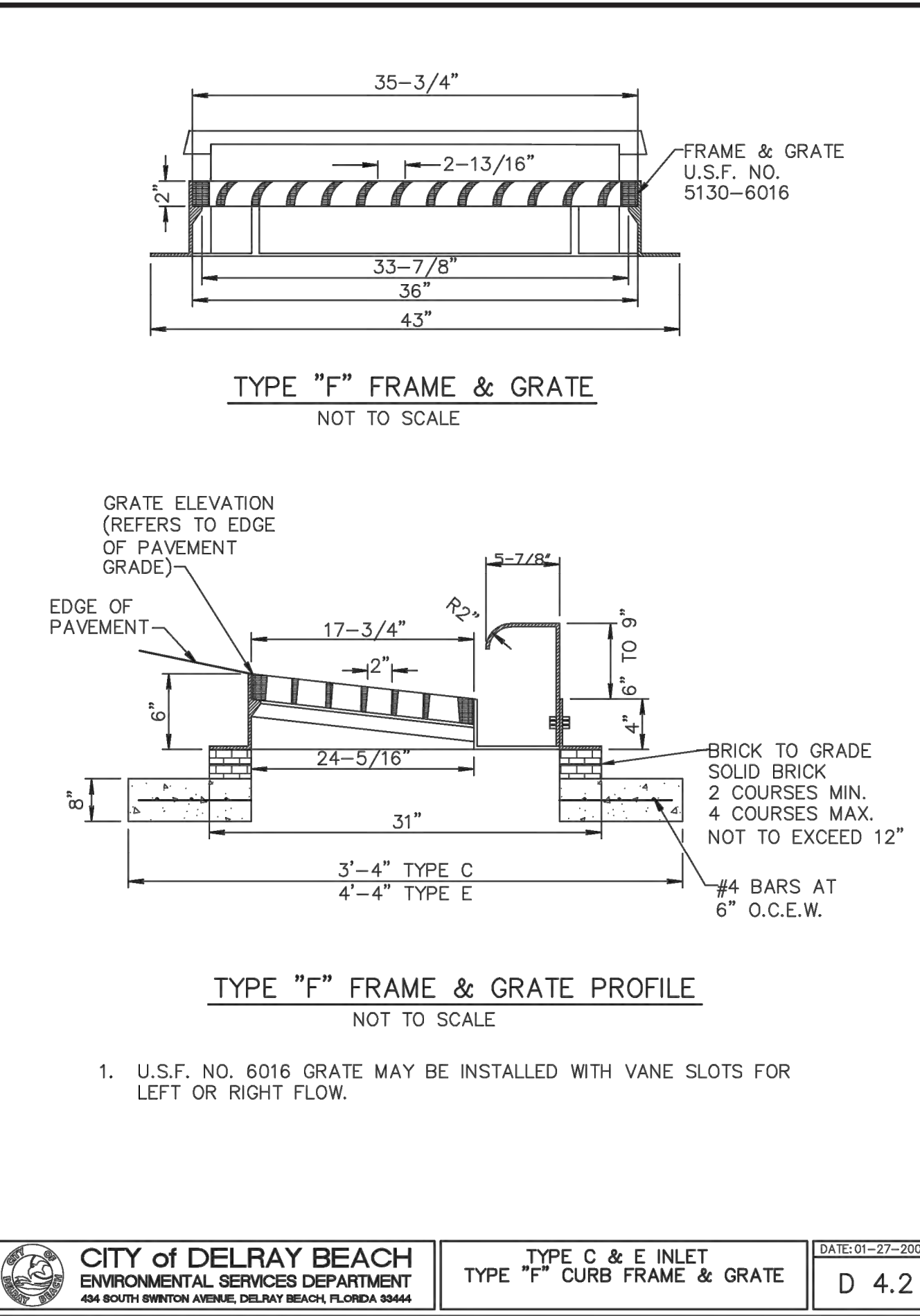
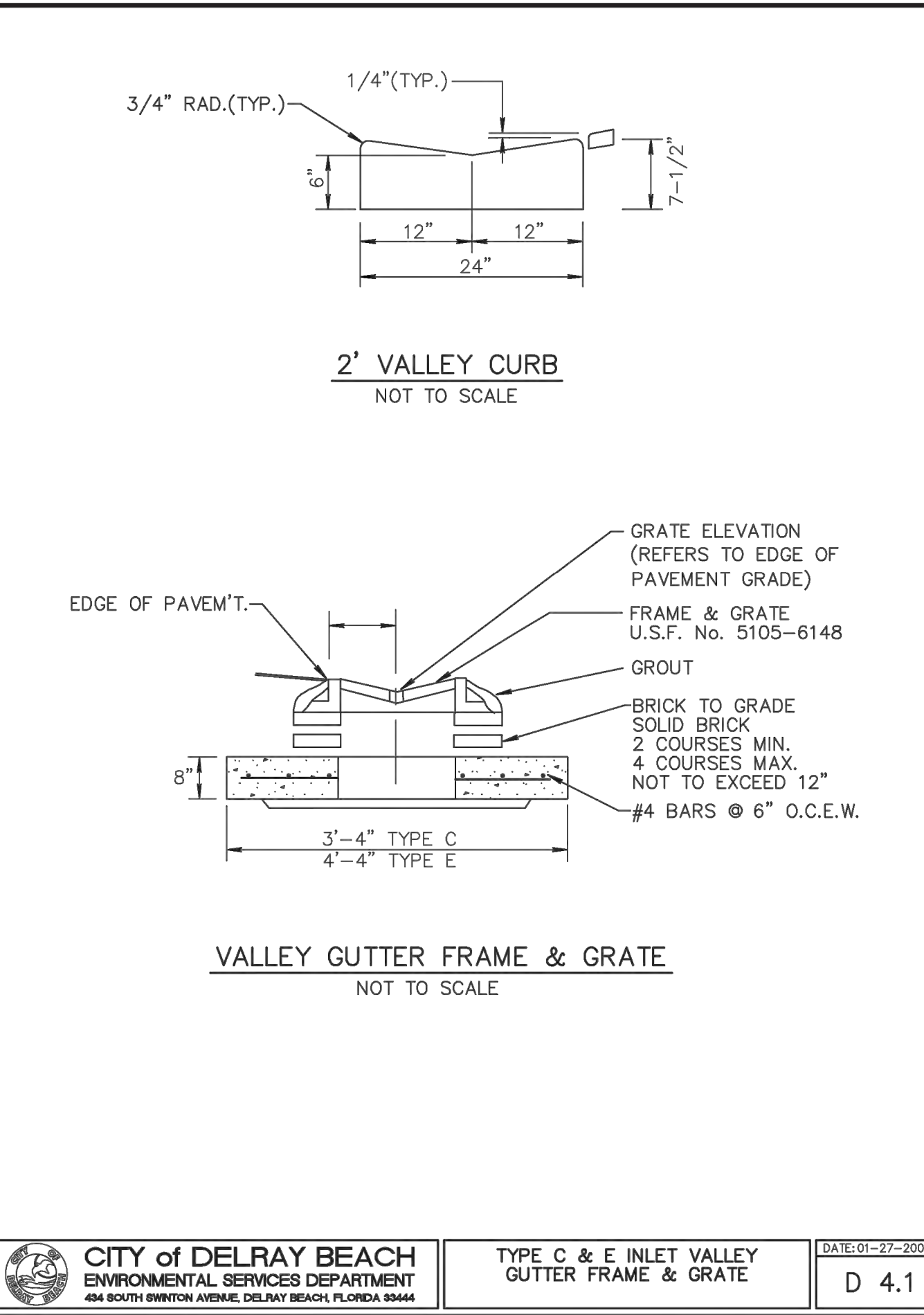
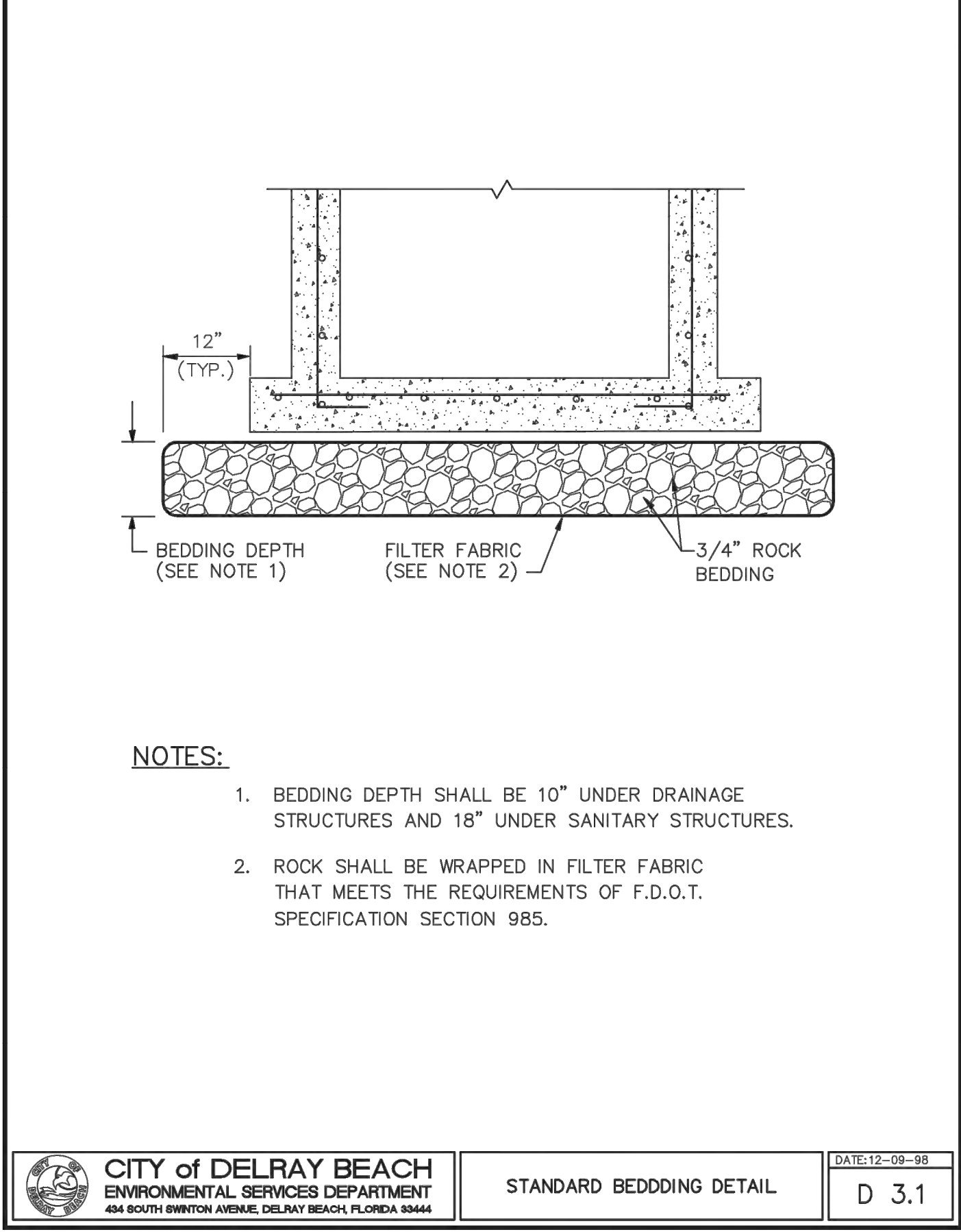
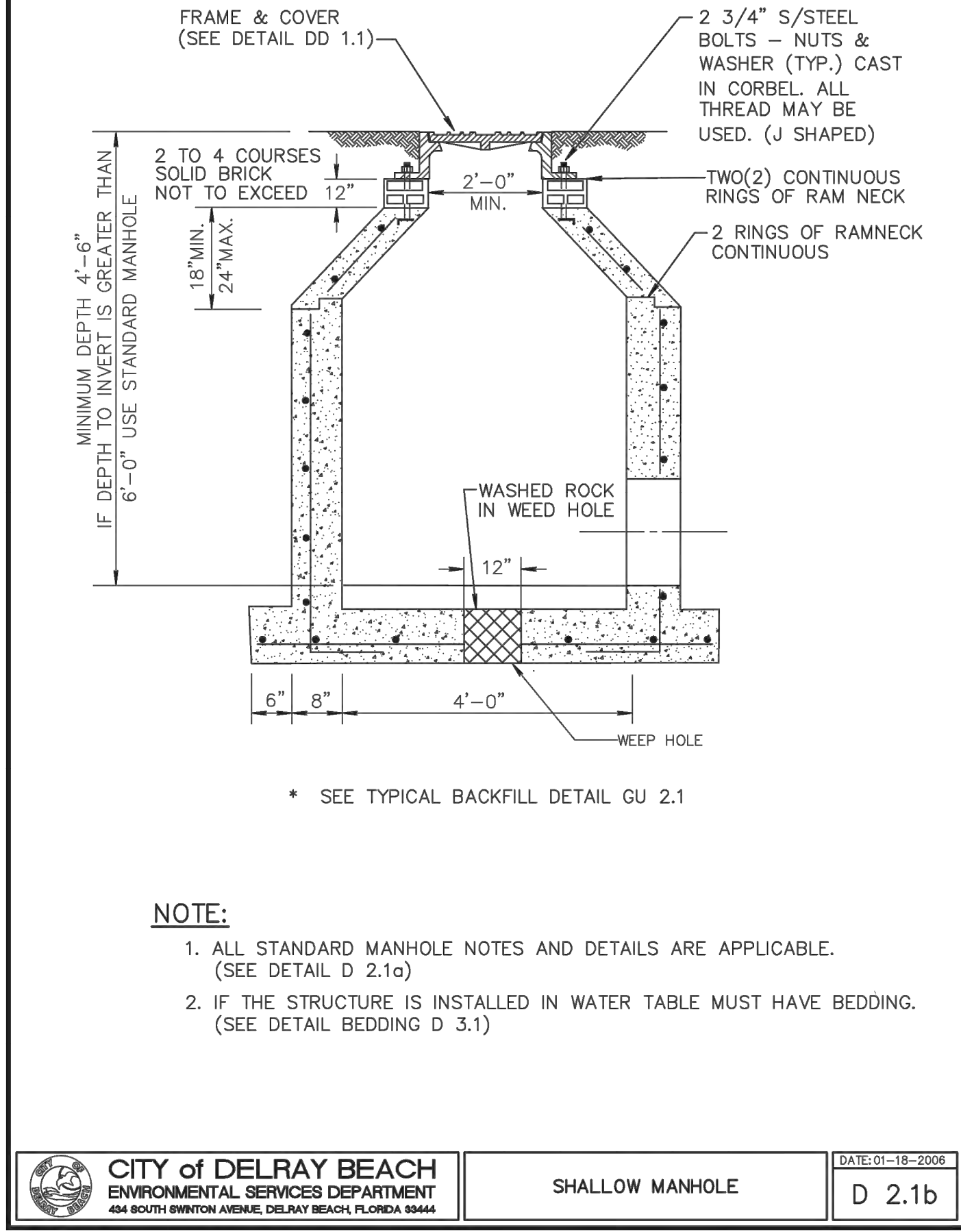
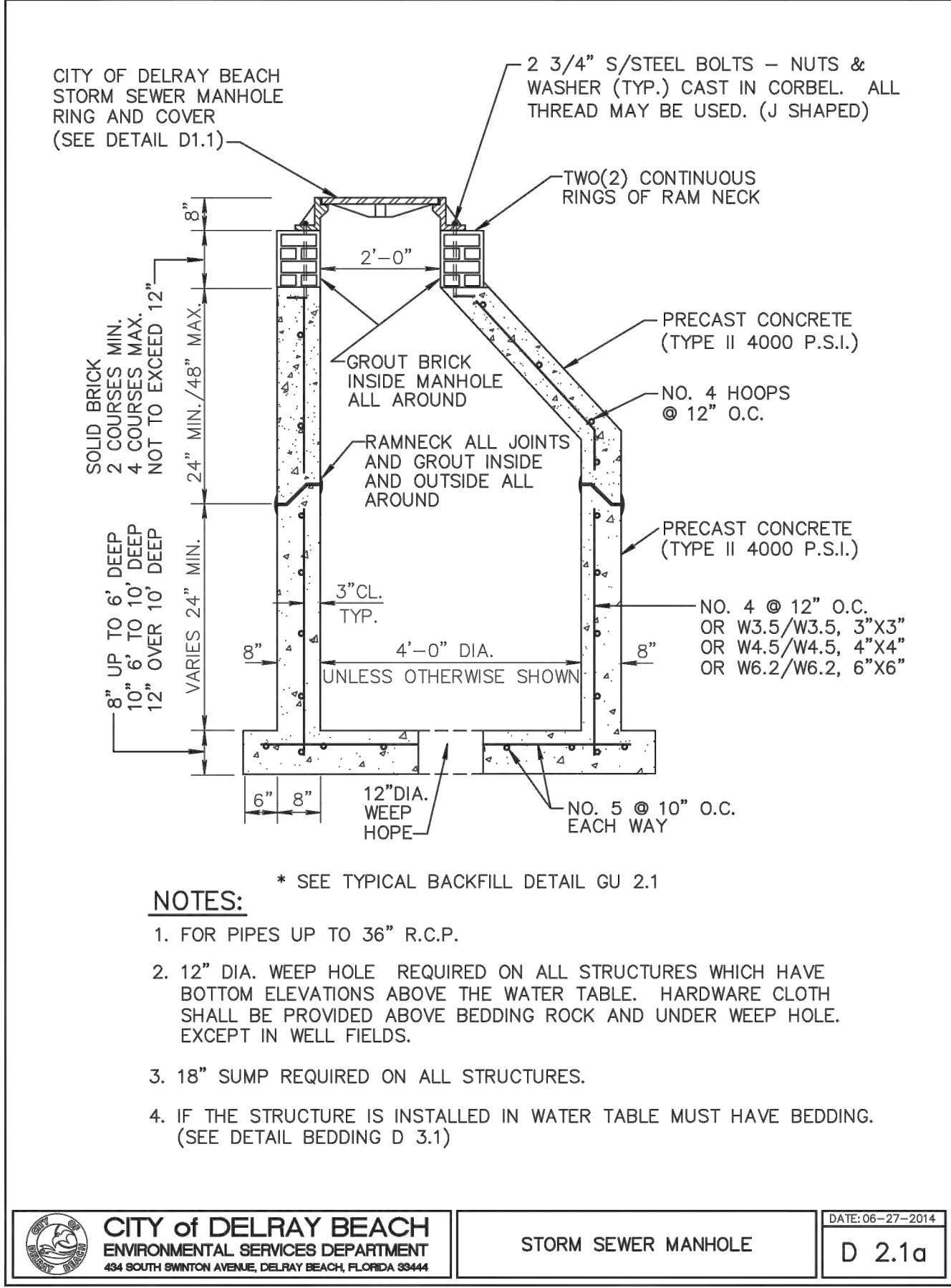
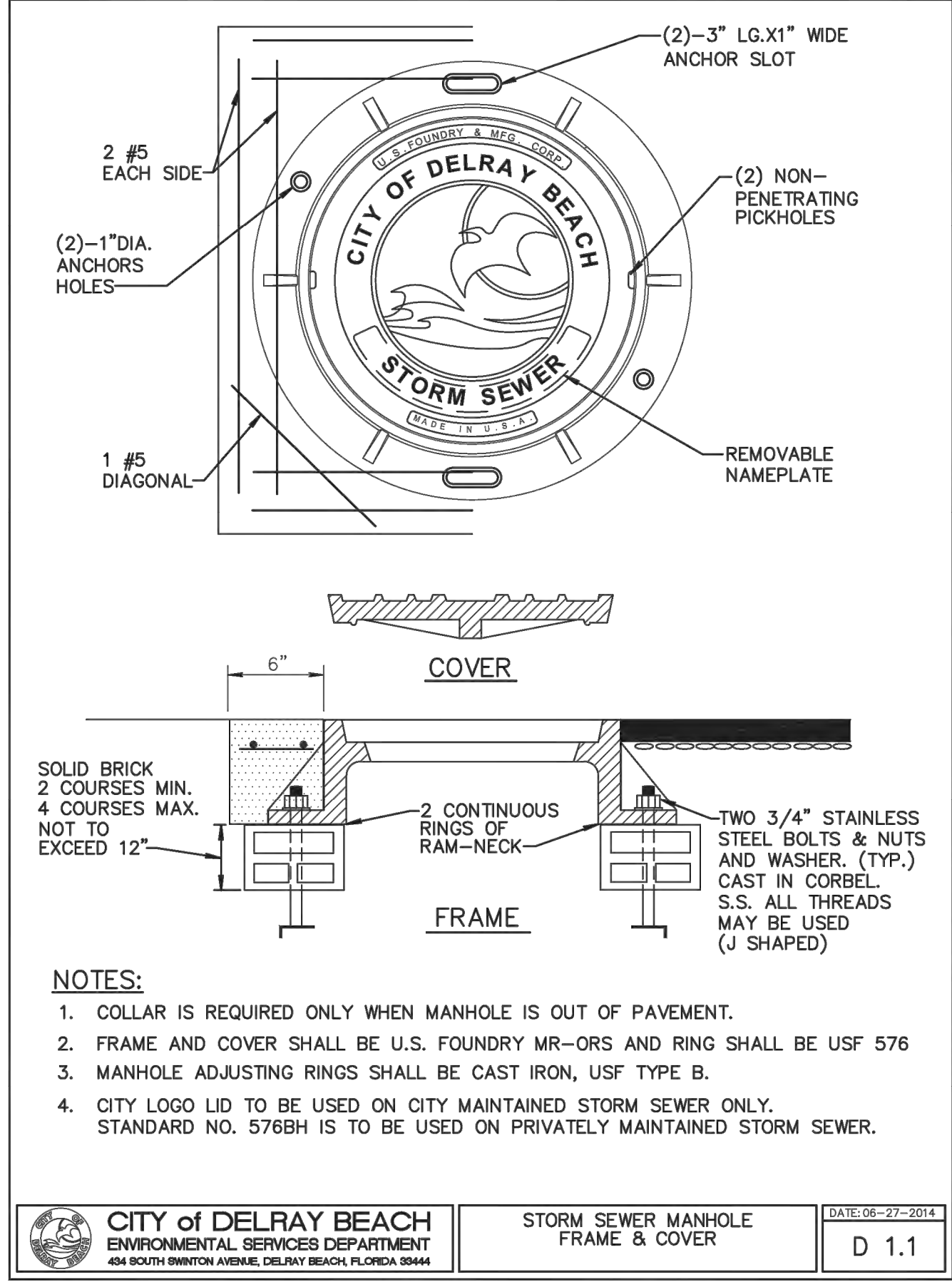
CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-1452

