

ITEMS	QUANTITIES		AS-BUILT		MANUFACTURER/SUPPLIER
	ESTIMATED		QUANTITIES	TYPE	
6" WATER MAIN (F.H.)	213 LF	214 LF	PVC	NATIONAL PIPE AND PLASTICS	
6" WATER MAIN (C400 PVC DR 14)	123 LF	123 LF	PVC	NATIONAL PIPE AND PLASTICS	
8" WATER MAIN (C400 PVC DR 14)	2,917 LF	2,917 LF	PVC	NATIONAL PIPE AND PLASTICS	
8" x 6" F.H.T.	15 EA	15 EA	EPOXY	TYLER/UNION FOUNDRY	
6" V.	12 EA	12 EA	MJ GATE	TYLER/UNION FOUNDRY	
8" V.	12 EA	13 EA	MJ GATE	TYLER/UNION FOUNDRY	
8" x 8" T	5 EA	5 EA	EPOXY	TYLER/UNION FOUNDRY	
8" x 6" T	3 EA	3 EA	EPOXY	TYLER/UNION FOUNDRY	
8" x 8" CROSS	2 EA	2 EA	EPOXY	TYLER/UNION FOUNDRY	
FIRE HYDRANT	15 EA	15 EA	A-423	MUELLER COMPANY	
8" 3.0" HDC (HORIZ.)	1 EA	1 EA	PLASTIC	NORTH AMERICAN PIPE SPECIALIST	
8" 0.5" HDC (VERT.)	3 EA	3 EA	PLASTIC	NORTH AMERICAN PIPE SPECIALIST	
8" 1.0" HDC (VERT.)	5 LF	5 EA	PLASTIC	NORTH AMERICAN PIPE SPECIALIST	
8" 1.5" HDC (VERT.)	8 EA	8 EA	PLASTIC	NORTH AMERICAN PIPE SPECIALIST	
8" 2.0" HDC (VERT.)	1 EA	1 EA	PLASTIC	NORTH AMERICAN PIPE SPECIALIST	
8" 3.0" HDC (VERT.)	2 EA	2 EA	PLASTIC	NORTH AMERICAN PIPE SPECIALIST	
8" 1/32 V.B.	2 EA	2 EA	EPOXY	TYLER/UNION FOUNDRY	
8" 1/16 H.B.	2 EA	2 EA	EPOXY	TYLER/UNION FOUNDRY	
8" 1/8 H.B.	1 EA	1 EA	EPOXY	TYLER/UNION FOUNDRY	
8" 1/8 H.B.	1 EA	1 EA	EPOXY	TYLER/UNION FOUNDRY	
8" SEWER MAIN (PVC)	1,702 LF	1,702 LF	PVC	NATIONAL PIPE AND PLASTICS	
4" MANHOLE	18 EA	18 EA	CONCRETE	CONTRACTORS PRECAST CORP.	

NAME OF UTILITY CONTRACTOR: **HIGHLAND TURF INC. (HTI)**

SURVEY AND DRAFTING DIV.	CHECKBOX: AS-BUILT DATE:
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**DESIGN MANUAL WAIVER INFORMATION:**

VOLUME II DESIGN MANUAL WAIVER ON DECEMBER 30, 2016, THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS GRANTED A DESIGN MANUAL WAIVER TO SECTIONS 3.3.B.2.2, 4.3.B.2.D AND 5.4.B.1 OF THE HOWARD COUNTY DESIGN MANUAL, VOL. II, WITH THE FOLLOWING UNDERSTANDING: SHOULD CIRCUMSTANCES CHANGE AS THE DESIGN PROCEEDS FORWARD, AND THESE MINIMUM CLEARANCES BETWEEN:

- 1) WATER AND SEWER OF NO LESS THAN 10 FEET HORIZONTALLY (CENTER-TO-CENTER) OR
- 2) NO LESS THAN 6 FOOT VERTICAL CLEARANCE OF WATER ABOVE SEWER WHEN NECESSARY AND/OR
- 3) NO LESS THAN 5 FEET HORIZONTALLY TO ANY OTHER UTILITY (OUTSIDE TO OUTSIDE) ARE FOUND TO NOT BE ACHIEVABLE, THEN REVIEW AND APPROVAL IS REQUIRED.

