

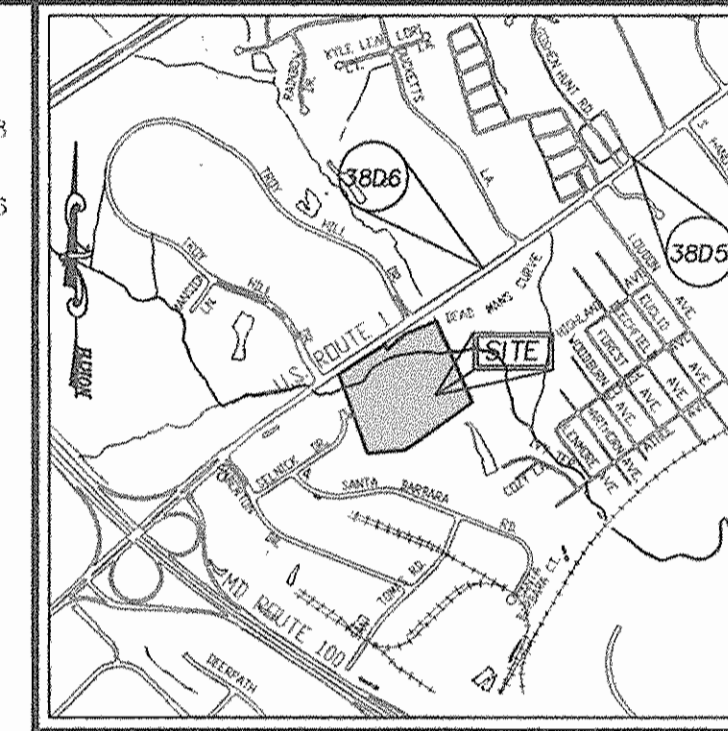
FINAL WATER PLAN

BELMONT STATION PARCELS A, B, C AND OPEN SPACE LOT 1

CONT. 44-4385-D

BENCHMARKS

HOWARD COUNTY BENCHMARK 38D6
N 557155.459 E 1384992.262 ELEV. 175.278
HOWARD COUNTY BENCHMARK 38D5
N 558378.575 E 1386524.158 ELEV. 193.726



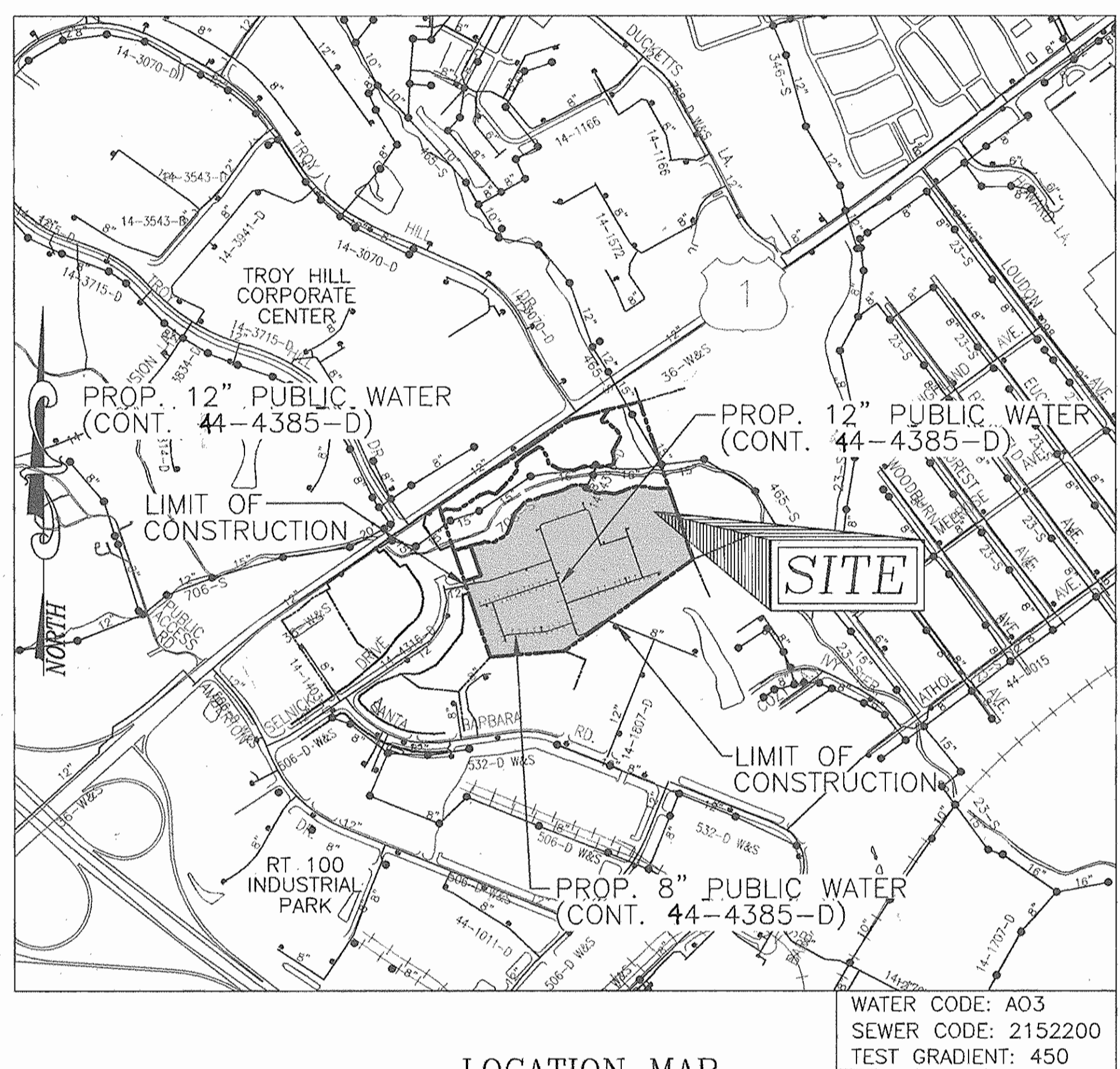
VICINITY MAP

SCALE: 1"=2000'
ADC Map Coordinate: 17 D10

GENERAL NOTES

- PART I**
- APPROXIMATE LOCATION OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
 - THE TOPOGRAPHY SHOWN HEREON IS BASED ON AN AERIAL SURVEY BY VRM DATED FEBRUARY 2004; SUPPLEMENTED WITH FIELD RUN TOPO DATED OCTOBER 14, 2006.
 - HORIZONTAL AND VERTICAL SURVEY CONTROLS:**
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM AND "83" DATUM AS PRODUCED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 38D5, AND NO. 38D6.
ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON DRAWINGS ARE:
GEODETIC SURVEY CONTROL 38D5 (ELEV. 193.726 FT.)
BRASS DISK SET ON TOP OF A CONCRETE MONUMENT, 5.6' NORTH OF CONCRETE CURB ON ROUTE 1, WEST OF AMBERMAN AVENUE.
GEODETIC SURVEY CONTROL 38D6 (ELEV. 175.278 FT.)
BRASS DISK SET ON TOP OF A CONCRETE MONUMENT, 44' SOUTH OF LIGHTPOLE AND 5.5' WEST OF ADJACENT ATLANTIC SUPPLY CO., EAST OF ROUTE 1.
 - ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED. CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
 - FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS USE, HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
 - WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL AT THE LOCATION OF THE TEST PIT. A NOTES OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATION AT HIS OWN EXPENSE.
 - THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN THESE PLANS:
AT&T 1-800-252-1133
BOE (CONTRACTOR SERVICE) 410-850-4620
BOE (EMERGENCY) 410-685-1400
BUREAU OF UTILITIES 410-313-4800
CLONIA PIPELINE CO. 410-705-1380
MISS. UTILITY 1-800-257-7777
STATE HIGHWAY ADMINISTRATION 410-531-5533
VERIZON 1-800-743-0033/410-224-9210
 - TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
 - THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE CONSTRUCTION OF THE MAIN.
 - THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE ANY OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(g) OF THE HOWARD COUNTY CODE.