OCEAN DELRAY
PROPOSED
PAVEMENT, MARKING & SIGNAGE PLAN
DELRAY BEACH, FLORIDA

DATE 10/01/18
DRAWN BY MVK
F.B./ PG. ----
SCALE 1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
FOR THE FIRM -
DATE

JOB # 8296
SHT. NO.
PD-3
OF 15 SHEETS



CITY PROJECT NO.

REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK	BY
REVISED PER CITY COMMENTS	07/10/19	MVK	
REVISED PER ARCH CHANGES	11/16/18	MVK	
REVISIONS	DATE		
FILE NAME: 8298.ENG.dwg			

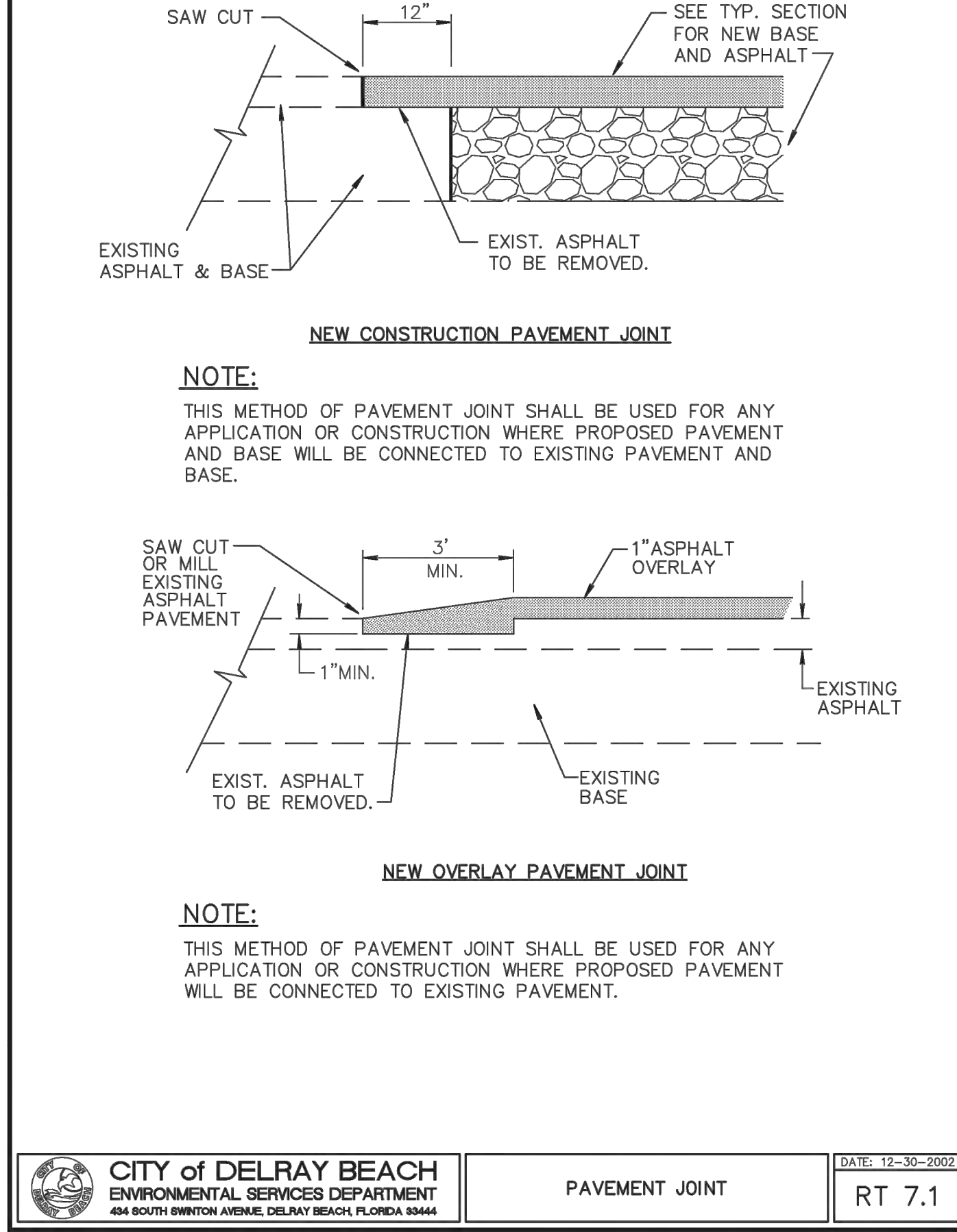