**DESIGN MANUAL WAIVER INFORMATION:**

VOLUME II DESIGN MANUAL WAIVER ON DECEMBER 7, 2017, THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS GRANTED A DESIGN MANUAL WAIVER TO SECTION 5.4.B.4 OF THE HOWARD COUNTY DESIGN MANUAL, VOL. II, ALLOWING THE MINIMUM CLEARANCE BETWEEN WATERSEWERS AND OTHER UTILITIES FROM 5 FEET TO 3 FEET. THE WAIVER CAME WITH THE FOLLOWING UNDERSTANDING:

THE CONDITIONED APPROVAL PROVIDED HEREIN IS APPLICABLE TO THE 26 "PINCH" POINTS (NUMBERED 1 THROUGH 26, SKIPPING 18 AND 26) DESCRIBED AND SHOWN ON THE ACCOMPANYING EXHIBIT "EXHIBIT A" WAS SUBMITTED AS PART OF THE ORIGINAL OCTOBER 10, 2017 DESIGN MANUAL WAIVER REQUEST. THE CONDITIONAL APPROVAL SHALL NOT BE CONSIDERED A WAIVER TO THE REQUIREMENTS OF DESIGN MANUAL VOLUME II - WATER AND SEWER, SECTION 5.4.B.4 FOR THE "ENTIRE" LIMITS OF THE SUBJECT CONTRACT PLANS.

REVISED MINIMUM CLEARANCE BETWEEN WATERSEWER AND STORM DRAIN STRUCTURES: THE NOVEMBER 20, 2017 LETTER REQUESTED A REDUCTION OF THE MINIMUM CLEARANCE BETWEEN WATERSEWER AND STORM DRAIN STRUCTURES FROM 5 FEET TO 2.7 FEET TO ACCOMMODATE "PINCH" POINT 16, WHERE THE MINIMUM CLEARANCE IS LESS THAN 3 FEET. THIS REDUCTION IS FOR "PINCH" POINT 16 ONLY IN CONSIDERATION THAT IT IS SHOWN IN THE ORIGINAL EXHIBIT ACCOMPANYING THE OCTOBER 10, 2017 LETTER AS 2.7 FEET, AND THERE DOES NOT APPEAR TO BE A FEASIBLE LAYOUT ADJUSTMENT TO IMPROVE THE CLEARANCE.

"PINCH POINTS" 24 AND 26: AS REQUESTED IN THE ORIGINAL WAIVER RESPONSE, THE LAYOUT SURROUNDING "PINCH" POINTS 24 AND 26 HAVE BEEN ADJUSTED SUCH THAT THE LONGITUDINAL ALIGNMENT OF THE STORM DRAIN IS NO LONGER BETWEEN THE WATER AND SEWER MAINS, AND THAT 5 FEET OF CLEARANCE BETWEEN WATERSEWER AND STORM DRAINS HAS BEEN PROVIDED; THEREFORE, WAIVERS FOR THESE "PINCH" POINTS ARE NO LONGER NECESSARY.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 308 OF THE SPECIFICATIONS & WITH SDP-17-027 AND F 17-059

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

APPROVED: *John R. Roberts* 1/17/18  
HOWARD S.C.D. Date

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
*Chris Edmon* 1/17/18  
BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING AND ZONING  
HOWARD COUNTY, MARYLAND  
*Chris Edmon* 1-24-18  
CHIEF, DEVELOPMENT ENGINEERING DIVISION, DATE

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
BURTONSVILLE, MARYLAND 20886  
TEL: 301-421-4024 FAX: 301-989-2524 FAX: 301-421-4186