LOT	FROM	TO	FEET	TO	FEET
1	W/C	SM-22 4130 RT	15	SHC-29 3400 RT	80
2/5	TW/C	"	28	"	45
4	W/C	"	47	"	26
5	W/C	"	80	"	14
6	W/C	"	99	"	31
7/8	TW/C	INLET 5 2120 RT	30	INLET 3 1175 RT	107
9	W/C	"	57	"	81
10/11	TW/C	"	90	"	46
12	W/C	"	127	"	10
13	W/C	"	147	"	17
14	W/C	SM-24 015 RT	125	"	39
15/16	TW/C	"	87	"	74
17/18	TW/C	"	47	"	117
19/20	TW/C	SM-19 2122 LT	20	SM-16 1180 LT	31
21	W/C	"	78	"	39
22/23	TW/C	"	49	"	111
24	W/C	SD-25 0120 LT	46	INLET 1 0120 LT	72
25/26	TW/C	"	38	"	49
27/28	TW/C	"	69	"	49
29/30	TW/C	INLET 5 3120 RT	40	"	191
31	W/C	"	42	"	125
32	TW/C	"	92	"	112
33/34	W/C	"	76	"	78
35	W/C	"	103	"	59
36	W/C	"	123	"	40
37	W/C	SM-24 015 RT	155	"	35
38/39	TW/C	"	125	"	54
40/41	TW/C	"	82	"	192
42/43	TW/C	SM-20 3145 LT	19	SM-17 2130 LT	125
44	TW/C	"	49	"	89
45/46	W/C	"	35	"	48
47	W/C	"	71	"	26
48/49	TW/C	"	94	"	198
50/51	TW/C	FH-18 2106 LT	40	SM-16 0110 LT	118
52/53	TW/C	"	79	"	42
54/55	TW/C	"	118	"	78
56/57	TW/C	"	158	"	133
58/59	TW/C	SM-16 0110 LT	57	FH-18 2106 LT	150
60	W/C	"	74	"	133
61/62	TW/C	"	112	"	94
63/64	TW/C	"	150	"	58
65	W/C	"	184	"	39
66/67	TW/C	SM-17 2130 LT	21	SM-20 3145 LT	120
68	W/C	"	35	"	92
69/70	W/C	"	69	"	62
71/72	TW/C	"	112	"	28
73	W/C	SM-21 1218 RT	31	"	76
74/75	TW/C	"	39	"	58
76/77	TW/C	"	75	"	55
78/79	TW/C	"	107	"	78
80	TW/C	SM-11 1125 LT	23	INLET 12 2140	130
81/82	TW/C	"	33	"	112
83/84	TW/C	"	64	"	77
85	W/C	"	97	"	47
86/87	TW/C	INLET 12 2140 RT	32	SM-13 4120 LT	158
88	W/C	"	47	"	91
89/90	TW/C	"	78	"	98
91	W/C	"	96	"	77
92	W/C	"	130	"	45
93	W/C	"	143	"	26
94/95	TW/C	"	110	"	27
96	W/C	"	81	"	86
97	W/C	"	57	"	119
98/99	TW/C	"	30	SM-11 1125 LT	103
100/101	TW/C	"	70	"	64
102/103	TW/C	"	106	"	28
104/105	W/C	"	141	"	15
106	W/C	"	46	INLET 2 2160 LT	77
107/108	TW/C	SM-20 10165 RT	80	"	44
109/110	TW/C	"	25	SM-15 4185	78
111	W/C	"	37	"	50
112	W/C	"	48	"	32
113	W/C	"	58	"	25
114	W/C	"	58	"	25



LOCATION MAP
SCALE: 1"=600'

WATER CODE: A03
SEWER CODE: 2152200
TEST GRADIENT: 450

TYPE OF BUILDING :	TOWNHOUSES & APARTMENTS
NO. OF LOTS/PARCELS :	3
NO. OF SINGLE WATER HOUSE CONNECTIONS :	39
NO. OF TWIN WATER HOUSE CONNECTIONS :	41
NO. OF SEWER HOUSE CONNECTIONS :	123
DRAINAGE AREA :	PATAPSCO
TREATMENT PLANT :	PATAPSCO RIVER

QUANTITIES				
NAME OF UTILITY CONTRACTOR : SEH EXCAVATING CONTRACTOR				
SURVEY AND DRAFTING DIVISION AS-BUILT DATE :				
ITEMS	QUANTITIES ESTIMATED	AS-BUILT		
		QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
WATER				
12" WATER	1139 LF	1139	C-900	NORTH AMERICA FERUGSON
8" WATER	2716 LF	2,716	C-900	"
6" WATER	238 LF	238	C-900	"
4" W/C	10 LF	0	"	"
1-1/2" W/C	1500 LF	1,500	K-COPPER	MUELLER / FERUGSON
12" x 12" TEE	1 EA	1	D.I.P.	SIGMA / FERUGSON
12" x 8" TEE	3 EA	3	"	"
12" x 6" TEE	5 EA	5	"	"
8" x 8" TEE	4 EA	4	"	"
8" x 6" TEE	11 EA	11	"	"
12" x 8" REDUCER	2 EA	2	GATE V.	MUELLER / FERUGSON
12" VALVE	10 EA	10	"	"
8" VALVE	21 EA	21	"	"
6" VALVE	15 EA	15	"	"
6" FIRE HYDRANT	11 EA	11	"	"
12" - 5' PVC SWEEP	2 EA	0	"	"
12" - 1/8" BEND	3 EA	3	D.I.P.	SIGMA / FERUGSON
12" - 1/32 BEND	3 EA	3	"	"
12" COUPLING	5 EA	5	"	"
8" - 1/8" BEND	6 EA	6	"	"
8" - 1/32 BEND	2 EA	2	"	"
8" COUPLING	17 EA	17	"	"
8" CAP & BUTTRESS	3 EA	3	"	"
6" CAP & BUTTRESS	6 EA	6	"	"
4" CAP & BUTTRESS	1 EA	1	"	"
1" SINGLE OUTSIDE METER	32 EA	32	1" SETTING	A.Y. Mc DONALD / FERUGSON
1" TWIN OUTSIDE METER	41 EA	41	"	"
8" x 4" TEE	1 EA	0	"	"
4" VALVE	1 EA	0	"	"

PART III - SEWER

- ALL SEWER MAINS SHALL BE D.I.P. OR P.V.C UNLESS OTHERWISE NOTED.
 - ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
 - FORCE MAINS SHALL BE D.I.P. ONLY.
 - MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
 - MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL 05.52. WHERE WATERTIGHT MANHOLE FRAME AND COVERS ARE USED, SET TOP OF FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
 - HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT CELLAR CANNOT BE SERVED.
- SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN SDP-06-034.

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

John C. Robertson 11/29/06
SOIL CONSERVATION DISTRICT DATE

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

Jim Mays 11/29/06
SOIL CONSERVATION DISTRICT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert H. Vogel 11-29-06
CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

Chris Cameron 11/30/06
CHIEF DEVELOPMENT ENGINEERING DIVISION DATE

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET TEL: 410.461.7666
ELLCOTT CITY, MD 21043 FAX: 410.461.8961

STATE OF MARYLAND
WALTER GEORGE ZIMMERMAN
No. 3103
11/27/04
WALTER G. ZIMMERMAN, P.E. No. 32033

DES:	DZ			
DRN:	DZ			
CHK:	WGZ	K.C.I 2	A9- BUILT DATA SHOWN	12/4/07
DATE:	NOV. 28, 2006	RHW 1	REVISE W/C TO UNIT 97 TO MATCH FOR UNITS 96 AND 97; REVISE W/C AND S/C TO MAINTENANCE BUILDING	4-20-07
BY:	NO.		REVISION	DATE

FINAL WATER PLAN
COVER SHEET

600' SCALE MAP NO. 37
BLOCK NO. 18

OWNER/DEVELOPER
ELKRIDGE DEVELOPMENT, LLC
301 TRANSYLVANIA AVENUE
RALEIGH, NC 27609
(919) 789-9289

ELKRIDGE DEVELOPMENT NO.2, LLC
301 TRANSYLVANIA AVENUE
RALEIGH, NC 27609
(919) 789-9289

BELMONT STATION
PARCELS A, B, C AND OPEN SPACE LOT 1
REF: S-04-10, P-05-17, WP-04-102, WP-06-703 PLATS 18648-21

CONTRACT NO. 44-4385-D

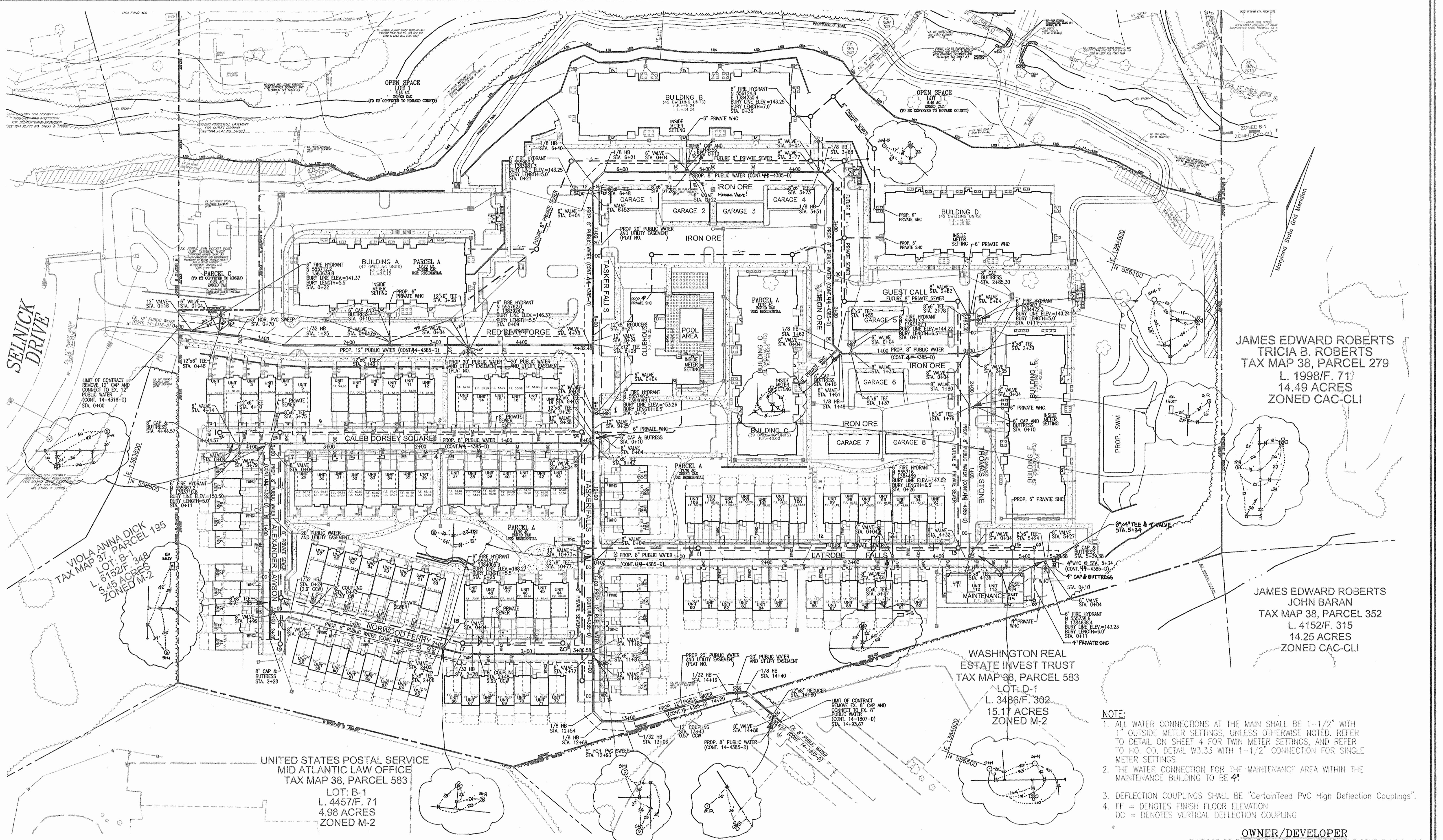
TAX MAP 37, BLOCK 18
1ST ELECTION DISTRICT