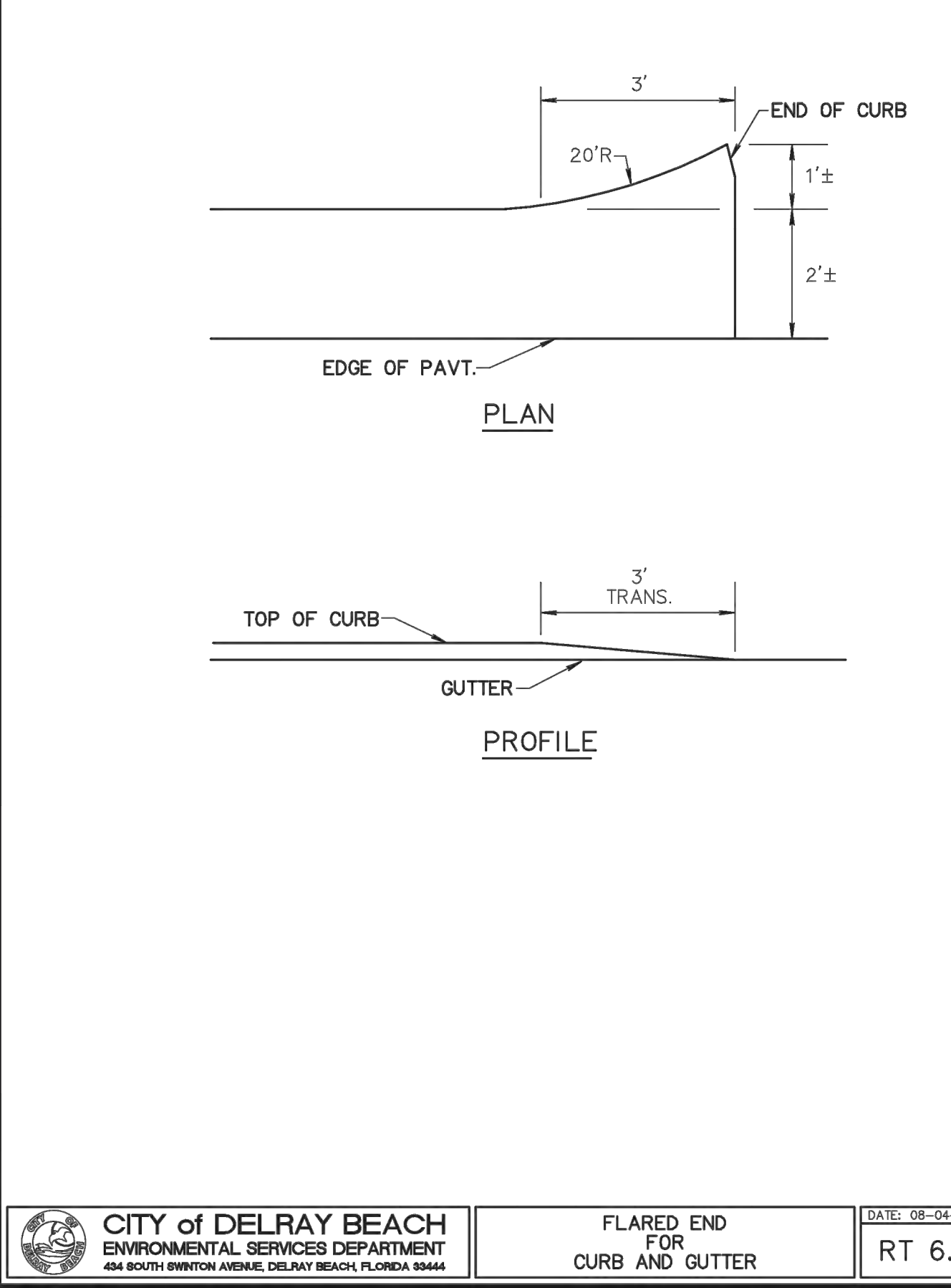
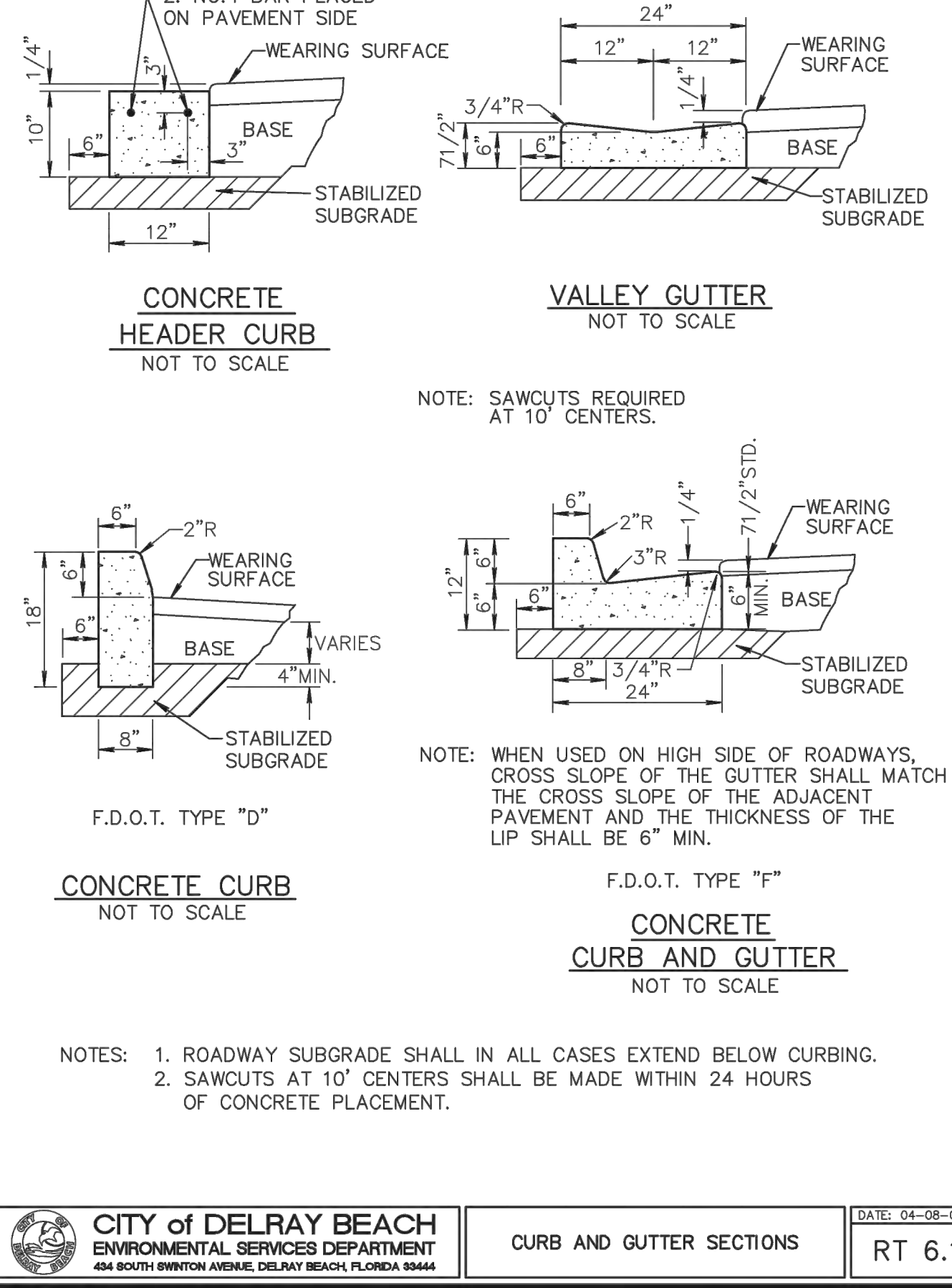
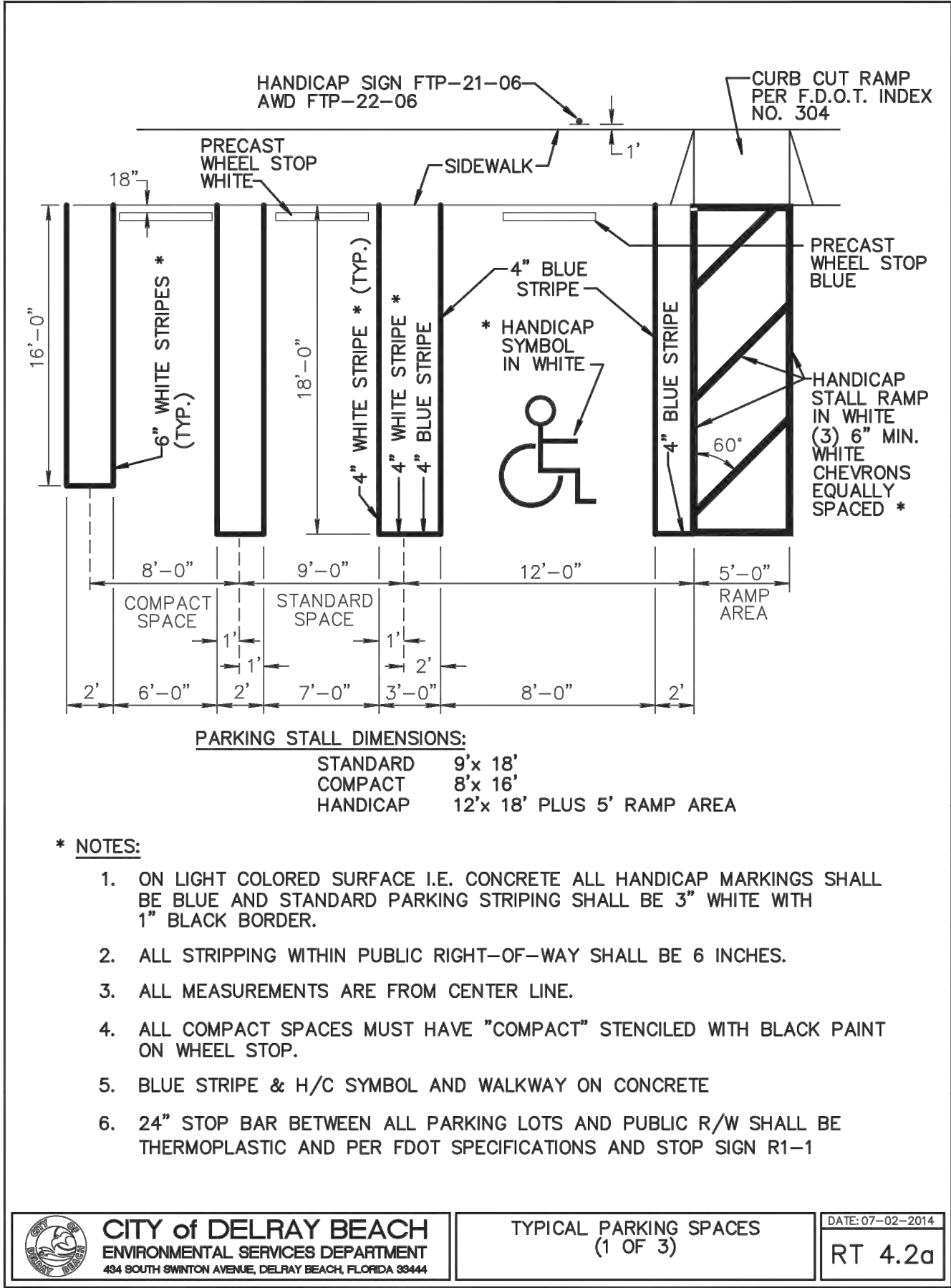
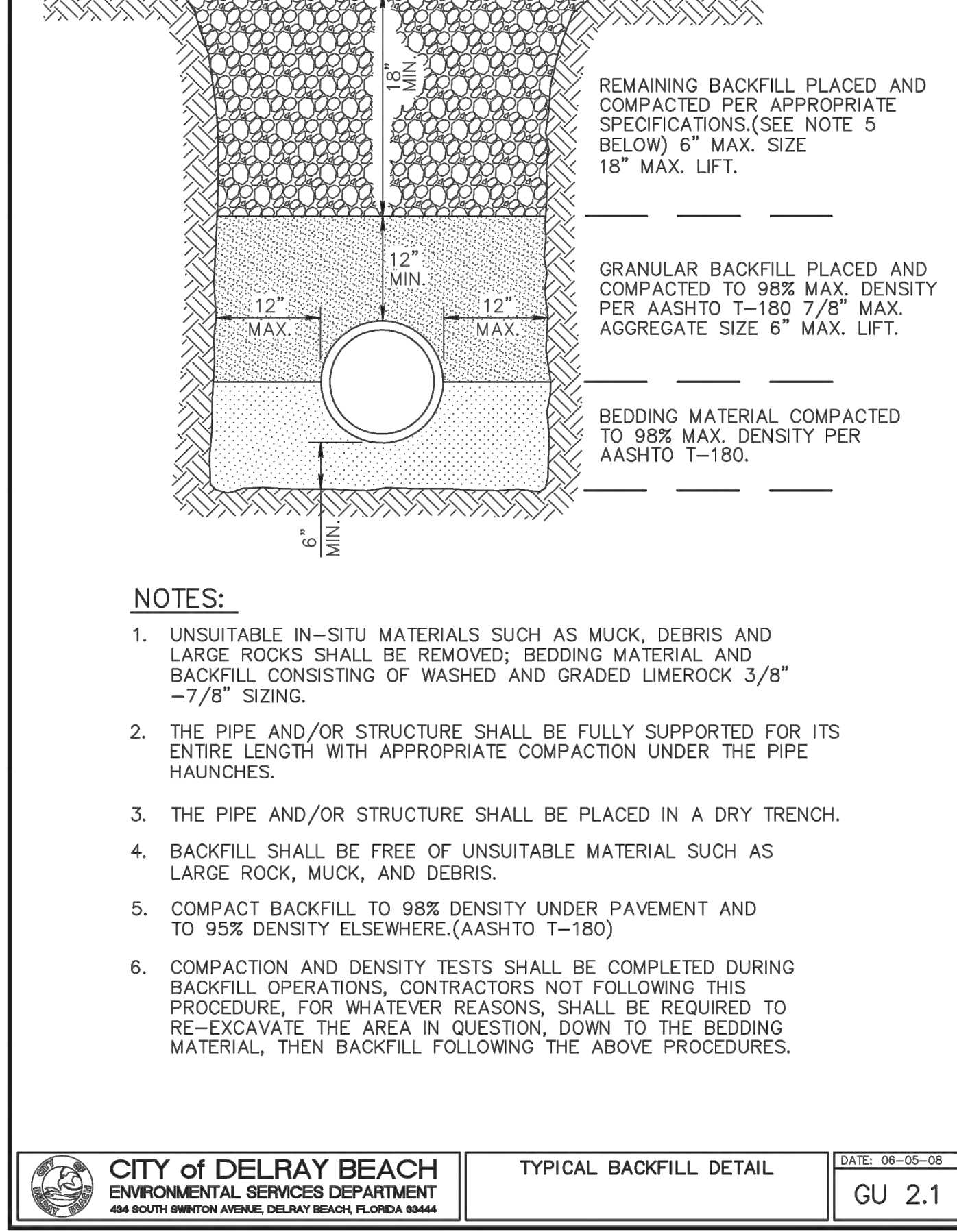
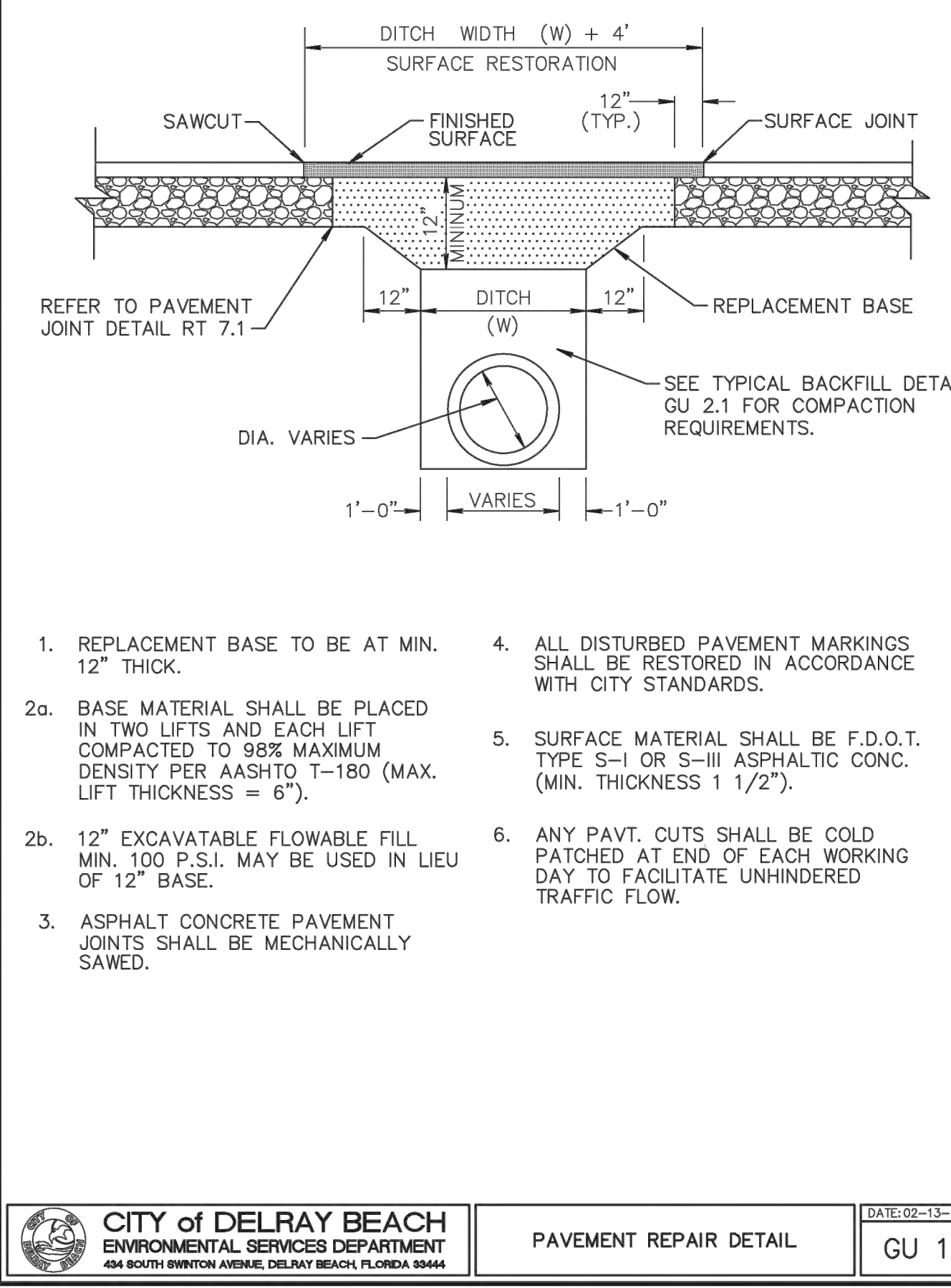
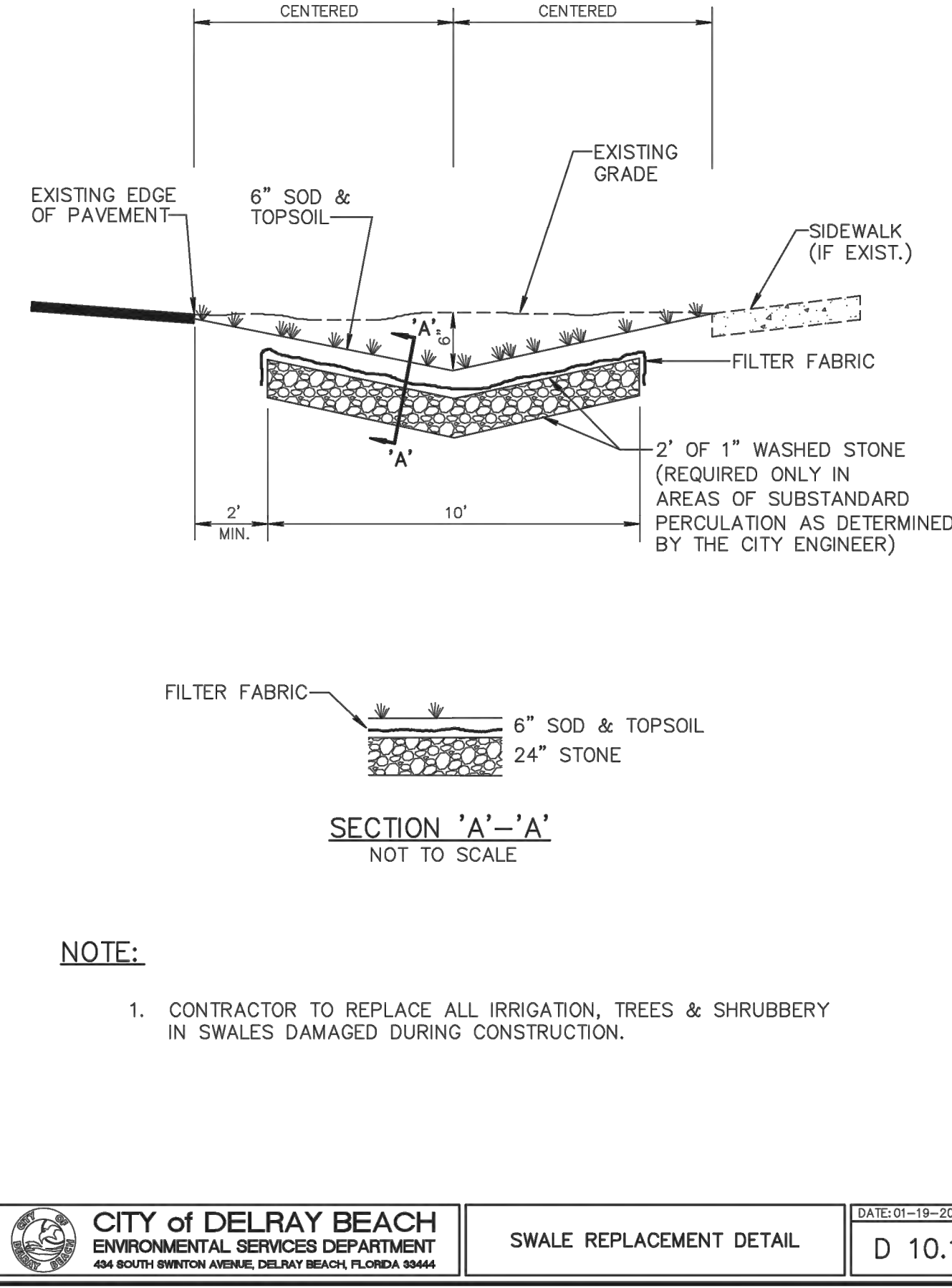
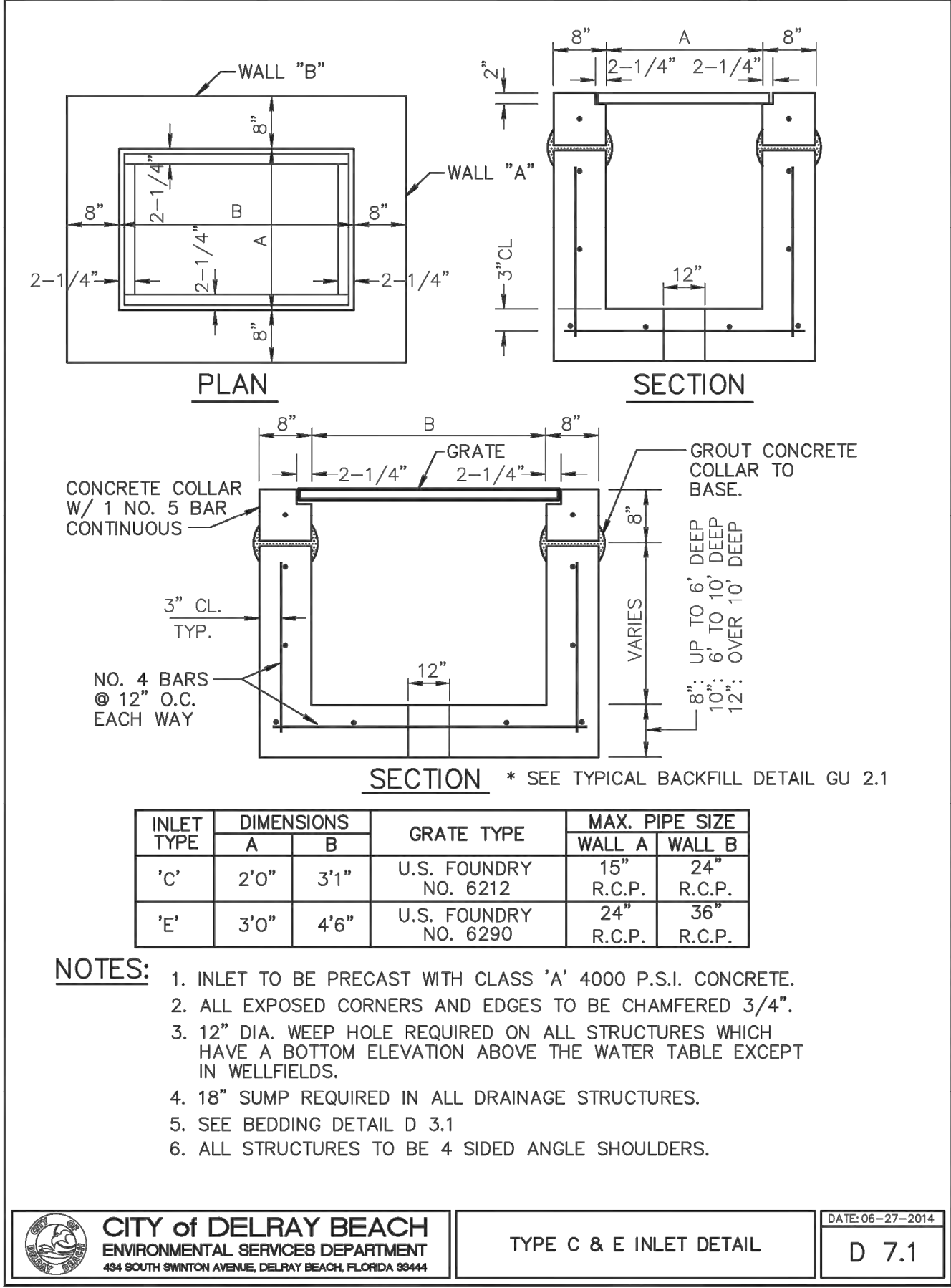
CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE - SURVEYING
9900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (305) 392-1991 / FAX (305) 750-1452