DATE DEC., 2017  
G.L.W. No. 11071

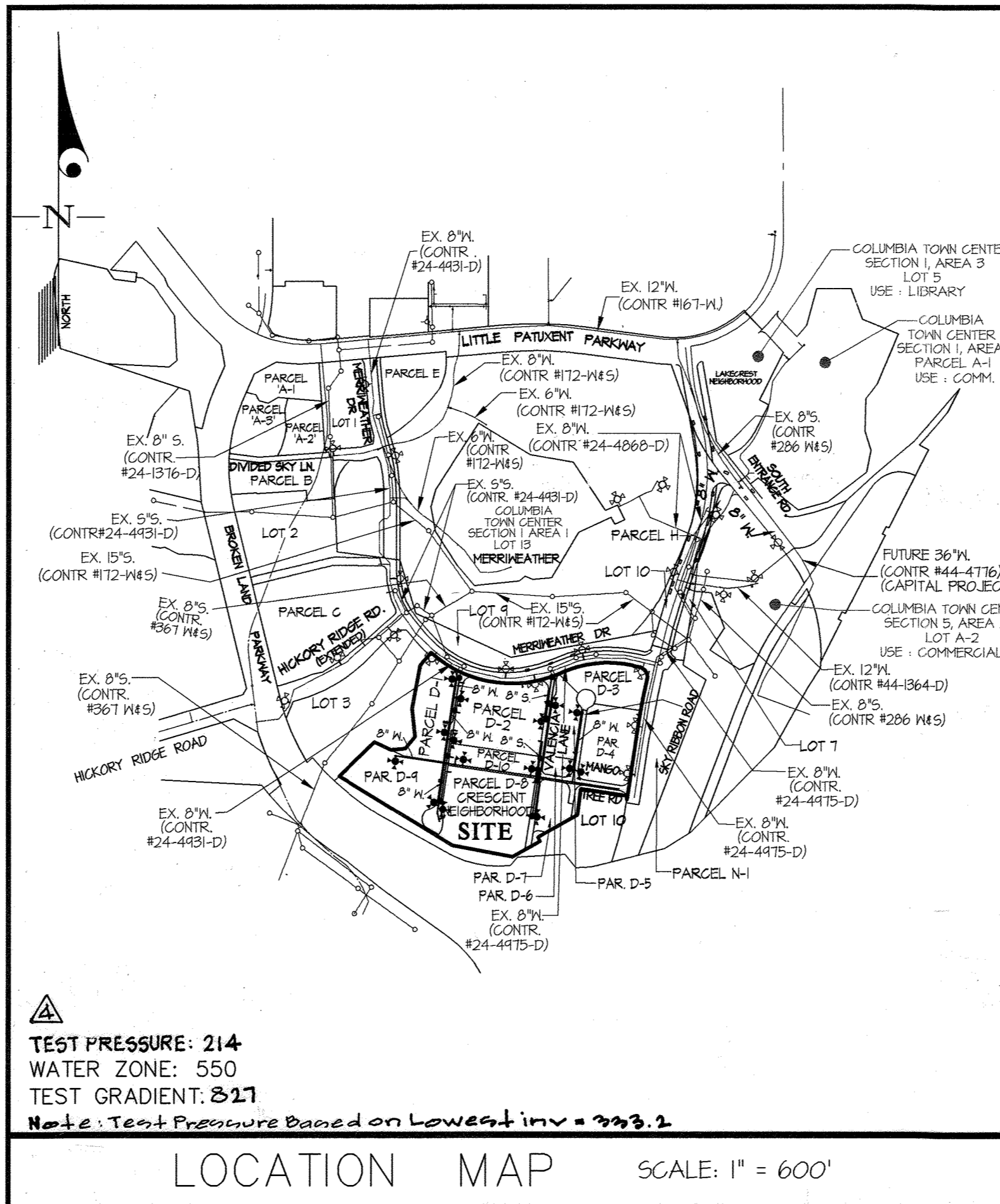
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 12975  
EXP. DATE: MAY 26, 2018  
*Chris Edmon*