PARCELS 196, 198, 199
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 1 OF 4

SDP-06-034, 04-08, 09-09, 10-09, 11-09, 12-09, 13-09, 14-09, 15-09, 16-09, 17-09, 18-09, 19-09, 20-09, 21-09, 22-09, 23-09, 24-09, 25-09, 26-09, 27-09, 28-09, 29-09, 30-09, 31-09, 32-09, 33-09, 34-09, 35-09, 36-09, 37-09, 38-09, 39-09, 40-09, 41-09, 42-09, 43-09, 44-09, 45-09, 46-09, 47-09, 48-09, 49-09, 50-09, 51-09, 52-09, 53-09, 54-09, 55-09, 56-09, 57-09, 58-09, 59-09, 60-09, 61-09, 62-09, 63-09, 64-09, 65-09, 66-09, 67-09, 68-09, 69-09, 70-09, 71-09, 72-09, 73-09, 74-09, 75-09, 76-09, 77-09, 78-09, 79-09, 80-09, 81-09, 82-09, 83-09, 84-09, 85-09, 86-09, 87-09, 88-09, 89-09, 90-09, 91-09, 92-09, 93-09, 94-09, 95-09, 96-09, 97-09, 98-09, 99-09, 100-09, 101-09, 102-09, 103-09, 104-09, 105-09, 106-09, 107-09, 108-09, 109-09, 110-09, 111-09, 112-09, 113-09, 114-09, 115-09, 116-09, 117-09, 118-09, 119-09, 120-09, 121-09, 122-09, 123-09, 124-09, 125-09, 126-09, 127-09, 128-09, 129-09, 130-09, 131-09, 132-09, 133-09, 134-09, 135-09, 136-09, 137-09, 138-09, 139-09, 140-09, 141-09, 142-09, 143-09, 144-09, 145-09, 146-09, 147-09, 148-09, 149-09, 150-09, 151-09, 152-09, 153-09, 154-09, 155-09, 156-09, 157-09, 158-09, 159-09, 160-09, 161-09, 162-09, 163-09, 164-09, 165-09, 166-09, 167-09, 168-09, 169-09, 170-09, 171-09, 172-09, 173-09, 174-09, 175-09, 176-09, 177-09, 178-09, 179-09, 180-09, 181-09, 182-09, 183-09, 184-09, 185-09, 186-09, 187-09, 188-09, 189-09, 190-09, 191-09, 192-09, 193-09, 194-09, 195-09, 196-09, 197-09, 198-09, 199-09, 200-09, 201-09, 202-09, 203-09, 204-09, 205-09, 206-09, 207-09, 208-09, 209-09, 210-09, 211-09, 212-09, 213-09, 214-09, 215-09, 216-09, 217-09, 218-09, 219-09, 220-09, 221-09, 222-09, 223-09, 224-09, 225-09, 226-09, 227-09, 228-09, 229-09, 230-09, 231-09, 232-09, 233-09, 234-09, 235-09, 236-09, 237-09, 238-09, 239-09, 240-09, 241-09, 242-09, 243-09, 244-09, 245-09, 246-09, 247-09, 248-09, 249-09, 250-09, 251-09, 252-09, 253-09, 254-09, 255-09, 256-09, 257-09, 258-09, 259-09, 260-09, 261-09, 262-09, 263-09, 264-09, 265-09, 266-09, 267-09, 268-09, 269-09, 270-09, 271-09, 272-09, 273-09, 274-09, 275-09, 276-09, 277-09, 278-09, 279-09, 280-09, 281-09, 282-09, 283-09, 284-09, 285-09, 286-09, 287-09, 288-09, 289-09, 290-09, 291-09, 292-09, 293-09, 294-09, 295-09, 296-09, 297-09, 298-09, 299-09, 300-09, 301-09, 302-09, 303-09, 304-09, 305-09, 306-09, 307-09, 308-09, 309-09, 310-09, 311-09, 312-09, 313-09, 314-09, 315-09, 316-09, 317-09, 318-09, 319-09, 320-09, 321-09, 322-09, 323-09, 324-09, 325-09, 326-09, 327-09, 328-09, 329-09, 330-09, 331-09, 332-09, 333-09, 334-09, 335-09, 336-09, 337-09, 338-09, 339-09, 340-09, 341-09, 342-09, 343-09, 344-09, 345-09, 346-09, 347-09, 348-09, 349-09, 350-09, 351-09, 352-09, 353-09, 354-09, 355-09, 356-09, 357-09, 358-09, 359-09, 360-09, 361-09, 362-09, 363-09, 364-09, 365-09, 366-09, 367-09, 368-09, 369-09, 370-09, 371-09, 372-09, 373-09, 374-09, 375-09, 376-09, 377-09, 378-09, 379-09, 380-09, 381-09, 382-09, 383-09, 384-09, 385-09, 386-09, 387-09, 388-09, 389-09, 390-09, 391-09, 392-09, 393-09, 394-09, 395-09, 396-09, 397-09, 398-09, 399-09, 400-09, 4



JAMES EDWARD ROBERTS
TRICIA B. ROBERTS
TAX MAP 38, PARCEL 279
L. 1998/F. 71
14.49 ACRES
ZONED CAC-CLI

JAMES EDWARD ROBERTS
JOHN BARAN
TAX MAP 38, PARCEL 352
L. 4152/F. 315
14.25 ACRES
ZONED CAC-CLI

WASHINGTON REAL
ESTATE INVEST TRUST
TAX MAP 38, PARCEL 583
LOT: D-1
L. 3486/F. 302
15.17 ACRES
ZONED M-2

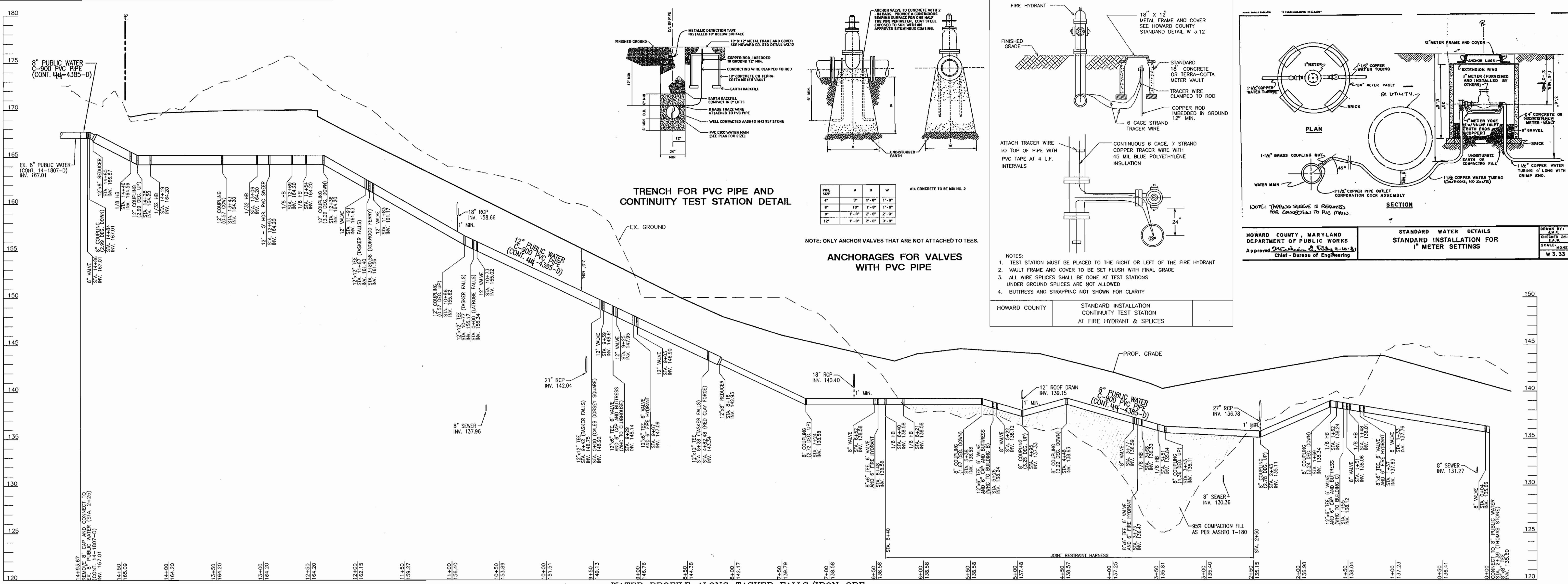
UNITED STATES POSTAL SERVICE
MID ATLANTIC LAW OFFICE
TAX MAP 38, PARCEL 583
LOT: B-1
L. 4457/F. 71
4.98 ACRES
ZONED M-2