OCEAN DELRAY
PAVING, GRADING, &
DRAINAGE DETAILS
DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B./ PG.	----
SCALE	1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
FOR THE FIRM
DATE

JOB # 8296
SHT. NO.
PD-4
OF 15 SHEETS



CITY PROJECT NO.

REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK	BY
REVISED PER CITY COMMENTS	07/10/19	MVK	
REVISED PER ARCH CHANGES	11/16/18	MVK	
REVISIONS	DATE		

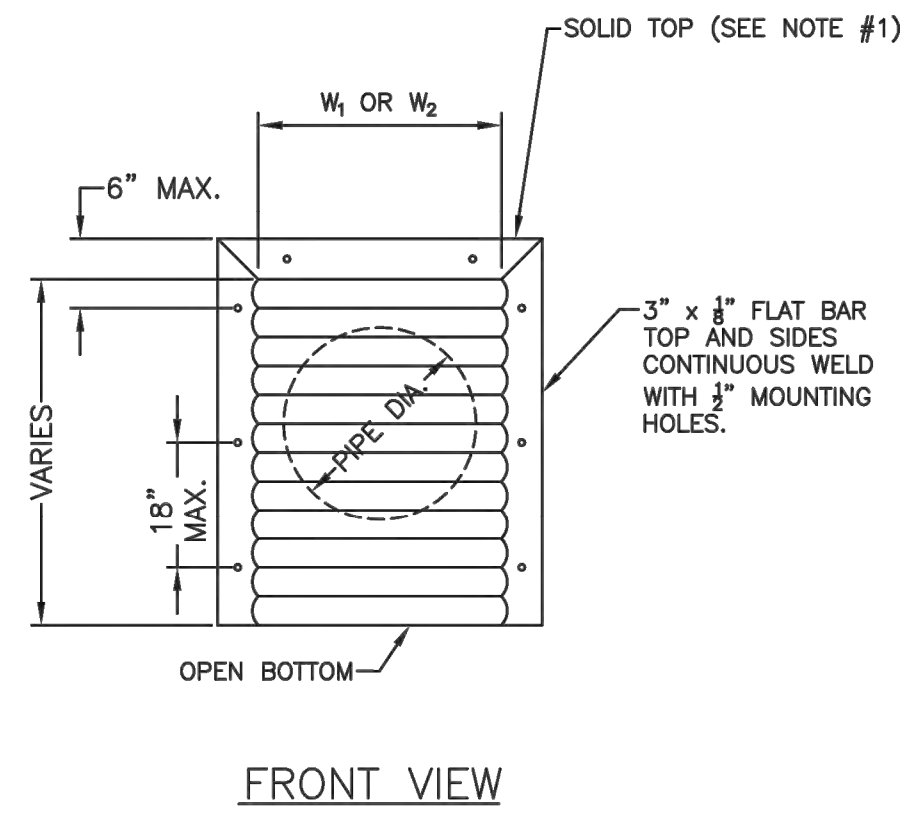
CAULFIELD & WHEELER, INC.
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LANDSCAPE ARCHITECTURE - SURVEYING
9900 GLADES ROAD - SUITE 100
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OCEAN DELRAY
PAVING, GRADING, &
DRAINAGE DETAILS
DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B./ PG.	----
SCALE	1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
FOR THE FIRM

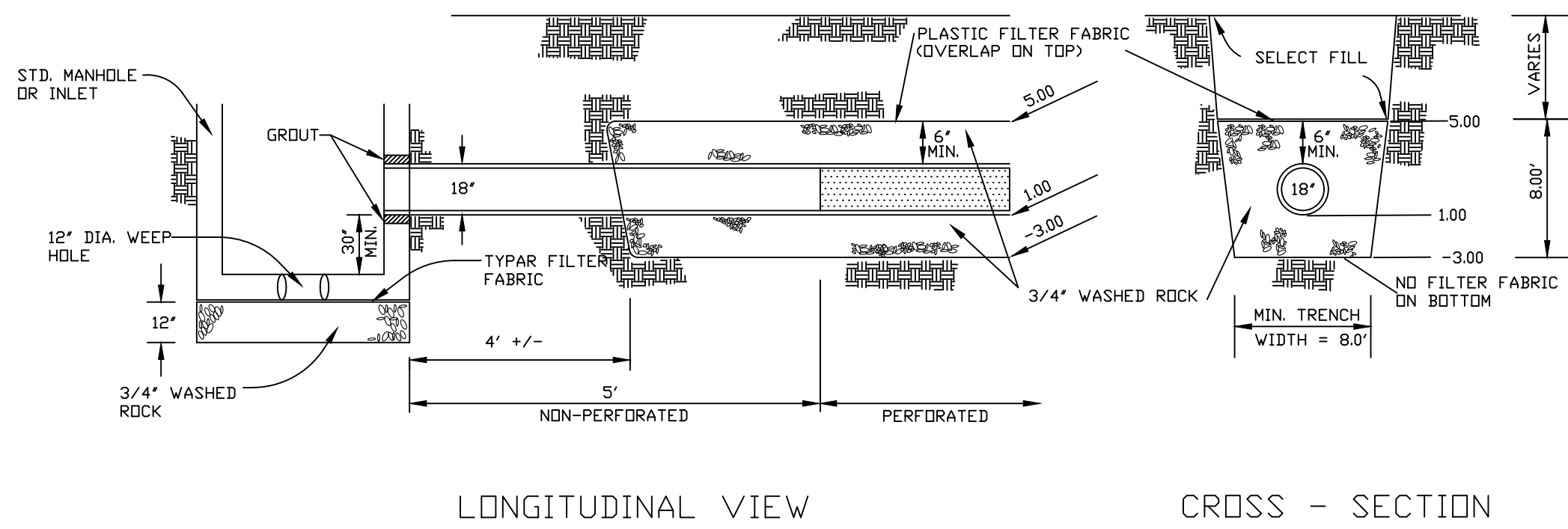
JOB # 8296
SHT. NO.
PD-5
OF 15 SHEETS



DISCHARGE PIPE DIAMETER	WEIR DIAMETER (W_1)	WEIR DIAMETER (W_2)	GAUGE (T)
15"	21"	21"	16
18"	24"	24"	16
24"	30"	36"	16
30"	36"	42"	14
36"	42"	48"	14
42"	48"	54"	14
48"	54"	60"	14
54"	60"	66"	14

- NOTES:**
1. ALUMINUM SHEET OF SAME THICKNESS (GAUGE) AS PIPE SHALL BE WELDED TO CLOSE THE OPENING AT THE TOP.
 2. NEOPRENE ADHESIVE BACKED GASKET, OR APPROVED EQUAL (1"x3") SHALL BE INSTALLED ON THE SIDES AND TOP OF ALL BAFFLES.
 3. POLLUTION RETARDANT BAFFLE TO BE FASTENED IN PLACE WITH 3/8" STAINLESS STEEL "RED HEADS," OR APPROVED EQUAL.
 4. MOUNTING BRACKETS MAY BE ADDED TO FLAT BARS TO EASE INSTALLATION IN ROUND STRUCTURES. SPACING TO MATCH HOLES IN FLAT BARS.