WRA	AS-BUILTS	10-12-20
3+	Revised Test Information	7-13-19
3+	Revised Connection size & quantities	8-8-18
3+	Revised quantities	6-16-18
3+	ADDED MANHOLES ON SEWER MAIN AT SEWER HOUSE CONNECTIONS	5-9-18
BY	NO	REVISION
DATE	600' SCALE MAP NO. 36	BLOCK NO. 1

COVER SHEET

**DOWNTOWN COLUMBIA**  
CONTRACT No. 24-4974-D  
CRESCENT NEIGHBORHOOD  
PARCELS D-1 THRU D-14, NON-BUILDABLE BULK PARCELS  
D-15 THRU D-17 AND OPEN SPACE LOT 10  
A RESUBDIVISION OF PARCEL D & LOT 4  
HOWARD COUNTY, MARYLAND  
ELECTION DISTRICT NO. 5

SCALE AS SHOWN  
SHEET 1 OF 4



TEST PRESSURE: 214  
WATER ZONE: 550  
TEST GRADIENT: 8.27  
Note: Test Pressure Based on Lowest Inv. = 323.2

TYPE OF BUILDING	COMMERCIAL
NUMBER OF LOTS	1 LOT/10 PARCELS
NUMBER OF S.H.C.'s	10
NUMBER OF W.H.C.'s	0
AREA OF COMMERCIAL LOT/PARCEL	25.1 AC.
SEWER SHED	MIDDLE PATUXENT
PUMPING STATION	LITTLE PATUXENT RECLAMATION PLANT

**SHEET INDEX**

- 1 - COVER SHEET
- 2 - WATER & SEWER PLAN
- 3 - WATER & SEWER PROFILES
- 4 - WATER & SEWER PROFILES

**GENERAL NOTES**

1. Approximate locations 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.
2. Topographic field surveys were performed on December, 2008 by McKenzie SNTDER.
3. Horizontal and Vertical Survey Controls: The coordinates shown on the drawings are based on Maryland State Reference System NAD 83/11 as projected by Howard County Geodetic Control Stations No. 36AA and No. 36GA.
4. All vertical controls are based on NAVD 88. Vertical controls provided on the drawings are (Engineering / Survey Firm shall provide description of vertical control points, i.e., iron bars, cross cuts on concrete structures, etc.).
5. All pipe elevations shown are invert elevations unless otherwise noted on the plans.
6. Clear all utilities by a minimum of 12 inches. Clear all poles by 5'-0" minimum or taller as required unless otherwise noted. The owner has contacted the utility companies and has made arrangements for bracing of poles as shown on the drawings. In the event the contractor's work requires the bracing of additional poles, any cost incurred by the owner for the 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.
7. For details not shown on the drawing, 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.
8. Where test pits have been made on existing utilities, they are noted by the symbol (circle with a cross) at the locations of the test pits. A note 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 operations at his own expense.
9. The contractor shall notify the following utility companies or agencies at least five working days before starting work shown on these plans:
  - ATTN: 1-800-252-1193
  - BGE (Construction Services) 410-637-8713
  - BGE (Emergency) 410-695-0123
  - Bureau of Utilities 410-313-4200
  - Colonial Pipeline Co. 410-748-1930
  - Miss Utility 1-800-251-7111
  - State Highway Administration 410-531-5533
  - Verizon 1-800-743-0033
10. 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.
11. 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 construction of the main.
12. The contractor shall notify the Bureau of Highways, Howard County, at (410)-313-7450 at least five working days before open cutting or crating/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(a) of the Howard County Code.