- NOTE:**
1. ALL WATER CONNECTIONS AT THE MAIN SHALL BE 1-1/2" WITH 1" OUTSIDE METER SETTINGS, UNLESS OTHERWISE NOTED. REFER TO DETAIL ON SHEET 4 FOR TWIN METER SETTINGS, AND REFER TO HO. CO. DETAIL W3.33 WITH 1-1/2" CONNECTION FOR SINGLE METER SETTINGS.
 2. THE WATER CONNECTION FOR THE MAINTENANCE AREA WITHIN THE MAINTENANCE BUILDING TO BE 4".
 3. DEFLECTION COUPLINGS SHALL BE "CertainTeed PVC High Deflection Couplings".
 4. FF = DENOTES FINISH FLOOR ELEVATION
DC = DENOTES VERTICAL DEFLECTION COUPLING

PLAN VIEW
SCALE: 1"=50'

OWNER/DEVELOPER
ELKRIDGE DEVELOPMENT, LLC
301 TRANSYLVANIA AVENUE
RALEIGH, NC 27609
(919) 789-9259
ELKRIDGE DEVELOPMENT NO.2, LLC
301 TRANSYLVANIA AVENUE
RALEIGH, NC 27609
(919) 789-9259

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert H. Vogel</i> 11-29-06 CHIEF, BUREAU OF UTILITIES	DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND <i>William J. Bennett</i> 11/29/06 CHIEF, DEVELOPMENT ENGINEERING DIVISION	ROBERT H. VOGEL ENGINEERS • SURVEYORS • PLANNERS 8407 MAIN STREET ELLCOTT CITY, MD 21043 TEL: 410.461.7666 FAX: 410.461.8961		<table border="1"> <tr> <td>DES:</td> <td>DZ</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DRN:</td> <td>DZ</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CHK:</td> <td>WGZ</td> <td>K.C.I</td> <td>Z</td> <td>AS-BUILT DATA SHOWN</td> <td>12/09/07</td> </tr> <tr> <td></td> <td></td> <td>R.H.V</td> <td>1</td> <td>REVISE WMC TO UNIT #1 TO A TWINC FOR UNITS 90 AND 91</td> <td>4-20-01</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>REVISE WMC AND SHC TO MAINTENANCE BUILDING</td> <td></td> </tr> <tr> <td>DATE:</td> <td>NOV. 28, 2006</td> <td>BY:</td> <td>NO.</td> <td>REVISION</td> <td>DATE</td> </tr> </table>	DES:	DZ					DRN:	DZ					CHK:	WGZ	K.C.I	Z	AS-BUILT DATA SHOWN	12/09/07			R.H.V	1	REVISE WMC TO UNIT #1 TO A TWINC FOR UNITS 90 AND 91	4-20-01					REVISE WMC AND SHC TO MAINTENANCE BUILDING		DATE:	NOV. 28, 2006	BY:	NO.	REVISION	DATE	<p align="center">FINAL WATER PLAN PLAN VIEW</p> <p>600' SCALE MAP NO. 37 BLOCK NO. 18</p>	<p align="center">BELMONT STATION PARCELS A, B, C AND OPEN SPACE LOT 1 REF: S-04-10, P-05-17, WP-04-102, WP-05-76, PLATS 2002-21 CONTRACT NO. 44-4385-D</p> <p>TAX MAP 37, BLOCK 18 1ST ELECTION DISTRICT PARCELS 196, 198, 199 HOWARD COUNTY, MARYLAND</p>	SCALE AS SHOWN SHEET 2 OF 4
DES:	DZ																																										
DRN:	DZ																																										
CHK:	WGZ	K.C.I	Z	AS-BUILT DATA SHOWN	12/09/07																																						
		R.H.V	1	REVISE WMC TO UNIT #1 TO A TWINC FOR UNITS 90 AND 91	4-20-01																																						
				REVISE WMC AND SHC TO MAINTENANCE BUILDING																																							
DATE:	NOV. 28, 2006	BY:	NO.	REVISION	DATE																																						



AMENDMENT TO THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION

Except as indicated herein, all work shall be in accordance with the pertinent sections of the Howard County Design Manual Volume IV-Standard Specifications and Details for Construction, Article 9, Sections 908 Nonmetallic Pipes and Draining Tiles and Article 10, Section 1002 Water Mains of the Howard County Standard Specifications are amended to include the following requirements.

- GENERAL**
- All polyvinyl chloride (PVC) pipe, fabricated fittings, and couplings shall be manufactured and tested in accordance with AWWA C900. This 3-ply certification (listing by Underwriters Laboratory (UL)) shall also be required for all PVC pipe. All injected molded polyvinyl chloride (PVC) fittings shall be manufactured and tested in accordance with AWWA C907. All products shall be homogeneous throughout and free from visible cracks, bubbles, blisters, holes, foreign inclusions, cuts, or scrapes on inside or outside surfaces, or other imperfections, which may impair the performance or life of the pipeline. Each pipe shall be straight to within 1/4-inch per 20-foot length of pipe when uniformly supported along its entire length, and shall have a true circular cross-section to within ± 1/64 inch.
 - PVC pipe manufactured more than one year prior to work site inspection will not be accepted.
 - Loading, unloading, handling, inspection and storage of PVC pipe and fittings shall be in accordance with AWWA C605. PVC pipe shall be supported during storage so that it does not deform or bend.
 - Submittals: The following items shall be submitted for review and approval prior to installation. Materials not approved will not be accepted.
 - PVC Pipe: Submit manufacturer's literature and certificates of compliance for PVC pipe along with the manufacturer's identification codes for nominal size, dimension ratio, pressure class, production record code and date of manufacture. Submit manufacturer's written transcript of test results, for sustained pressure, pipe dimension, burst pressure, flattening resistance, and extrusion quality test. Frequency of performing the tests and the methods of selecting test specimens shall be in accordance with AWWA C900.
 - PVC Pipe Fittings: Submit manufacturer's literature and certificates of compliance for PVC

- Pipe fittings along with the manufacturer's identification codes for nominal size, pressure class, production record code and date of manufacture. Submit manufacturer's written transcript of results for accelerated-regression test, burst pressure and heat-resistance test in accordance with AWWA C900 or C907.
 - Miscellaneous for PVC water pipe: Submit manufacturer's literature and certificates of compliance, for joint restraint devices, pipe couplings, tracer wire, wire connector splice kits, detection tape, and service saddles.
 - Submit manufacturer's installation instructions for PVC pipe and fittings, joint restraint devices, pipe couplings, wire connector splice kits, service saddles, and manufacturer's instructions for tapping pipe.
- MATERIALS**
- The Engineer will inspect all materials before, during and after installation to ensure compliance with the Contract Documents. When specific tests of materials are called for in the referenced standards and specifications, the Engineer has the option of requiring that any or all of these tests be performed for the specified materials.
- PVC pipe and fittings:
 - PVC pipe 4 inches through 12 inches in diameter shall be manufactured in 20-foot lengths in accordance with AWWA C900. Pipe shall have a dimension ratio (DR) of 18, Pressure Class of 150 psi, and shall utilize elastomer-gasketed, push-on joints. Pipes, gaskets, and gasket lubricant shall be suitable for potable water systems and shall meet NSF 61. All PVC pipe shall be factory marked on the spigot end for depth of insertion into the bell and factory tested in accordance with AWWA C900. PVC pipe shall be manufactured by one of the following:
 - Upson ETI
 - J-M Pipe
 - Diamond Plastics Corp
 - National Pipe and Plastics, Inc.
 - Fittings for use with PVC water mains shall be ductile iron, in accordance with Standard Specifications and shall be fusion bonded epoxy coated in conformance with AWWA C116, or PVC. PVC fittings shall have push-on rubber gasketed joints, be injection-molded meeting AWWA C907, Pressure Class 150 or higher, or fabricated meeting AWWA C900, Pressure Class 200. PVC fittings shall be manufactured by the Harrington Corporation (Haro) or approved equal. Pipe joints shall be in accordance

- with the standards specified for the pipe and fittings.
- Pipe couplings for PVC and ductile iron water mains shall be suitable for accelerated-regression test, burst pressure and heat-resistance test in accordance with AWWA C900 or C907.
- Joint restraining materials for PVC pipe:
 - Horizontal and vertical bends, tees, caps and fittings shall be buttressed or anchored in accordance with the Plans, the Standard Specifications and Details for Construction, or as directed by the Engineer. Valves, when connected to PVC pipe, shall be iron body resilient seat gate valves and anchored in accordance with the detail shown on the Plans and shall have one full length of pipe on each side of the valve.
 - Joint restraints for hammering joints shall be in accordance with the Standard Specifications and the requirements below:
 - All joint restraint devices shall be coated to provide corrosion resistance. All coatings shall be impact and UV resistant.
 - In restrained joints, PVC pipe shall not be deflected. If deflection is required in a restrained joint, a wide-angle sweep or fitting shall be used with approved restraints, or use ductile iron pipe fittings with restraints.
 - Where a restrained joint is required between PVC pipe and a fitting, the fitting shall be ductile iron mechanical joint. Joint restraint devices shall be Factory Mutual (FM) or Underwriter Laboratories (UL) approved and shall meet ASTM F1674. Joint restraint shall be UniFlange Series 1500, EBAA Iron series 2000PV, or approved equal.
 - Where a restrained joint is required for PVC push-on joint, the joint restraint device shall meet ASTM F1674 and shall be EBBA Iron Series 1600, UniFlange Series 1390-C, or approved equal.
- Tracer Wire for Non Metallic Pipelines:
 - Tracer wire shall be insulated 8-gauge, 7-strand continuous copper wire with a 45-mil polyethylene insulation. The wire shall be blue, have "UL" markings and suitable for direct bury applications.
 - Continuity Test Station: Continuity test stations shall be located adjacent to each fire hydrant within the public easement for locating PVC water mains. The test station shall be housed in a standard Howard County 18-inch diameter meter vault with an 18"x12" metal