POLLUTANT RETARDANT BAFFLE DETAIL N.T.S.



- NOTES:

1. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT CONTAMINATION OF THE TRENCH BY SAND, SILT, OR OTHER MATERIAL.
2. THE CONTRACTOR SHALL INSTALL
 - A. PERFORATED RCP IN ACCORDANCE WITH F.D.D.T. REQUIREMENTS.
 - B. CORRUGATED ALUMINUM IN ACCORDANCE WITH F.D.D.T. REQUIREMENTS.
3. NO PIPE PERFORATIONS FOR THE FIRST 5 FEET FROM THE INLET OR MANHOLE.
4. PIPE PERFORATIONS SHALL BE PER FDDT REQUIREMENTS
5. SEE DETAILS OF MANHOLE AND/OR INLET FOR CONSTRUCTION DETAILS OF SAME.
6. PLASTIC FILTER FABRIC SHALL CONFORM TO D.D.T. SECTION 985 OR APPROVED EQUAL.
7. PRIOR TO BACKFILLING ANY DRAINAGE STRUCTURES, THE CITY ENGINEERING DEPARTMENT SHALL BE GIVEN 24 HOURS NOTICE IN ORDER TO SCHEDULE AN INSPECTION OF THE FACILITY.

FRENCH DRAIN DETAIL

N.T.S.

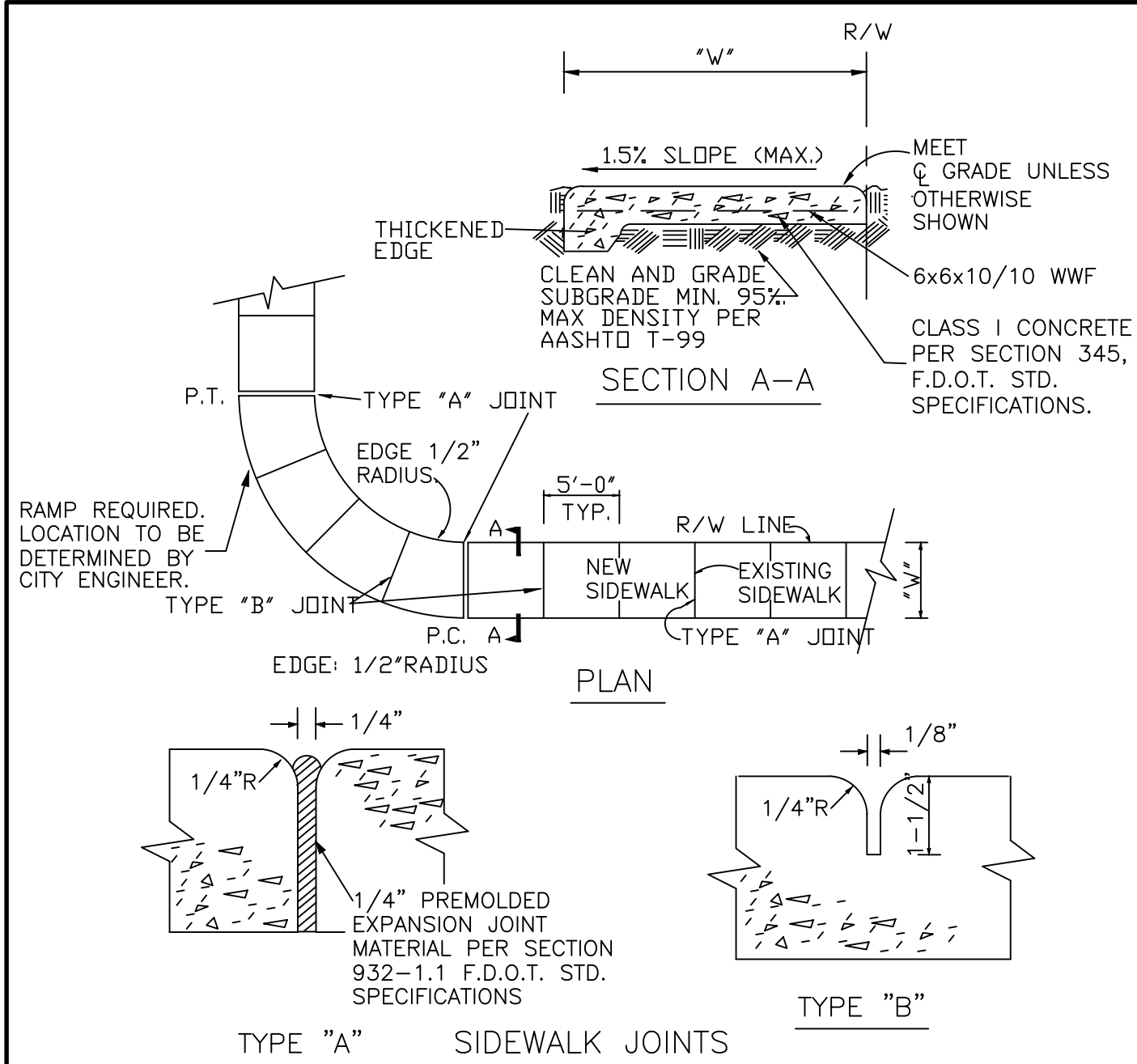
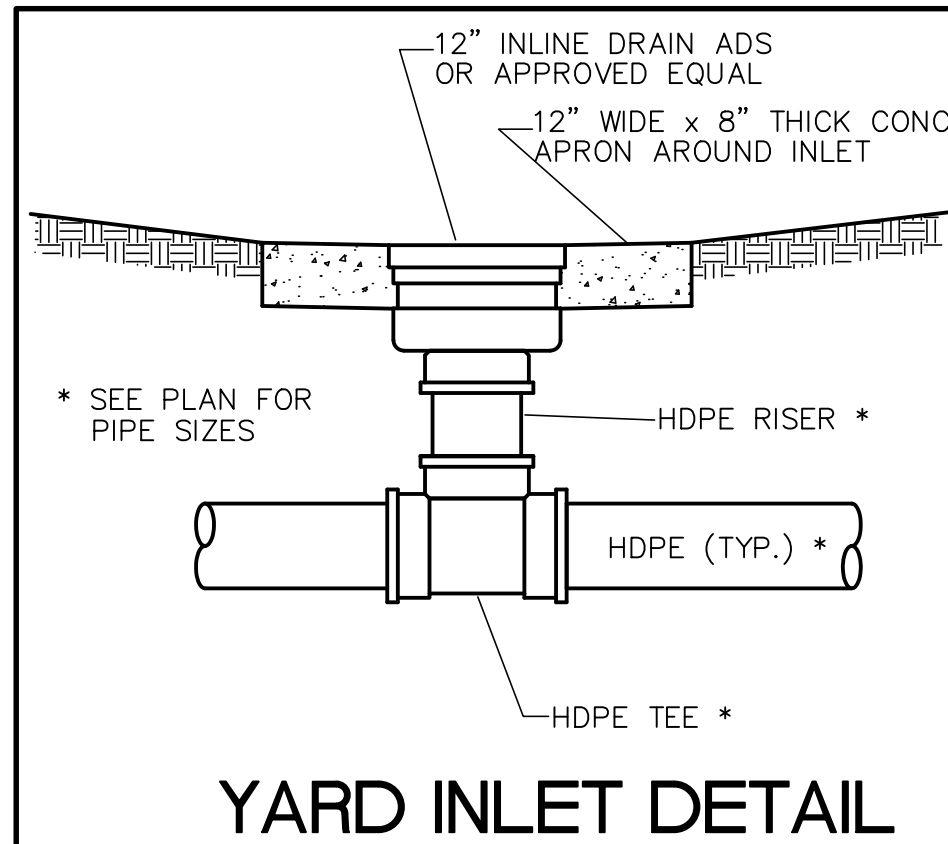
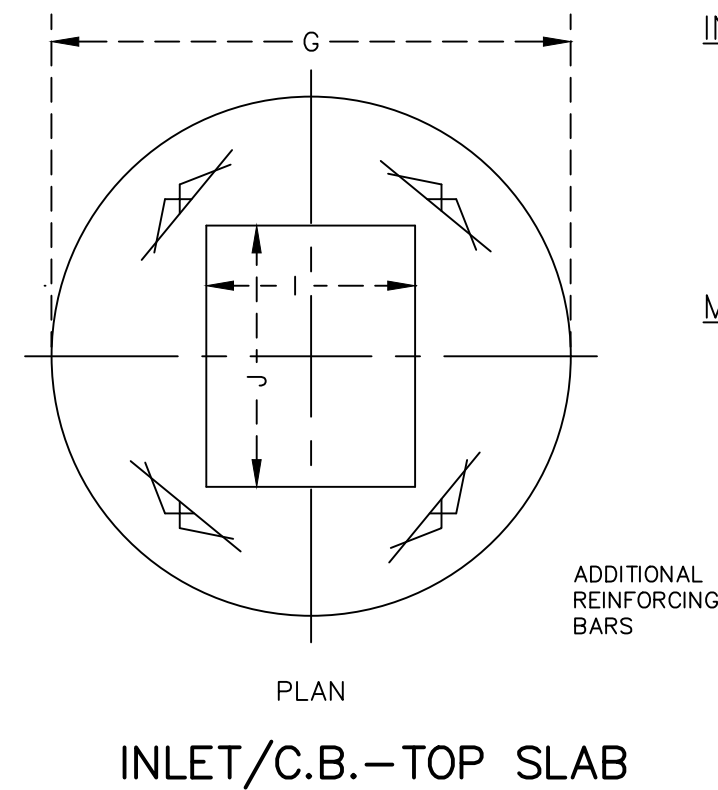


TABLE OF SIDEWALK THICKNESS — "T"	
RESIDENTIAL AREAS	4"
WITHIN 10' OF CROSS-STREETS, AT DRIVEWAYS & OTHER AREAS	6"
TABLE OF SIDEWALK WIDTHS — "W"	
SINGLE-FAMILY AREAS	6'
MULTI-FAMILY AREAS	6'
OTHER AREAS AS SPECIFIED BY THE ENGINEER.	

TABLE OF SIDEWALK JOINTS	
TYPE	LOCATION
"A"	P.C. AND P.T. OF CURVES JUNCTION OF EXISTING & NEW SIDEWALKS & EVERY 30'
"B"	5'-0" CENTER TO CENTER ON SIDEWALKS SCORED DURING PLACEMENT OR SAWCUT WITHIN 24 HOURS OF PLACEMENT.
"A"	WHERE SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS, AND SIMILAR STRUCTURES.

SIDEWALK CONSTRUCTION

n.t.s.



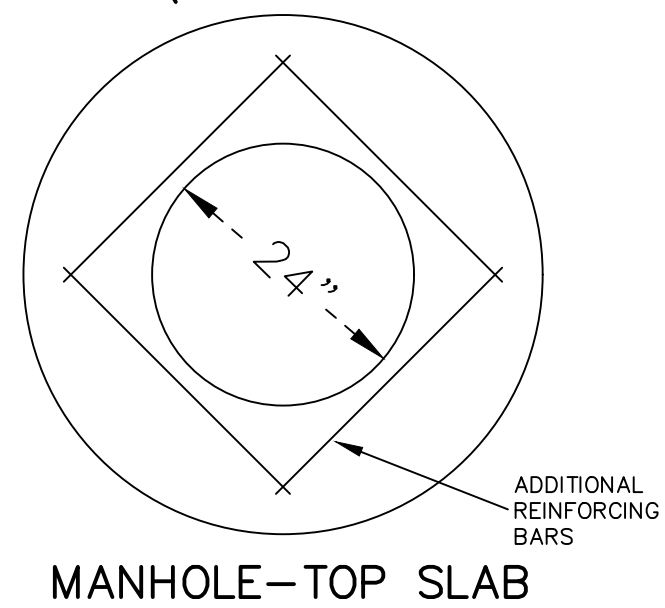
INLET OR CATCH BASIN (C.B.)