**Part II WATER**

1. All water mains shall be PVC, unless otherwise noted.
2. Tops of all water mains shall have a minimum of 3'-6" of cover unless otherwise noted.
3. Valves adjacent to tees shall be strapped to tees.
4. All fittings shall be buttressed or anchored with concrete in accordance with Standard Details unless otherwise provided for on the drawings.
5. Fire hydrants shall be set to the bury line elevations shown on the drawings. All fire hydrants shall be installed in accordance with Standard Details. The soil around the fire hydrant shall be compacted in accordance with Section 1000 and Section 1005 of the Standard Specifications.
6. The contractor shall not operate any water main valves on the existing water system.
7. Tracer wires and continuity test stations shall be installed on all DIP and PVC water mains in accordance with the Howard County Design Manual.
8. For PVC water mains, all records for the Quality Control and Qualification Test Requirements noted in Section 51 of the ANMA Standard C400 for PVC pressure pipe shall be submitted with the pipe material certifications or shop drawings prior to approval of the material for use. The test records shall be for the pipe to be installed under this contract. All PVC pipe shall contain markings to allow cross referencing of the pipe supplied to the test records received.
9. Unless otherwise noted on the plans or in the specifications sacrificial anodes shall be installed on all valves and metallic fittings used with PVC water mains in accordance with Volume IV, Standard Specifications and Details for Construction, Seventeen (17) pound Magnesium anodes shall be installed on all valves and ductile iron fittings including restraints and harnesses. Twelve (12) pound Zinc anodes shall be installed on all stainless steel fittings and saddles used with PVC mains. All tees used with PVC mains shall be ductile iron.
10. Proper Assembly of Gasketed PVC Pipe Joints: The manufacturer's insertion line of gasketed PVC pipe joints indicates the maximum depth of insertion of the spigot into the bell. After assembly of the joint, the insertion line shall remain visible. Dual insertion lines on gasketed PVC pipe indicate the maximum and minimum depth of insertion of the spigot into the bell. The contractor shall not over insert or over torque the spigot into the bell of PVC pipe.
11. All changes in horizontal or vertical direction of PVC water pipe shall be made with standard bends, 5-degree sweeps or high deflection (HD) couplings. No bending of the pipe or deflecting of PVC pipe joints is permitted. Where high deflection couplings or 5-degree sweeps are permitted, the contractor shall provide one full pipe length (20-foot long) on either side of the high deflection coupling or 5-degree sweep. The contractor shall use a vibratory plate compactor or other approved means to thoroughly compact the #57 stone on both sides of the high deflection coupling or 5-degree sweep, taking care not to use compaction equipment directly over the fitting.

PVC high deflection couplings shall be limited to a total deflection of 3-degrees (1/4-degree on either end of the coupling), shall be rated for a minimum 200 psi meeting the requirements of ANMA C400, shall have a minimum lay length of 4-inches and shall have center stops. PVC high deflection couplings shall be CertainTeed PVC High Deflection (HD) Stop Couplings or equal.

Five degree sweeps shall be bell by spigot, rated for a minimum 225 psi, DR18 meeting the requirements of ANMA C400 and shall be Multi Fittings (pex) Blue Brute DR18 or equal.

When PVC high deflection couplings or PVC 5-degree sweeps are used to facilitate changes in horizontal or vertical alignments of ANMA C-400 PVC pipelines, the contractor shall install devices for the prevention of over-insertion of the PVC pipe spigots or plan ends into the push on bell joint on both sides of the high deflection couplings and 5 degree sweeps. Bell stops shall be placed at the proper insertion line for the fitting. The bell stop shall be manufactured of ductile iron and incorporate an expansion retention spring to allow for pipe expansion and contraction. The bell stops shall be Series 5000 Mega-Stop, as manufactured by EBAA Iron, Inc. or approved equal.