- EXECUTION**
- All construction methods and details shall be in accordance with the Howard County Design Manual Volume IV-Standard Specifications and Details for Construction and the following Criteria:
- Installation of PVC Water Mains:
 - PVC pipe and fittings shall be handled in accordance with AWWA C605.
 - Bedding:
 - Provide 6 inches of stone bedding under the pipe in accordance with Standard Detail C2.01 and the detail shown on the Plans for Trench for PVC Pipe using AASHTO M 43, size number 57 aggregate. The stone bedding shall be installed to grade prior to laying pipe. Excavate bell holes in bedding at each joint to assemble the joint and to insure that the entire length of each pipe barrel, fitting and valve is supported on firm bedding.
 - Whenever a pipe requires cutting, the work shall be done in a manner that leaves a smooth, square end. Cut PVC pipe ends shall have burrs removed and the end beveled to match factory level. To ensure the proper length of insertion of the spigot into the bell, PVC pipe cut in the field shall be beveled and marked on the spigot end to the dimensions specified by the manufacturer prior to assembly.
 - Tracer Wires:
 - Tracer wires with the pipe. Tape wire to the top of the pipe with minimum 2-inch wide x 1/2-inch circumference long PVC tape every 4 feet along the pipe. The copper wire shall be continuous for the full length of the pipeline including all fire hydrant leads and shall terminate at continuity test stations. Continuity test stations shall be located adjacent to all fire hydrants. Where required, splicing shall be done with direct-bury wire connector, wire nut, or splice kit listed and labeled for direct bury, installed as recommended by manufacturer, and taped to the pipe.

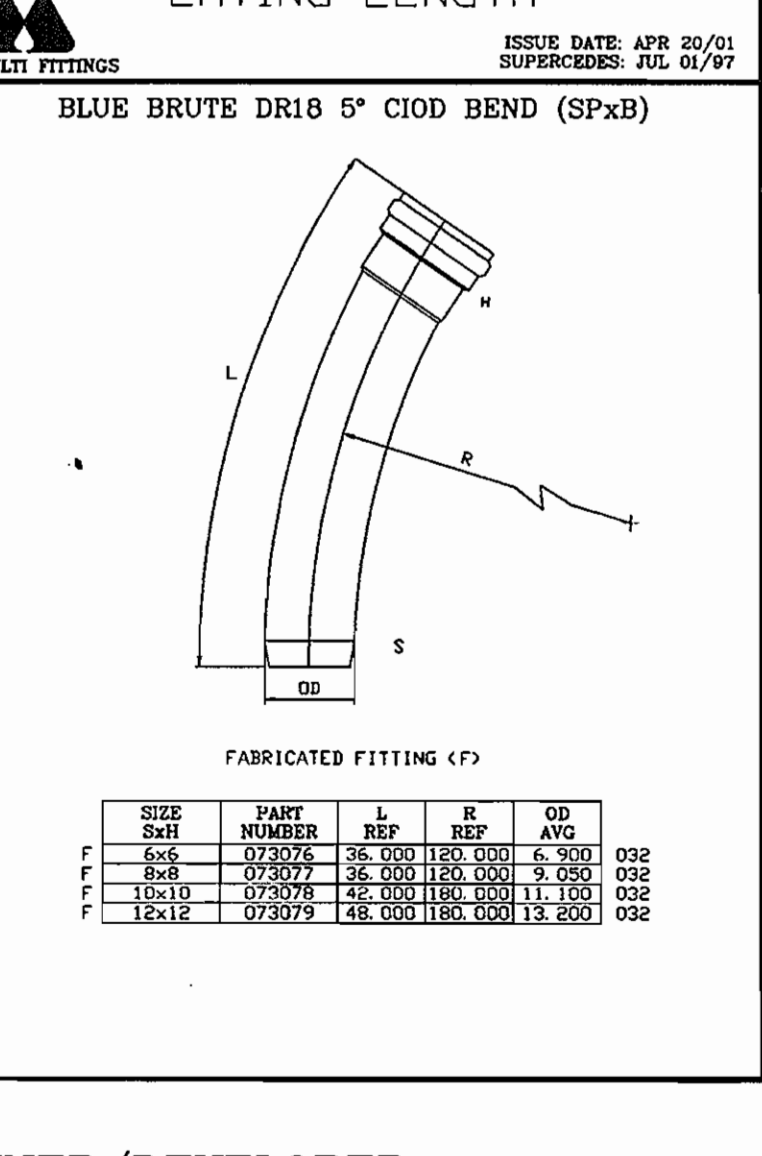
- Connections to PVC waterlines:
 - Connections to PVC waterlines shall be by using fittings, such as tees, indicated on the Plans.
 - Saddles may be used for 2-inch and smaller connections to PVC waterlines. Saddles with clamps shall provide full support around the circumference of the pipe and shall not distort, scratch, or damage the pipe when tightened. Only tapping saddles manufactured specifically for AWWA C900 PVC pipe shall be used. Saddles with clamps shall be formed to meet the curvature of the pipe. Saddles with clamps shall be manufactured for underground service, shall be tested for a minimum service of 150 psi and shall be brass or bronze alloy meeting ASTM B62 or B584 and AWWA C800 or ductile iron saddles meeting ASTM A536 or A395 with two 18-8 stainless steel straps and shall be epoxy or nylon coated. Saddles shall have watertight gaskets of Buna-N rubber meeting ASTM D2000 or nitrile around the tap hole. Saddles shall be one of the following:
 - Ford FC-202
 - Mueller Series DR2S
 - Romex 202N
 - Smith Blair 317 Nylon Coated
 - JCM 406
- Connections to continuity test stations shall be in accordance with the detail shown on the Plans.
- After backfilling, the Contractor shall test the tracer wire in the presence of the County to demonstrate electrical continuity between test stations through the length of the PVC pipeline installed. The Contractor shall notify the County 48 hours in advance of the tests. Any discontinuity shall be located, repaired and retested at the Contractor's expense until continuity is achieved.
- Backfill:
 - Backfill over the PVC pipe in accordance with Standard Detail C2.01 and the detail shown on the Plans for Trench for PVC Pipe using well-compacted AASHTO M 43, size number 57 aggregate to a minimum of 6 inches over the crown of the pipe. Trench backfill shall proceed thereafter in 6-inch layers. Contractor shall provide full trench compaction density of 95% as determined by AASHTO T-80-A.
- Detection Tape:
 - Install detection tape directly over the centerline of the water mains on compacted backfill not less than 18 inches or more than 24 inches below finished surface. Tape shall be installed with minimal splices. Splices shall overlap a minimum of 6 inches.
- Joints:
 - Mechanical Joints: For PVC plain-end to be connected to ductile iron mechanical joint bell, assemble the joint in accordance with the Standard Specifications, as modified in AWWA C605, the pipe manufacturer's recommendations and as specified herein. For PVC pipe plain end to be inserted into mechanical joint bells, cut the bell to the plain-end fit square cut. Do not deflect PVC pipe at connection to cast or ductile iron pipe or fittings.
 - Push-on Joints: For PVC pipe plain ends to be inserted in ductile iron or cast iron push-on bell, the spigot taper shall be cut to 1/4-inch length. Place an identifying mark on pipe that is not finished with a depth mark on the plain end to show the depth of the socket and to verify that pipe is properly set in the bell. Assemble joints in accordance with AWWA C600 and C605, the manufacturer's recommendations, and as specified herein.

- Do not deflect PVC pipe at connection to cast or ductile iron pipe or fittings. The Contractor shall achieve change in alignment as indicated elsewhere herein. Assembly of the plain end into the bell shall be done in accordance with manufacturer's recommendations. Install push-on restrained joints in accordance with manufacturer's recommendations.
- Restrained Joints: In a restrained joint, PVC pipe shall not be deflected. If deflection is required in a restrained joint, a fitting with approved restraints or use restrained ductile iron pipe.
- Where the Contractor chooses to use PVC fittings, the pressure class of the fitting shall be the same as, or greater than, the pressure class of the pipe to which it connects. If the pressure class is not available, the Contractor shall use a ductile iron fitting. Where a fitting with restrained joints is required, a ductile iron mechanical joint shall be used.
- Fire Hydrant lead, including mainline tee, shall be ductile iron only.
- Connections to PVC pipe for Water House Connections:
 - Perform taps on PVC pipe in accordance with AWWA C605, the pipe manufacturer's recommendations, and as indicated herein.
 - Install a service saddle when tapping a PVC water main. Maintain a minimum distance of 24 inches from PVC pipe bells.
 - For PVC water pipe, use only cutting/tapping tools and machines made specifically for cutting AWWA C900 pipe and as described in AWWA C605. The cutting/tapping machine shall be installed so that it does not distort the pipe. The machine shall be supported so that its weight is not carried by the pipe. When tapping PVC pipe, follow the manufacturer's safety precautions and the safety precautions cited in AWWA C605.
 - Multiple taps in a single pipe shall be staggered around the pipe circumference so they are not on a common line parallel to the longitudinal axis of the pipe and be at least 18-inches apart when measured longitudinally.