1. USF 4155-6210 (SOD/PAVEMENT)
2. USF 5113-6194 TYPE "II" (VALLEY GUTTER) ("V-G")
3. USF 5113-6194 TYPE "III" AND LARGER (VALLEY GUTTER) ("V-G")
4. USF 5130-6168 (CURB INLET) ("C-G")

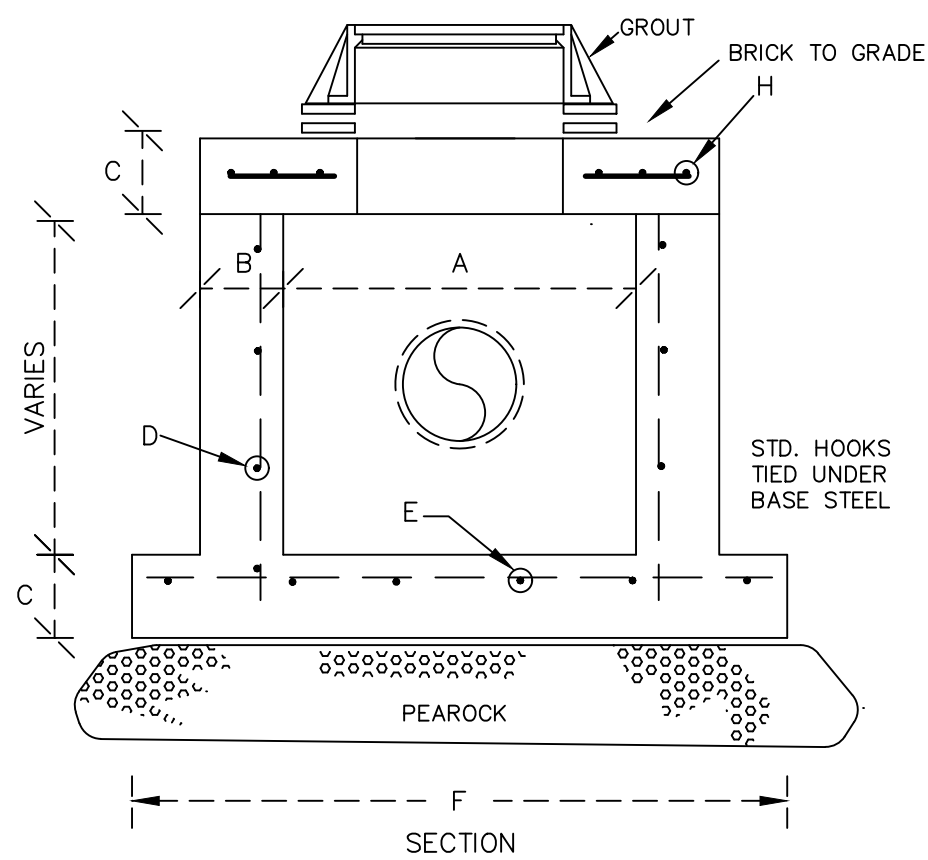
MAHHOLE

1. USF 420 - A

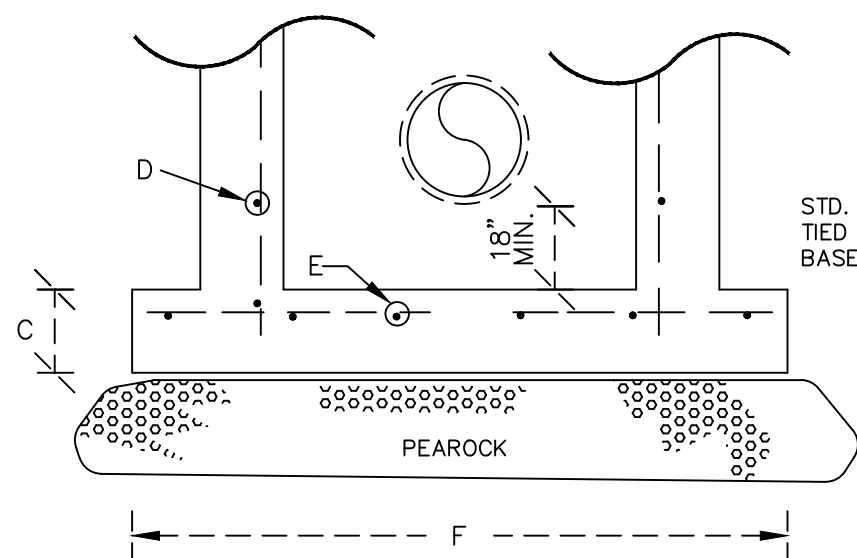
GRATES\RIMS



MANHOLE-TOP SLAB



PRECAST INLET TYPE II-IV



PRECAST CATCH BASIN TYPE II-IV

PIPE DIA.	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"
15"–24"	II	4'–0" Φ	8"	8"	#4 $\otimes$ 12" C.C.E.W.	#4 $\otimes$ 12" C.C.E.W.	6'–4" Φ	5'–4" Φ	#4 $\otimes$ 6" C.C.E.W.	22"	22"
30"–36"	III	5'–0" Φ	8"	8"	#5 $\otimes$ 12" C.C.E.W.	#5 $\otimes$ 12" C.C.E.W.	7'–4" Φ	6'–4" Φ	#5 $\otimes$ 8" C.C.E.W.	22"	46"
42"–48"	IV	6'–0" Φ	8"	10"	#5 $\otimes$ 12" C.C.E.W.	#5 $\otimes$ 6" C.C.E.W.	8'–4" Φ	7'–4" Φ	#5 $\otimes$ 6" C.C.E.W.	22"	46"
54"	V	8'–0" Φ	10"	10"	2-W.W.M. W/4 12" VERT	#5 $\otimes$ 6" C.C.E.W.	10'–8" Φ	9'–8" Φ	#5 $\otimes$ 6" C.C.E.W.	22"	46"

CITY PROJECT NO.

[illegible]

CAULFIELD & WHEELER, INC.



**OCEAN DELRAY
PAVING, GRADING, &
DRAINAGE DETAILS**
DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B./ PG.	----
SCALE	1"= 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
- FOR THE FIRM -
DATE

JOB # 8296
SHT.NO. PD-7
OF 15 SHEETS

LEGEND

- PROPERTY/ROW LINE
PROPOSED PIPE AND CATCH BASIN
EXISTING GRADE
PROPOSED WATER LINE
EXISTING WATER LINE
PROPOSED SANITARY SEWER LINE
EXISTING SANITARY SEWER LINE
PROPOSED ELECTRIC LINE
EXISTING OVERHEAD LINE
PROPOSED TELEPHONE/CABLE LINE
EXISTING TELEPHONE/CABLE LINE
PROPOSED GAS LINE
EXISTING GAS LINE

- PROPOSED CONCRETE (4")
PROPOSED PAVER DRIVEWAY
PROPOSED PAVER WALKWAY
PROPOSED BUILDING
PROPOSED FILL EAST OF THE CCCL
PROPOSED CUT EAST OF THE CCCL



REVISED PER CITY & DEP SUBMISSION	02/05/19	MVK	BY
REVISED PER CITY COMMENTS	01/10/19	MVK	
REVISED PER ARCH CHANGES	11/16/18	MVK	
REVISIONS	DATE		
FILE NAME: 8296_RWG.dwg			

CAULFIELD 8 WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-1452

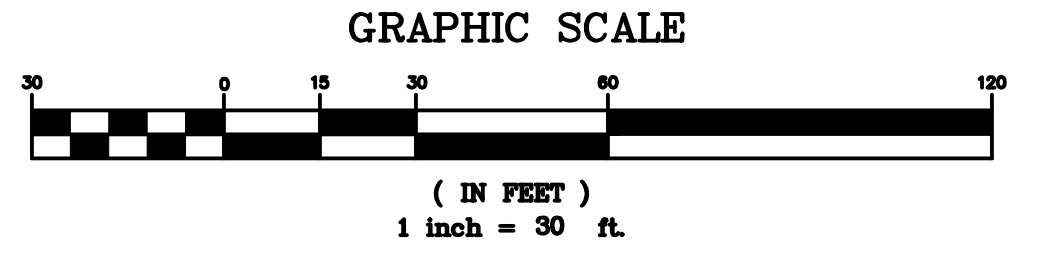
OCEAN DELRAY
PROPOSED WATER DISTRIBUTION,
SANITARY SEWER & UTILITY PLAN
DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B./ P.G.	----
SCALE	1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
- FOR THE FIRM -
DATE

JOB # 8296
SHT. NO.
WS-1
OF 15 SHEETS

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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.a. DUCTILE IRON PIPE (DIP) FOR FORCE MAINS SHALL BE CLASS 350 EPOXY LINED IN ACCORDANCE WITH AWWA C550.
- 2.b. 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.
3. C-900 PVC PRESSURE PIPE MAY BE USED IN LIEU OF DIP WATER MAIN METAL TAPE ABOVE C-900
4. ALL FITTINGS SHALL BE CLASS 350 DUCTILE IRON WITH MECHANICAL JOINTS AND EPOXY LINING.
5. 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
6. ALL TRENCHING, PIPE-LAYING, BACKFILL, PRESSURE TESTING, AND DISINFECTION MUST COMPLY WITH CITY AND HEALTH DEPARTMENT STANDARDS.
7. 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 ANSI/AWWA C600 LATEST STANDARDS. ALLOWABLE LEAKAGE SHALL BE DETERMINED AS FOLLOWS:

$$L = \frac{(S)(D)(P)^{0.50}}{148,000} X(.50)$$

WHERE:

L = ALLOWABLE LEAKAGE (GALLONS PER HOUR)
S = PIPE LENGTH (FEET)
D = NOMINAL DIAMETER OF PIPE (INCHES)
P = AVERAGE TEST PRESSURE (PSI)

8. RESTRAINTS SHALL BE PROVIDED AT ALL FITTINGS AS SHOWN ON PP.2.1
9. PRIOR TO ANY TESTING UNDER FUTURE PAVEMENT, ROCK SHALL BE FINISHED & PRIMED OR 1ST LIFT OF ASPHALT PLACED.
10. PIG SIZE SHALL BE PIPE DIA. PLUS 2" OR NEXT LARGER DIA.
11. NO PROPOSED STRUCTURES SHALL BE INSTALLED WITHIN A HORIZONTAL DISTANCE OF 10'-FEET FROM ANY EXISTING OR PROPOSED WATER MAINS, OR FORCE MAINS.
12. LINE STOPS SHALL BE INSTALLED A MINIMUM OF 3 PIPE LENGHTS FROM LOCATION OF PIPE REMOVED, OTHERWISE, PROVIDE NECESSARY JOINT RESTRAINTS.

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PRESSURE PIPE NOTES

PP 1.1

DATE: 06-27-2014

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	266	
	LOWER BEND	22	38	49	59	69	88	106	123	
45° VERT. OFFSET	UPPER BEND	22	32	42	51	60	77	93	109	
	LOWER BEND	10	14	19	23	28	35	43	50	
22.5° VERT. OFFSET	UPPER BEND	7	12	17	21	26	34	42	49	
	LOWER BEND	2	4	6	8	10	14	17	21	
11.25° VERT. OFFSET	UPPER BEND	3	4	6	9	11	15	19	22	
	LOWER BEND	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"xX0	23								
	6"xX0	21	35							
	8"xX0	18	34	47						
	10"xX0	16	32	46	58					
	12"xX0	13	30	44	57	69				
	16"xX0	7	26	41	55	67	90			
	20"xX0	1	21	38	52	65	88	109		
REDUCER (LARGER PIPE RESTRAINT)	24"xX0	1	16	34	49	62	86	108	129	
	6"xX0	23								
	8"xX0	38	25							
	10"xX0	57	43	24						
	12"xX0	72	60	44	41					
	16"xX0	99	90	78	75	45				
	20"xX0	123	116	107	105	81	45			
	24"xX0	146	140	132	131	111	82	45		

RESTRAIN PIPE ONE BELL PAST MINIMUM DISTANCE

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

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

PP 2.1a

DATE: 08-01-2011

NOTES:

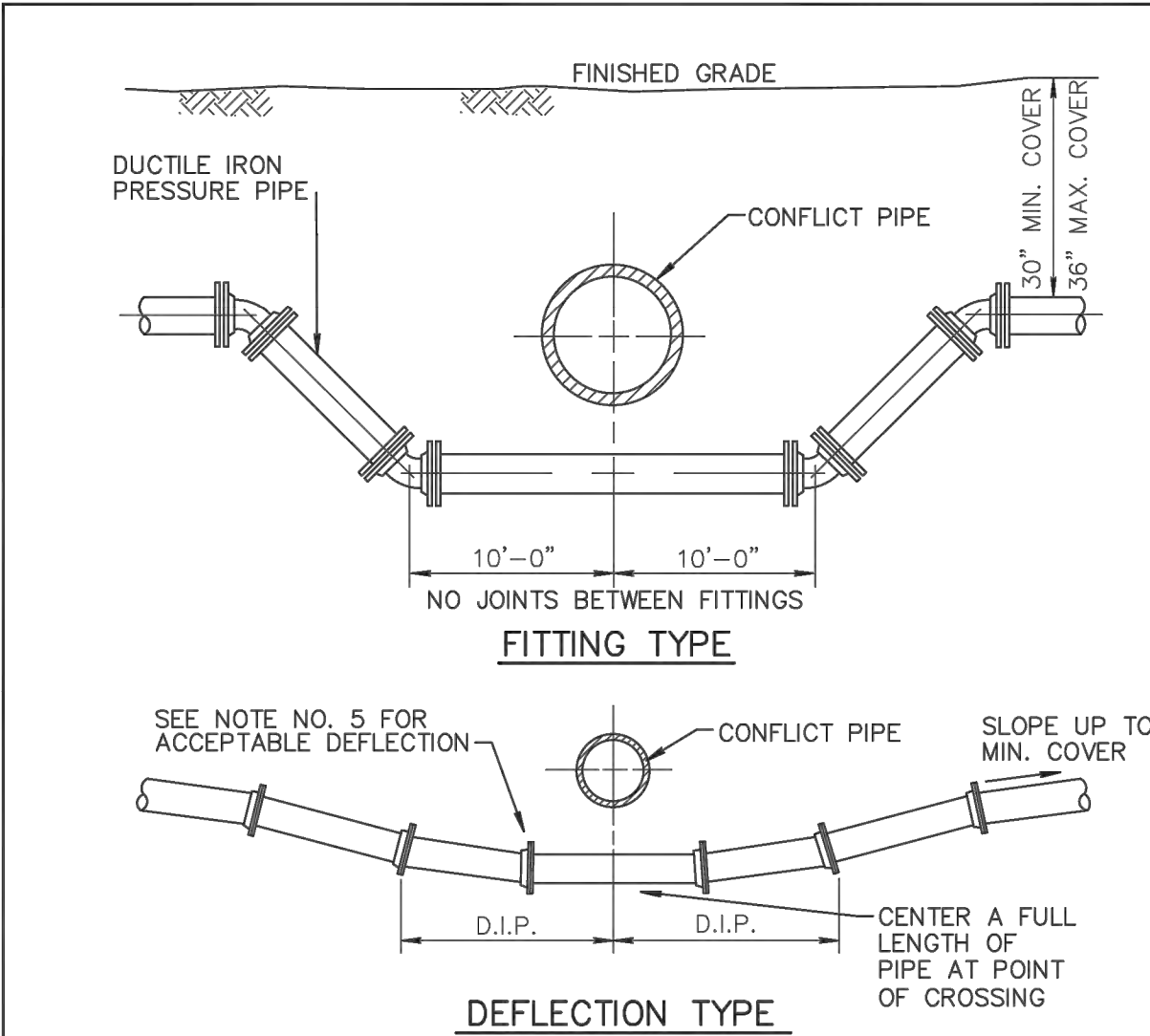
1. THE DATA IN THE PREVIOUS TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
- SOIL TYPESAND
TEST PRESSURE150 PSI, 200 PSI FOR PIPES LARGER THAN 24"
DEPTH OF BURY3'
TRENCH TYPE1.3
SAFETY FACTOR1.5
VERTICAL OFF-SET3'
MINIMUM PIPE LENGTHS
ALONG TEE RUN5'
2. THE RESTRAINED PIPE LENGTHS APPLY 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 SERVCE 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. RESTRAIND JOINTS SHALL EXTEND ONE JOINT BEYOND MIN. LENGTH REQUIRED.

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

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

PP 2.1b

DATE: 08-01-2011



NOTES:

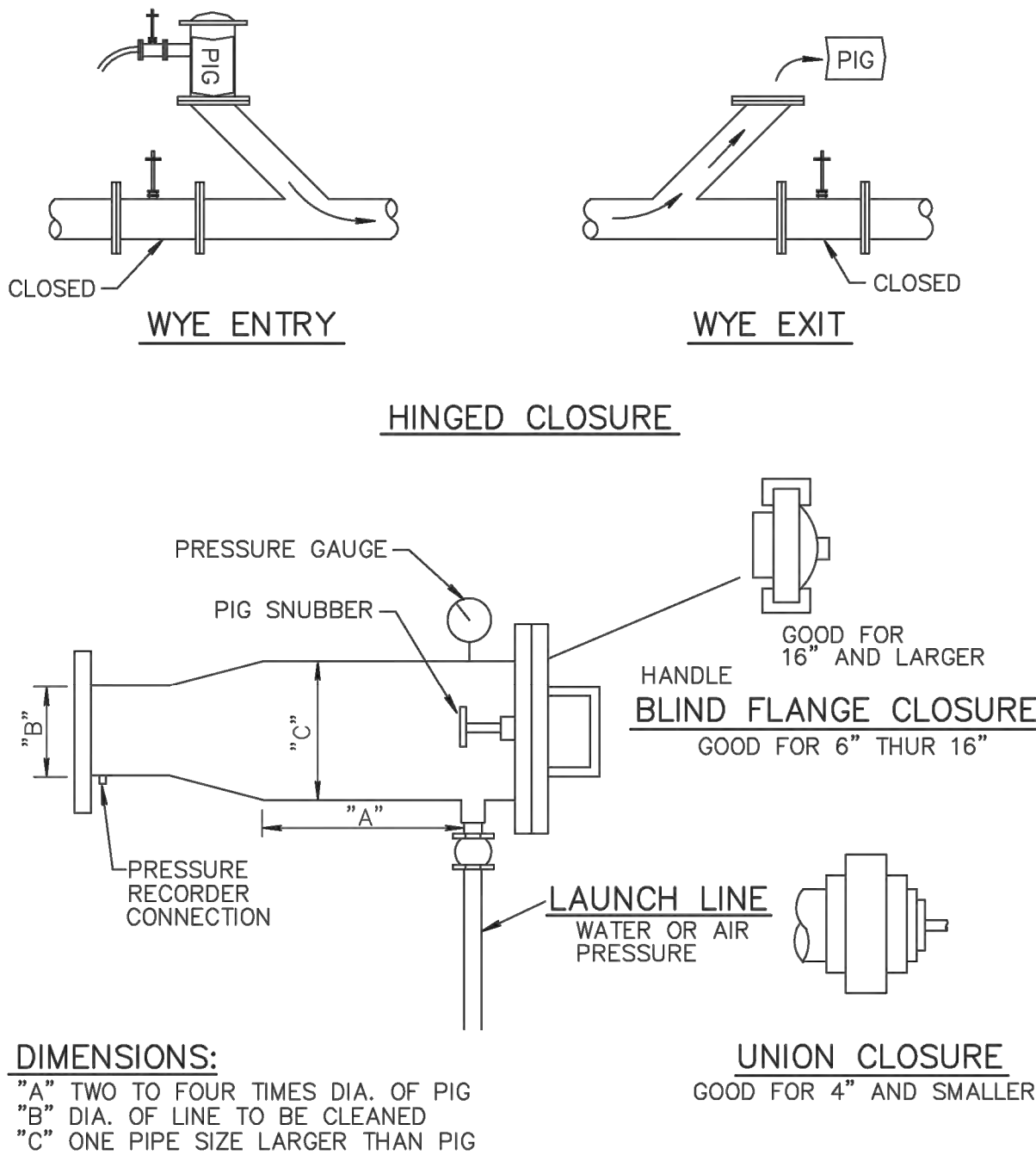
1. THERE SHALL BE IN ALL CASES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN WATER MAINS AND FORCE MAINS.
2. WHEREVER POSSIBLE WATER MAINS SHALL PASS OVER FORCE MAINS OR STORM SEWERS.
3. FITTINGS SHALL BE RESTRAINED WITH MECHANICAL JOINT RESTRAINTS.
4. THE DEFLECTION TYPE CROSSING IS PREFERRED.
5. DO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

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PRESSURE PIPE
CONFLICT DETAIL

PP 3.1

DATE: 07-01-2014



DIMENSIONS:

"A" TWO TO FOUR TIMES DIA. OF PIG
"B" DIA. OF LINE TO BE CLEANED
"C" ONE PIPE SIZE LARGER THAN PIG

UNION CLOSURE

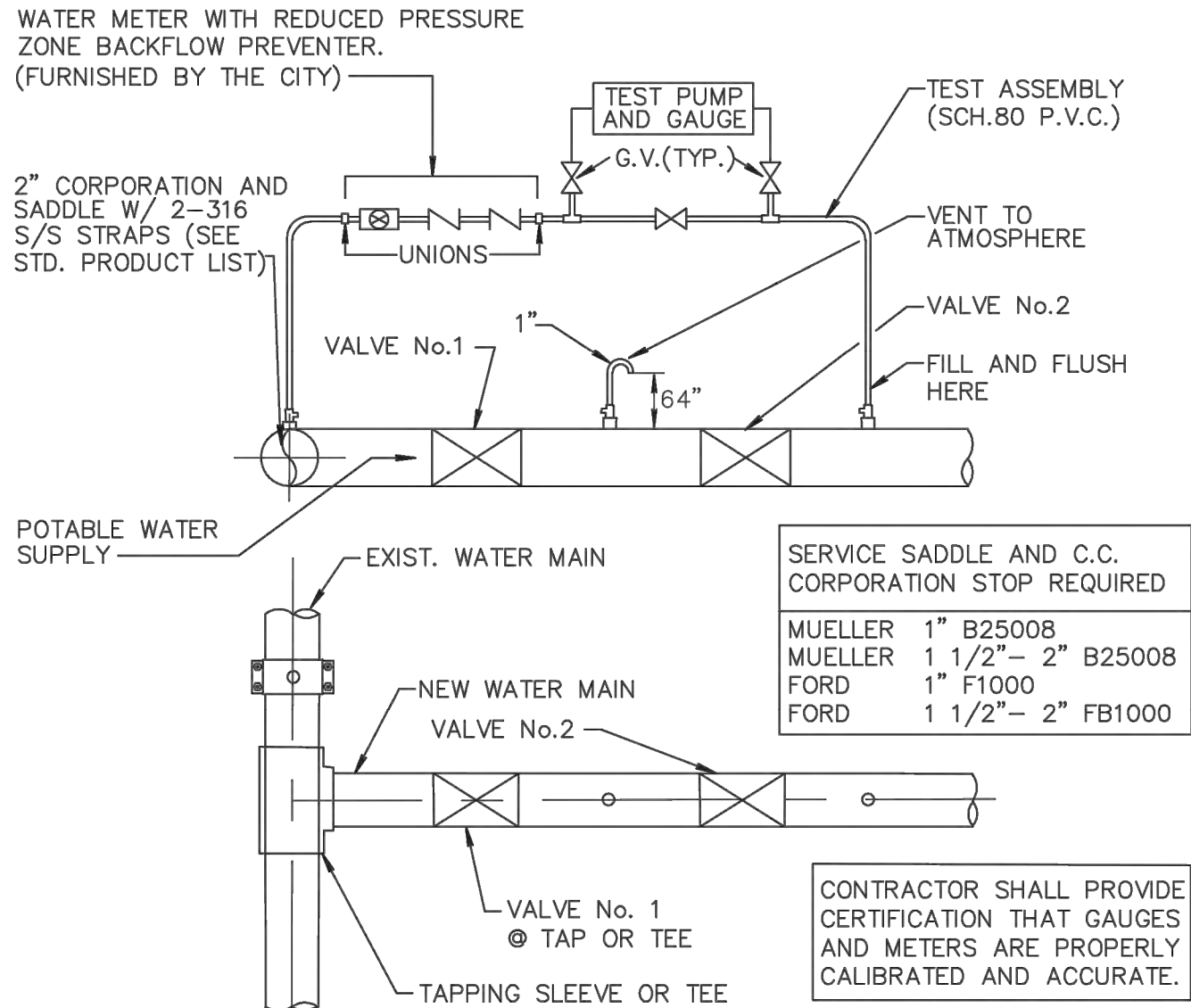
GOOD FOR 4" AND SMALLER

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

PIG LAUNCHER DETAIL

PP 5.1

DATE: 04-12-08



NOTES:

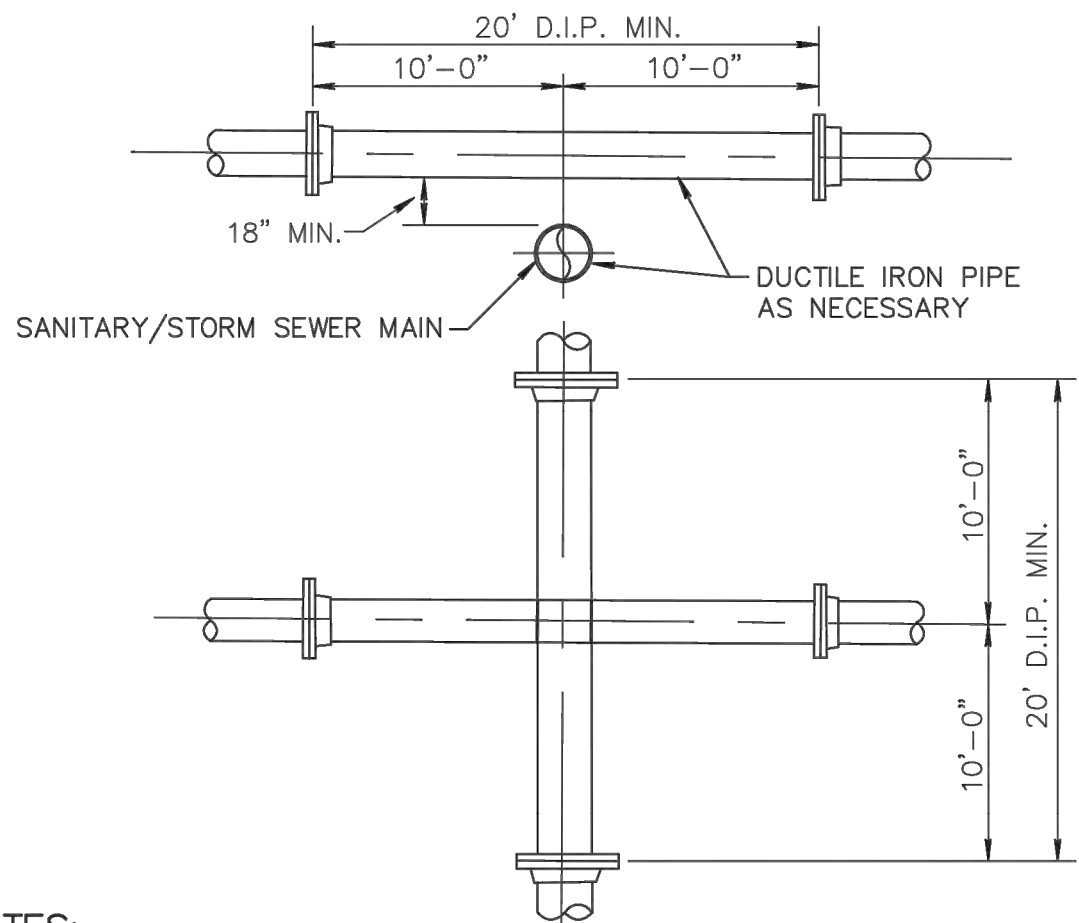
1. BOTH VALVES SHALL BE KEPT CLOSED UNTIL FILLING, FLUSHING, AND BACTERIOLOGICAL TESTING IS COMPLETED AND APPROVED.
2. GAUGE AND RISER TO BE REMOVED AFTER PRESSURE TEST.
3. CITY SHALL BE NOTIFIED BEFORE FILLING AND FLUSHING.
4. AFTER RELEASE FROM THE HEALTH DEPARTMENT, BOTH VALVES TO BE LEFT OPEN WITH 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 PRECEEDING 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
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

FILL & FLUSH DETAIL

PW 1.1

DATE: 01-18-2008



NOTES:

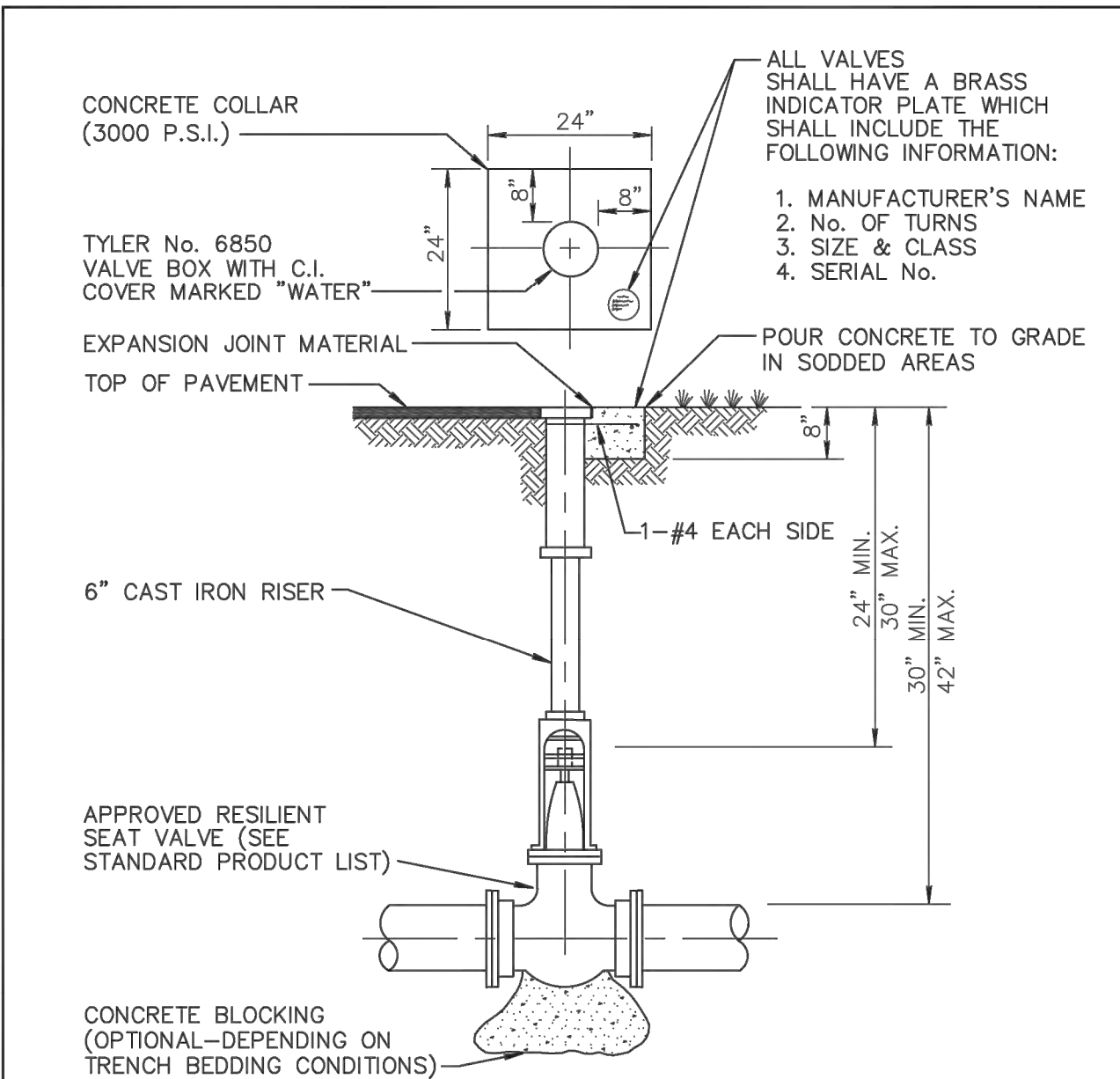
1. STORM AND SANITARY SEWERS CROSSING UNDER WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER PIPE JOINTS 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 52 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 WATERMAINS 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 BETER.