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CHIEF, BUREAU OF UTILITIES 11-29-04

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

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STATE OF MARYLAND
WALTER G. ZAWISKA, PE No. 32033

DES:	DZ				
DRN:	DZ				
CHK:	WGZ				
DATE:	NOV. 28, 2006				
BY	NO.	REVISION	DATE	600' SCALE MAP NO.	37

FINAL WATER PLAN PROFILES

BLOCK NO. 18

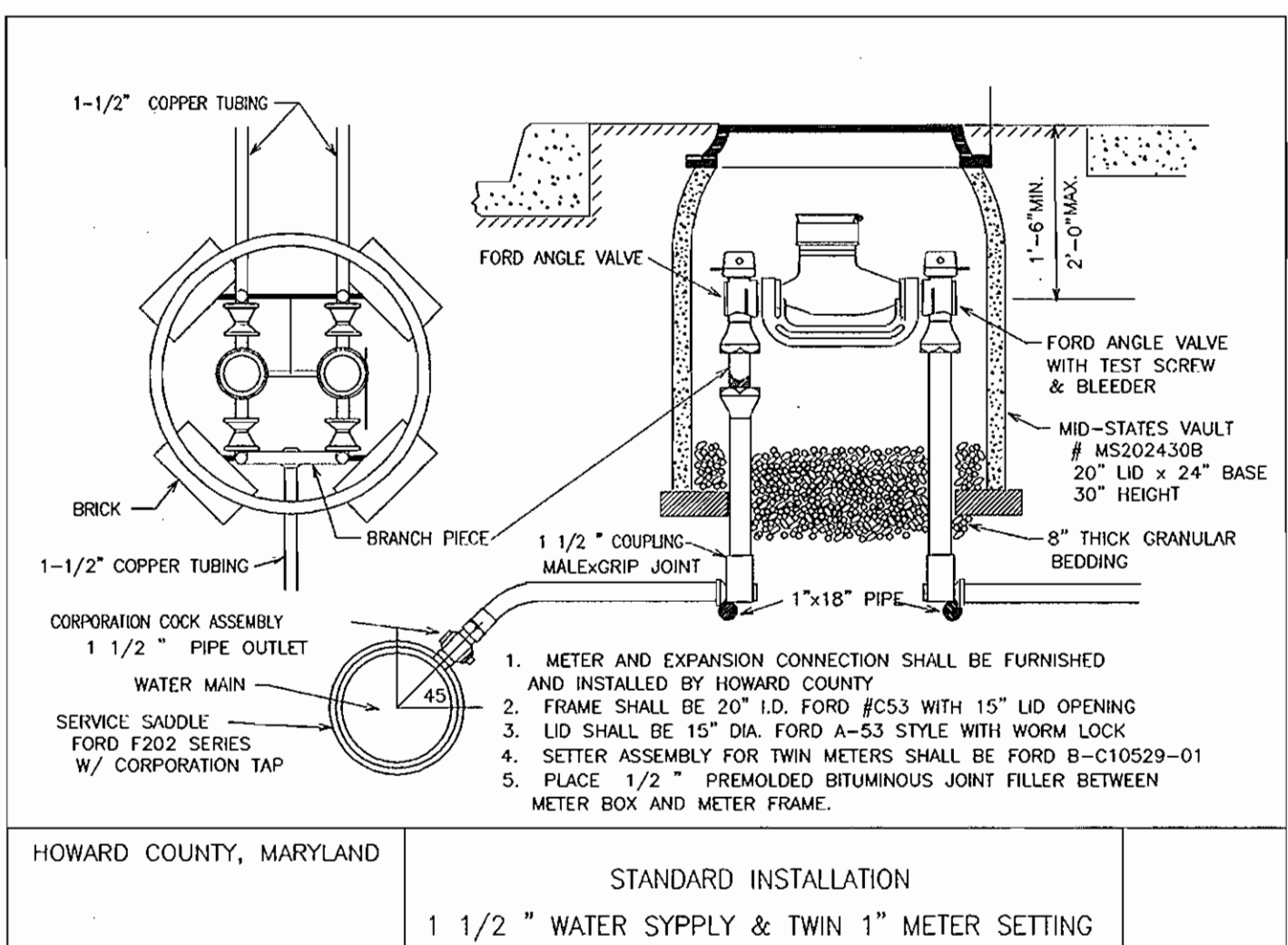
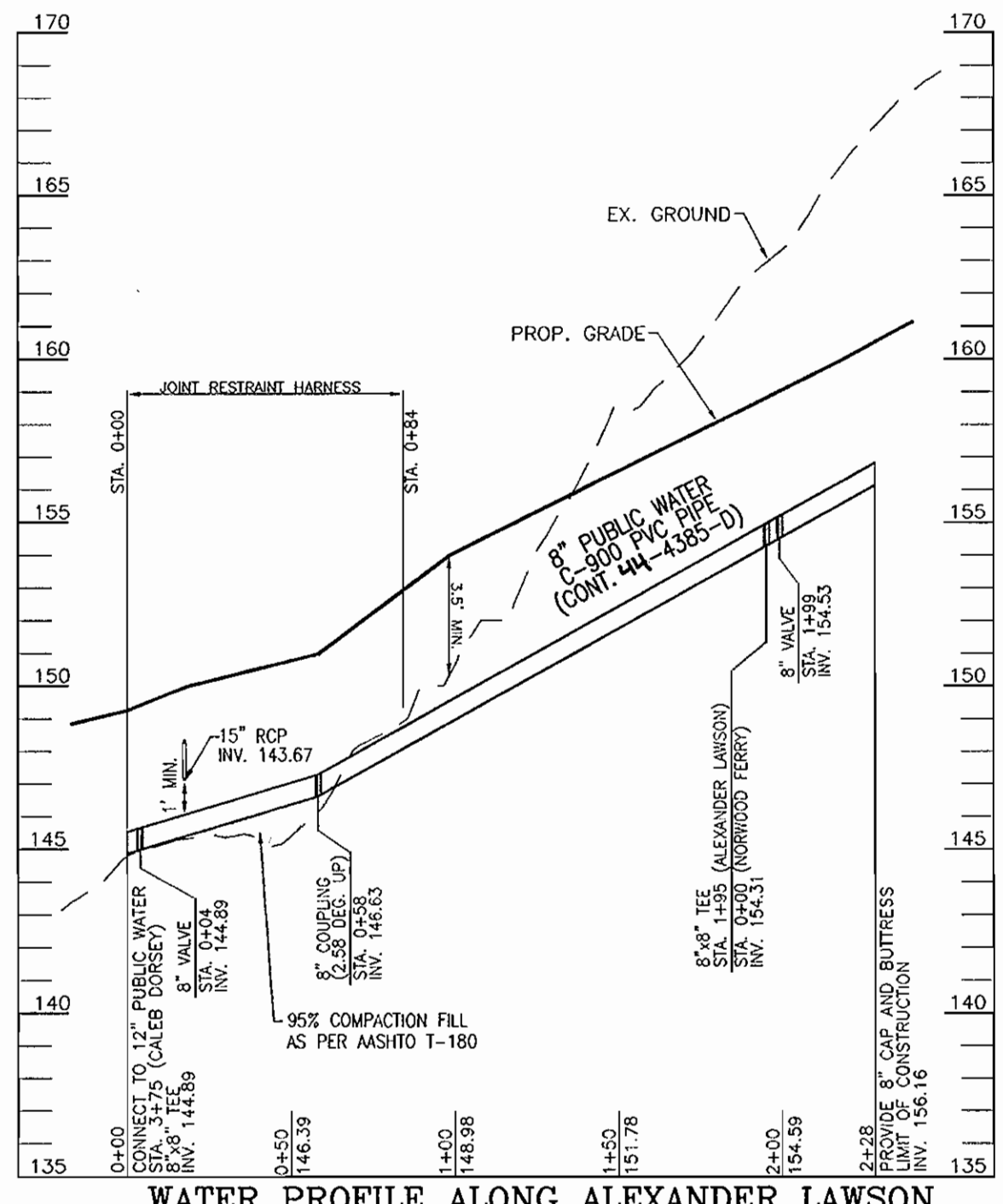
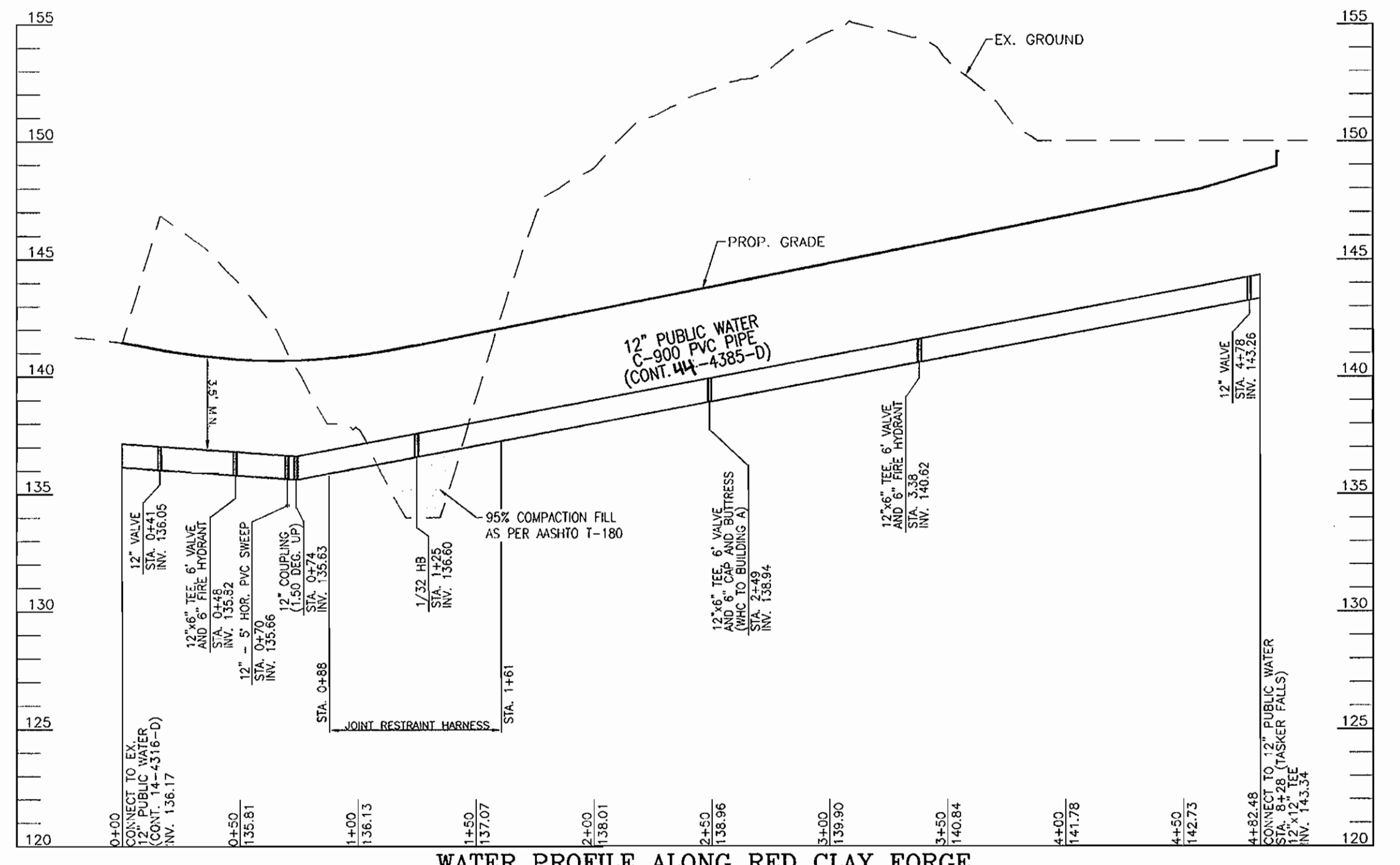
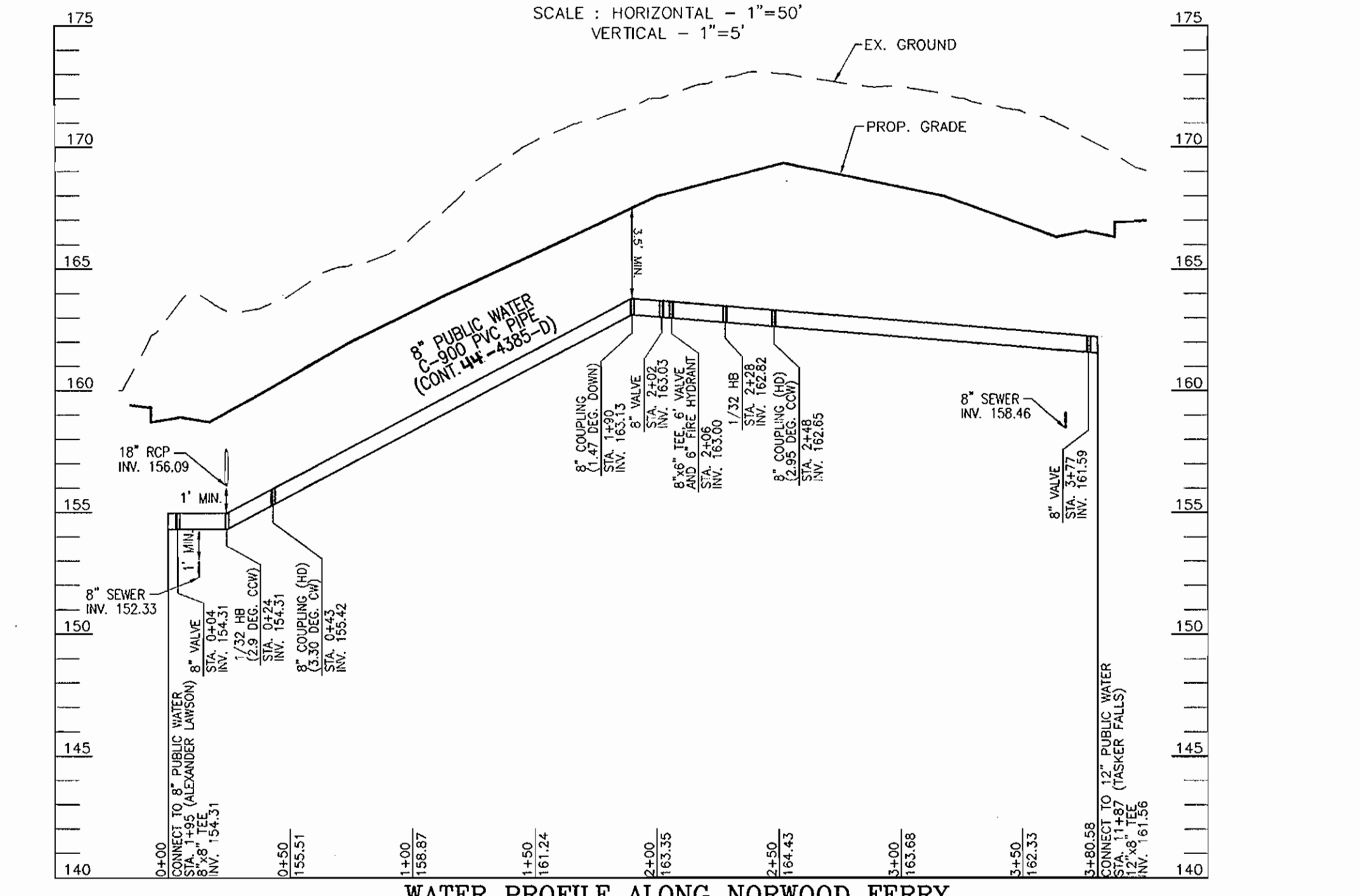
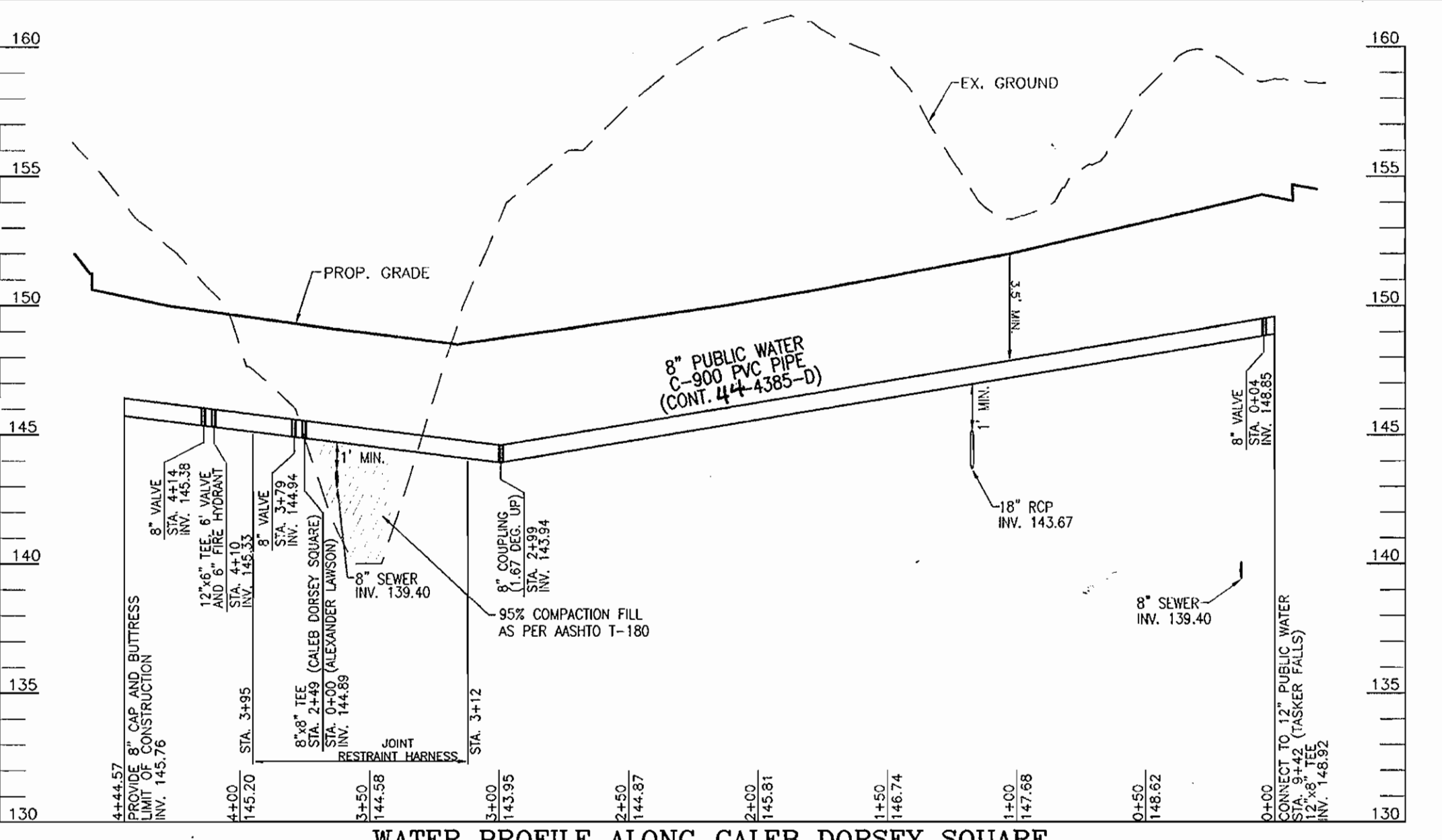
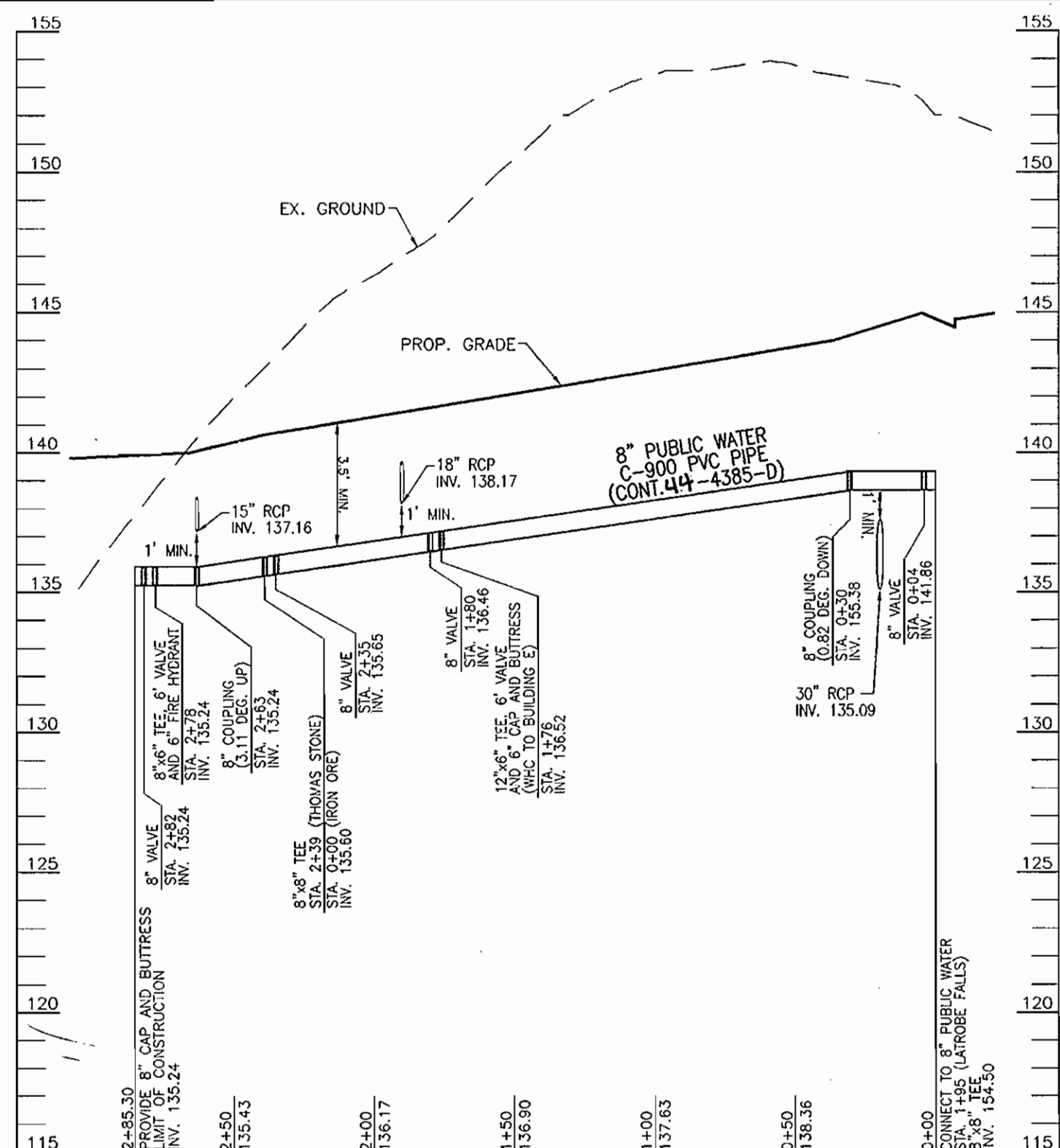
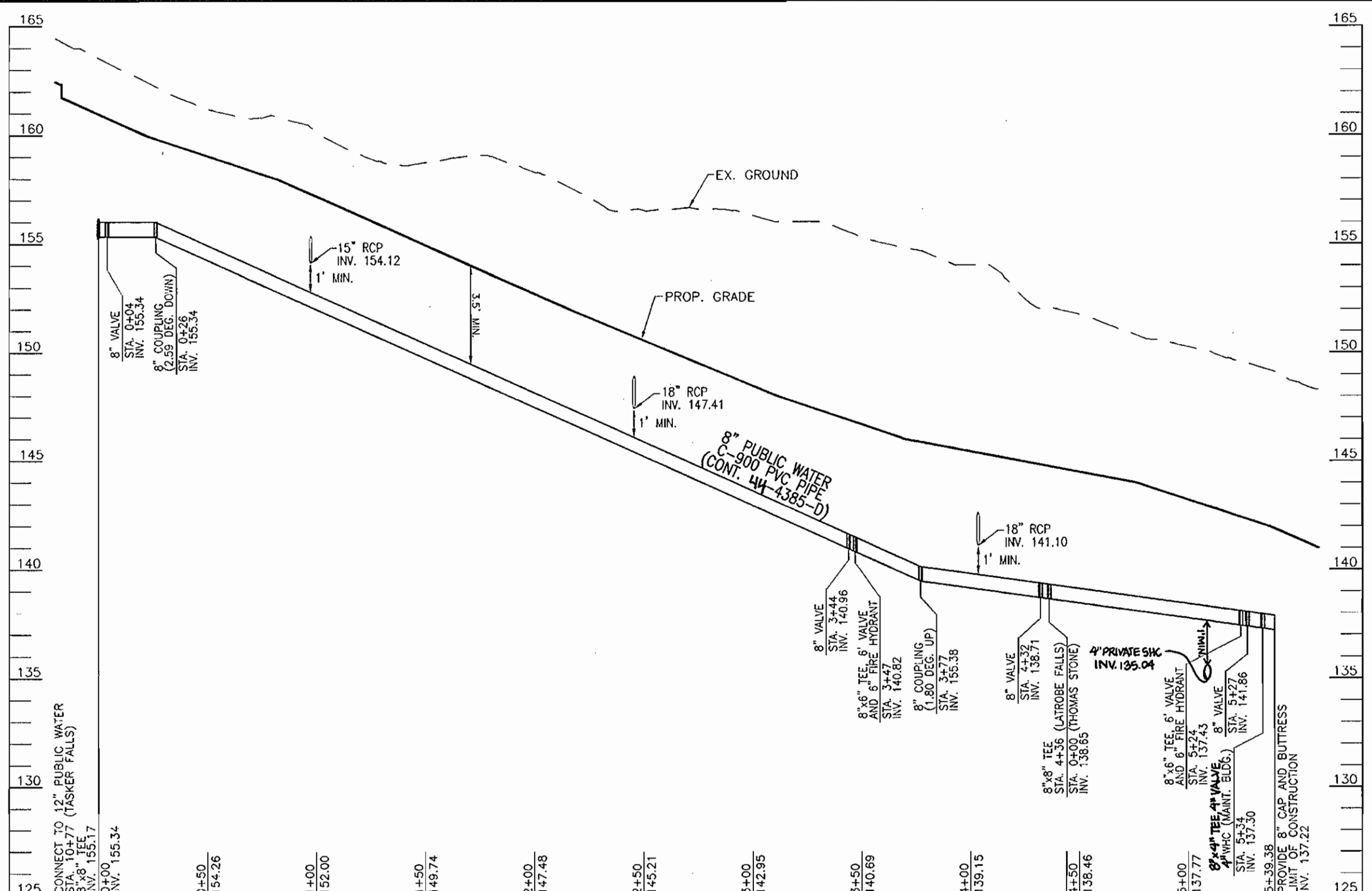
BELMONT STATION
PARCELS A, B, C AND OPEN SPACE LOT 1
REF: S-04-10, P-05-17, W-04-152, W-05-76, PLATS 1462-71