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

WATER MAIN & SEWER CONFLICT

PW 2.1

DATE: 02-19-08



NOTES:

1. 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.
2. AT DEAD END OR WHERE MAIN LINES CHANGE DIRECTION, VALVES SHALL BE RESTRAINED USING MECHANICAL JOINT RESTRAINTS, TIERODS, OR OTHER APPROVED RESTRAINT.

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444

TYPICAL GATE VALVE DETAIL
4" THRU 12"

PW 3.1

DATE: 06-27-14

CITY PROJECT NO.

CAULFIELD & WHEELER, INC.

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE - SURVEYING
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (360) 392-1991 / FAX (360) 730-1452

OCEAN DELRAY
WATER DISTRIBUTION &
SANITARY SEWER DETAILS
DELRAY BEACH, FLORIDA

DATE 10/01/18
DRAWN BY MVK
F.B./ PG. ----
SCALE 1"= 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
FOR THE FIRM
DATE

JOB # 8296
SHT. NO.
WS-2
OF 15 SHEETS

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



CAST IRON VALVE BOXES,
TWO PIECE

DATE: 02-28-08
PW 3.2



TYPICAL BUTTERFLY VALVE SETTING

DATE: 09-11-00

PW 4.1



1. HYDRANT SHALL BE INSTALLED PLUMB AND TRUE IN UNOBSTRUCTED LOCATION. (7.5' CLEARANCE ON THREE SIDES, 4' CLEARANCE AT REAR, WITH 3' ACCESS LANE)
2. NO BARREL EXTENSION SHALL BE PERMITTED WITHOUT PRIOR CONSENT OF CITY ENGINEER.
3. VALVE SHALL BE PLACED ADJACENT TO MAIN, TIED TO TEE.
4. ANCHOR TEES AND FITTINGS ARE PERMITTED.
5. HYDRANT SHALL BE MUELLER CENTURIUM, AMERICAN B-84B, CLOW MEDALLION OR KENNEDY K81A WITH TRAFFIC BREAKAWAY FLANGE AND 5-1/4" VALVE.
6. HYDRANTS SHALL NOT ENCRATCH ON SIDEWALKS, ROADWAYS, OR BIKE PATHS.
7. ON RUNS LONGER THAN 20 FEET A SECOND VALVE IS REQUIRED AT THE HYDRANT.
8. ALL HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH CITY OF DELRAY BEACH FIRE PREVENTION CODE SEC. 98.05.
9. IN CERTAIN SITUATIONS, PROTECTIVE BOLLARDS MAY BE REQUIRED AS DIRECTED BY THE ENGINEERING DEPT. (SEE BOLLARD DETAIL PW 5.2)
10. 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.
11. ALL HYDRANT LEADS GREATER THAN 20- FEET MUST HAVE AUTOMATIC FLUSHER INSTALLED AT HYDRANT END (HYDROGUARD HG-1 STANDARD).



TYPICAL FIRE HYDRANT INSTALLATION

DATE: 06-27-2014
PW 5.1



BOLLARD DETAIL

DATE: 09-11-00
PW 5.2



1. GALVANIZED PIPING AND FITTINGS SHALL NOT BE USED.
2. JOINT RESTRIANTS TO BE INSTALLED MIN. TWO JOINTS BEFORE DEAD END.
3. HYDRO-GUARD IS TO BE USED AT ALL PERMANENT DEAD ENDS. (SEE 6.2b)



TYPICAL 2" TERMINAL BLOW-OUT
FOR TEMPORARY DEAD ENDS

DATE: 01-18-200

PW 6.1c



NOTES:

1. GALVANIZED PIPING AND FITTINGS SHALL NOT BE USED.
2. JOINT RESTRIANTS TO BE INSTALLED MIN. TWO JOINTS BEFORE DEAD END.
3. HYDRO-GUARD IS TO BE USED AT ALL PERMANENT DEAD ENDS.



TYPICAL 2" TERMINAL BLOW-OFF
FOR PERMANENT DEAD ENDS

PW 6.1b



1. SAMPLE POINT SHOULD BE AT SERVICE LINE OR FIRE HYDRANT IF POSSIBLE.
2. IF SAMPLE POINT IS NOT AT SERVICE LINE OR FIRE HYDRANT, CORP. STOP SHALL BE SHUT OFF AT MAIN AND ALL TUBING SHALL BE REMOVED, AND CORP. STOP SHALL HAVE A BRASS PLUG OR CAP INSTALLED AFTER RELEASE OF WATER MAIN BY PALM BEACH COUNTY HEALTH DEPARTMENT.
3. IF AT ALL POSSIBLE SAMPLE POINT SHALL NOT BE LOCATED IN A TRAFFIC AREA.
4. SAMPLE POINTS SHALL KEEP RUNNING UNTIL HEALTH DEPT. RELEASE AND ALL MAIN LINE VALVES ARE OPENED.



TYPICAL SAMPLE POINT

DATE: 01-13-2006

PW 7.1



1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" ON CENTER.
2. SERVICE LINES SHALL NOT BE PLACED UNDER DRIVEWAYS.
3. ALL METERS REQUIRE A LOCKING BRASS CURB STOP WITH LOCK WING (1" MIN.).
4. NO FITTINGS BETWEEN CORPORATION STOP AND BRANCH ASSEMBLY.
5. MAXIMUM SERVICE LENGTH IS 100' TO METER.
6. CASING PIPE I.D. SHALL BE SERVICE O.D. PLUS 1" MINIMUM.
7. MINIMUM BEND RADIUS ON SERVICES SHALL BE 14" ON ALL SERVICES BEHIND METER.
8. METER SIZE WILL BE DETERMINED BY PUBLIC UTILITIES DEPT. UPON APPLICATION FOR SERVICE.
9. ALL VALVES TO BE BALL VALVES.
10. METER BOX SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
11. ALL STANDARD NOTES REGARDING PRESSURE TEST LIMIT AND PAVEMENT APPLY. SEE DETAIL PW 9.1g FOR FURTHER INFORMATION.
12. ABOVE CONFIGURATION APPLIES TO PLACEMENT AT SINGLE FAMILY RESIDENCES. FOR DOUBLE SERVICES PLACED AT MULTI-FAMILY RESIDENCES THE TWO SERVICES SHALL BE PLACED WITHIN A DOUBLE METER BOX.
13. 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.



TYPICAL DOUBLE SERVICE CONNECTION

DATE: 11-19-2015

CITY PROJECT NO.



CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE - SURVEYING
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-1452

**OCEAN DELRAY
WATER DISTRIBUTION &
SANITARY SEWER DETAILS**
DELRAY BEACH, FLORIDA

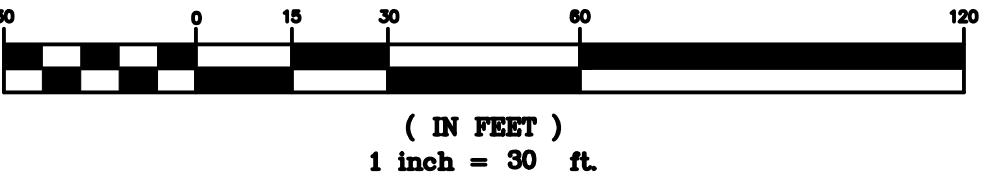
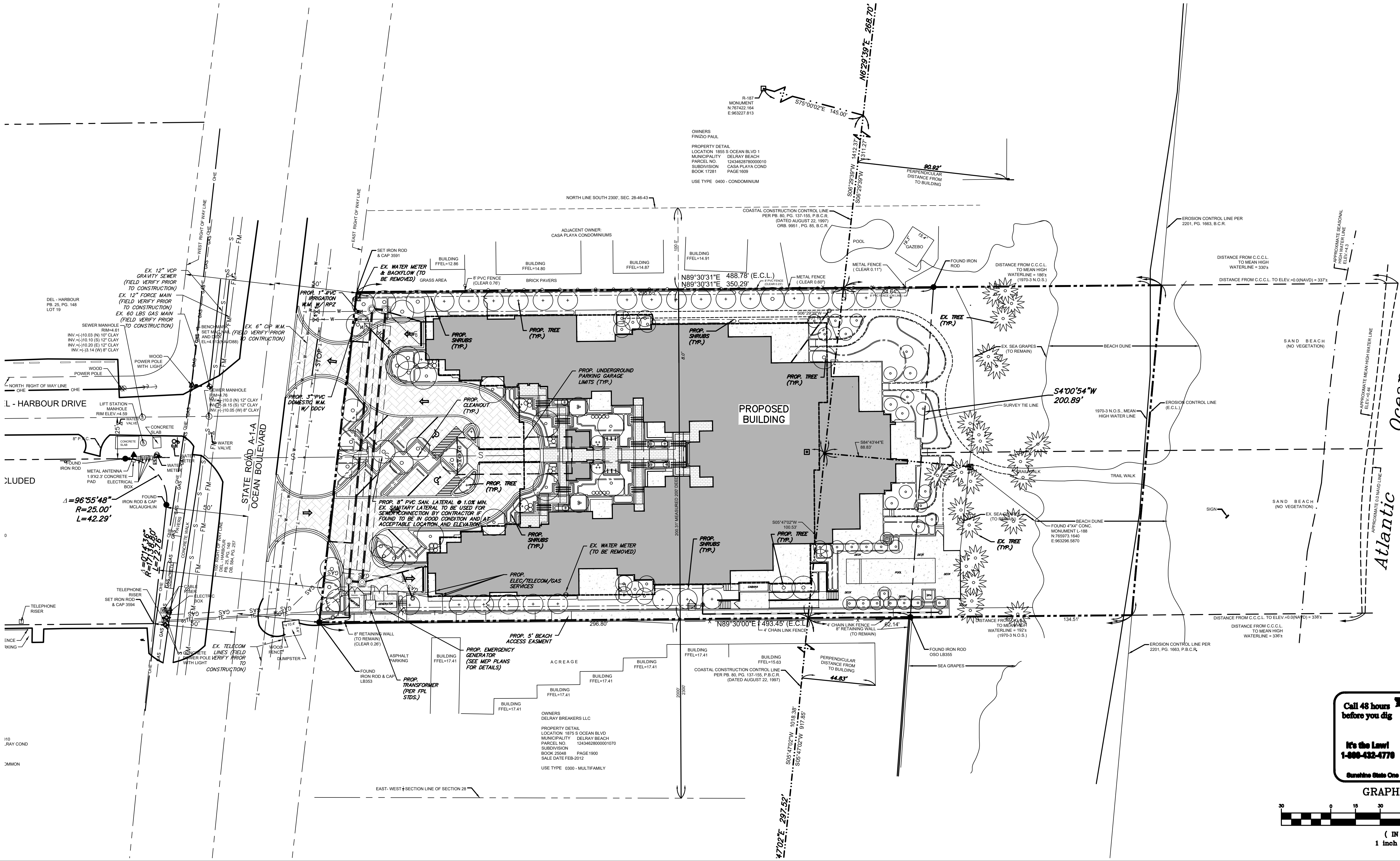
MATTHEW V. KAHN PROFESSIONAL ENGINEER LICENSE NO. 82227 STATE OF FLORIDA - FOR THE FIRM - DATE

JOB # 8296

SHT. NO.
WS-3
OF 15 SHEETS

LEGEND

- PROPERTY/ROW LINE
PROPOSED PIPE AND CATCH BASIN
EXISTING GRADE
PROPOSED WATER LINE
EXISTING WATER LINE
PROPOSED SANITARY SEWER LINE
EXISTING SANITARY SEWER LINE
PROPOSED ELECTRIC LINE
EXISTING OVERHEAD LINE
PROPOSED TELEPHONE/CABLE LINE
EXISTING TELEPHONE/CABLE LINE
PROPOSED GAS LINE
EXISTING GAS LINE
- PROPOSED CONCRETE (4")
PROPOSED PAVER DRIVEWAY
PROPOSED PAVER WALKWAY
PROPOSED BUILDING
PROPOSED FILL EAST OF THE CCCL
PROPOSED CUT EAST OF THE CCCL



REVISED PER CITY & DEP SUBMISSION	DATE	BY
02/05/19		MVK
01/10/19		MVK
11/16/18		MVK
REVISIONS	DATE	BY
REVISED PER ARCH CHANGES		
FILE NAME: 8296_RNC.dwg		

CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING - LAND SURVEYING
LANDSCAPE ARCHITECTURE
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561) 392-1991 / FAX (561) 750-1452

OCEAN DELRAY
PROPOSED COMPOSITE
UTILITY PLAN
DELRAY BEACH, FLORIDA

DATE	10/01/18
DRAWN BY	MVK
F.B./ PG.	----
SCALE	1" = 30'

MATTHEW V. KAHN
PROFESSIONAL ENGINEER
LICENSE NO. 82227
STATE OF FLORIDA
- FOR THE FIRM -
DATE

JOB #	8296
SHT. NO.	WS-5
OF 15 SHEETS	