CONTRACT NO. 44-4385-D

TAX MAP 37, BLOCK 18
1ST ELECTION DISTRICT

PARCELS 196, 198, 199
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 3 OF 4

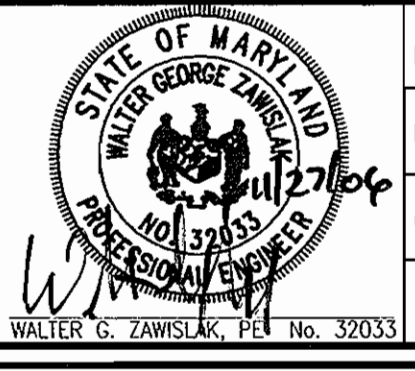


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CHIEF, DEVELOPMENT ENGINEERING DIVISION

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DES:	DZ		
DRN:	DZ		
CHK:	WGZ		
DATE:	NOV. 28, 2006		
BY:	RHV	1	REVISE W/C TO UNIT 41 TO A TWIN FOR UNITS 46 AND 91; REVISE W/C AND S/C TO MAINTENANCE BUILDING
			4-20-07

FINAL WATER PLAN PROFILES
600' SCALE MAP NO. 37
BLOCK NO. 18

BELMONT STATION
PARCELS A, B, C, AND OPEN SPACE LOT 1
REF: S-04-10, P-05-17, WF-04-152, WF-06-78; PLATS 1862-21
CONTRACT NO.-44-4385-D
TAX MAP 37, BLOCK 18
1ST ELECTION DISTRICT
PARCELS 196, 198, 199
HOWARD COUNTY, MARYLAND
SCALE AS SHOWN
SHEET 4 OF 4

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