**Part III SEWER**

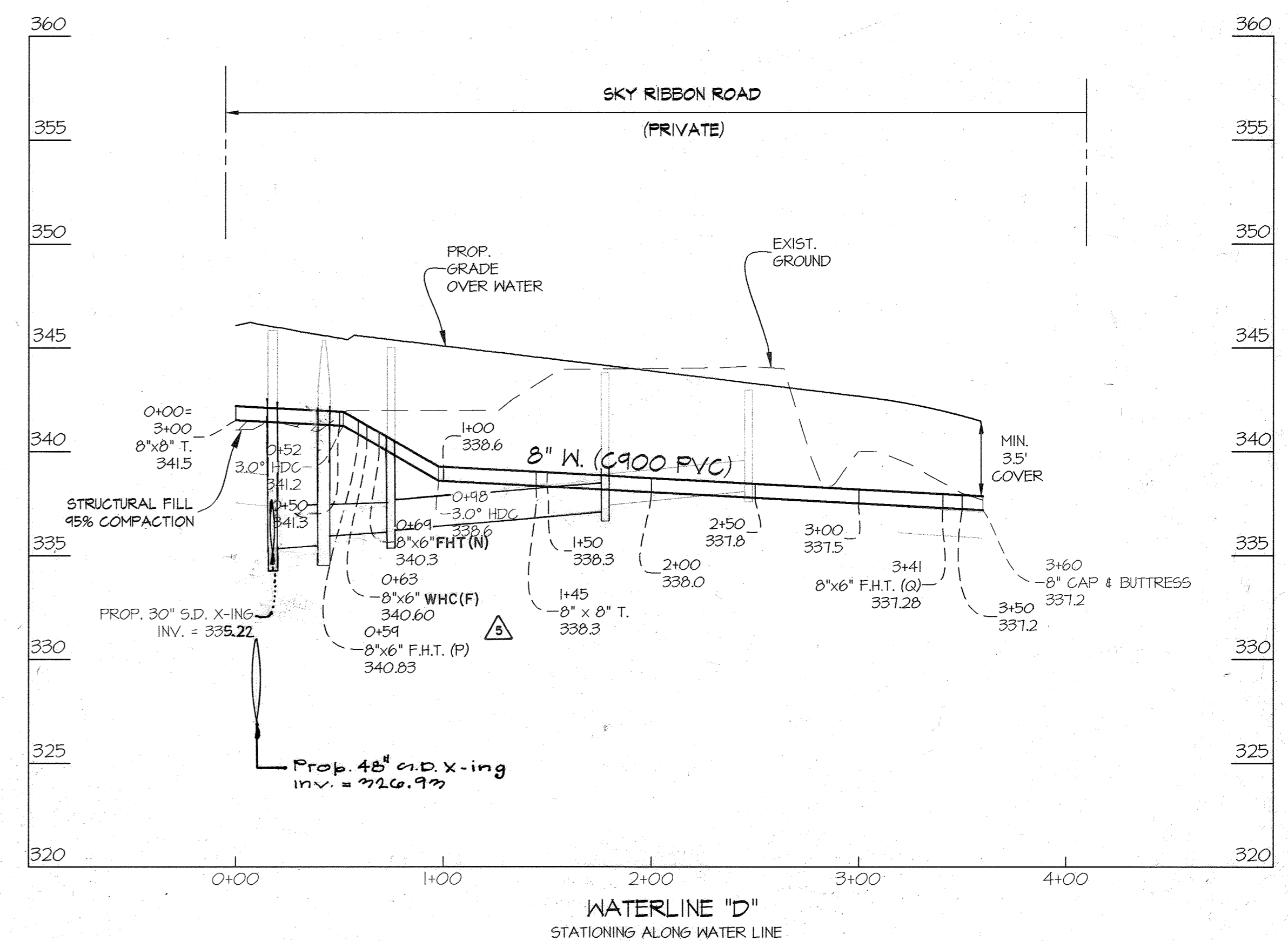
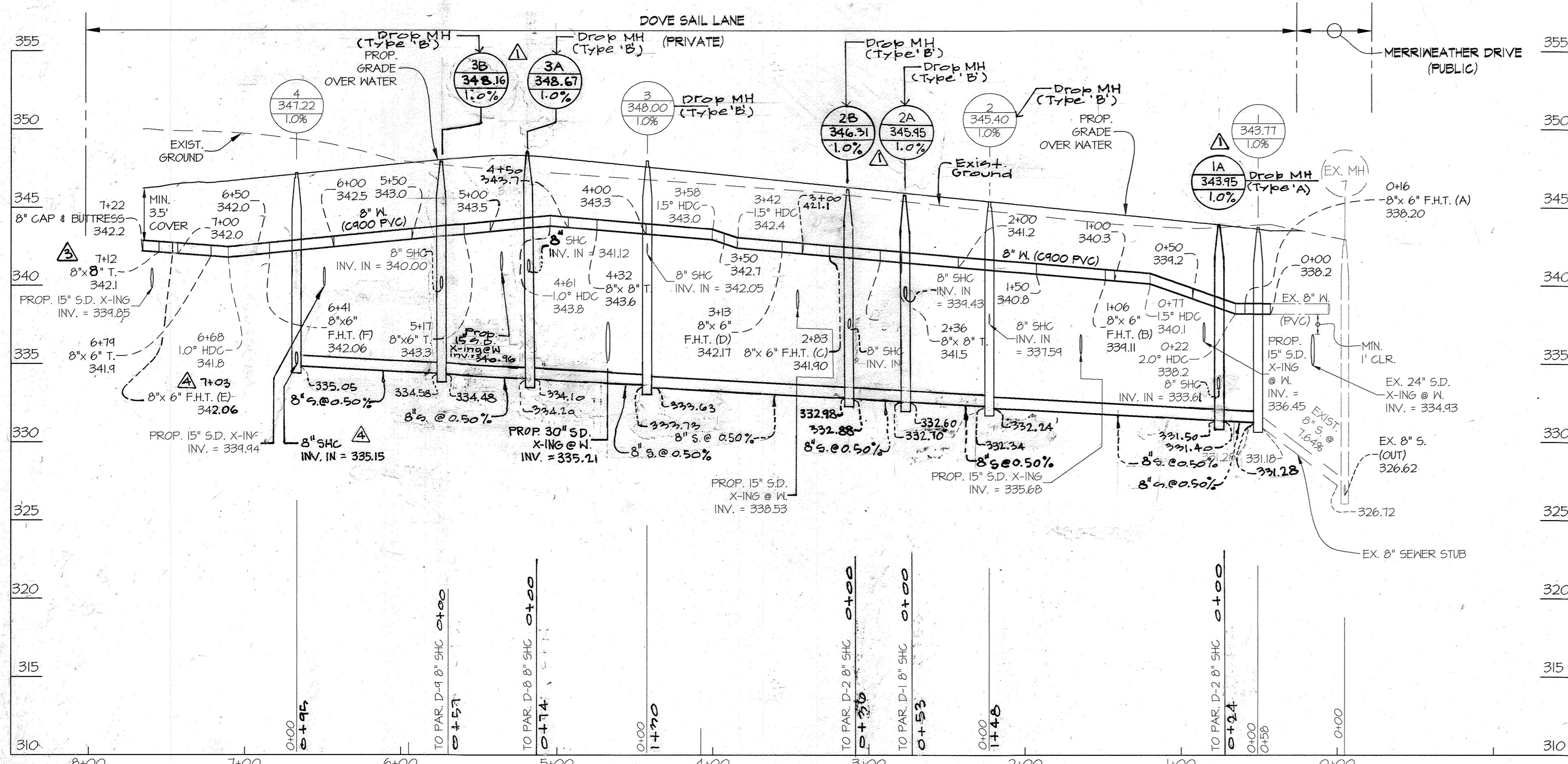
1. All sewer mains shall be D.I.P. or PVC, unless otherwise noted.
2. All manholes shall be 4'-0" inside diameter unless otherwise noted.
3. Force mains shall be D.I.P. only.
4. Manholes shown with 12" and 16" walls are for brick manholes only.
5. Manholes designated M.T. in plan and profile shall have watertight frame and cover, Standard Detail 65.52. Where watertight manhole frames and covers are used, set top of frame 1'-6" above finished grade unless otherwise noted on the drawings.
6. House(s) with the symbol (circle with a cross) indicates that the cellar cannot be served.

PREPARED FOR:  
THE HOWARD RESEARCH AND DEV. CORP.  
10480 LITTLE PATUXENT PARKWAY  
SUITE 400  
COLUMBIA, MARYLAND 21044  
ATTN: BILL ROWE  
410-964-4987

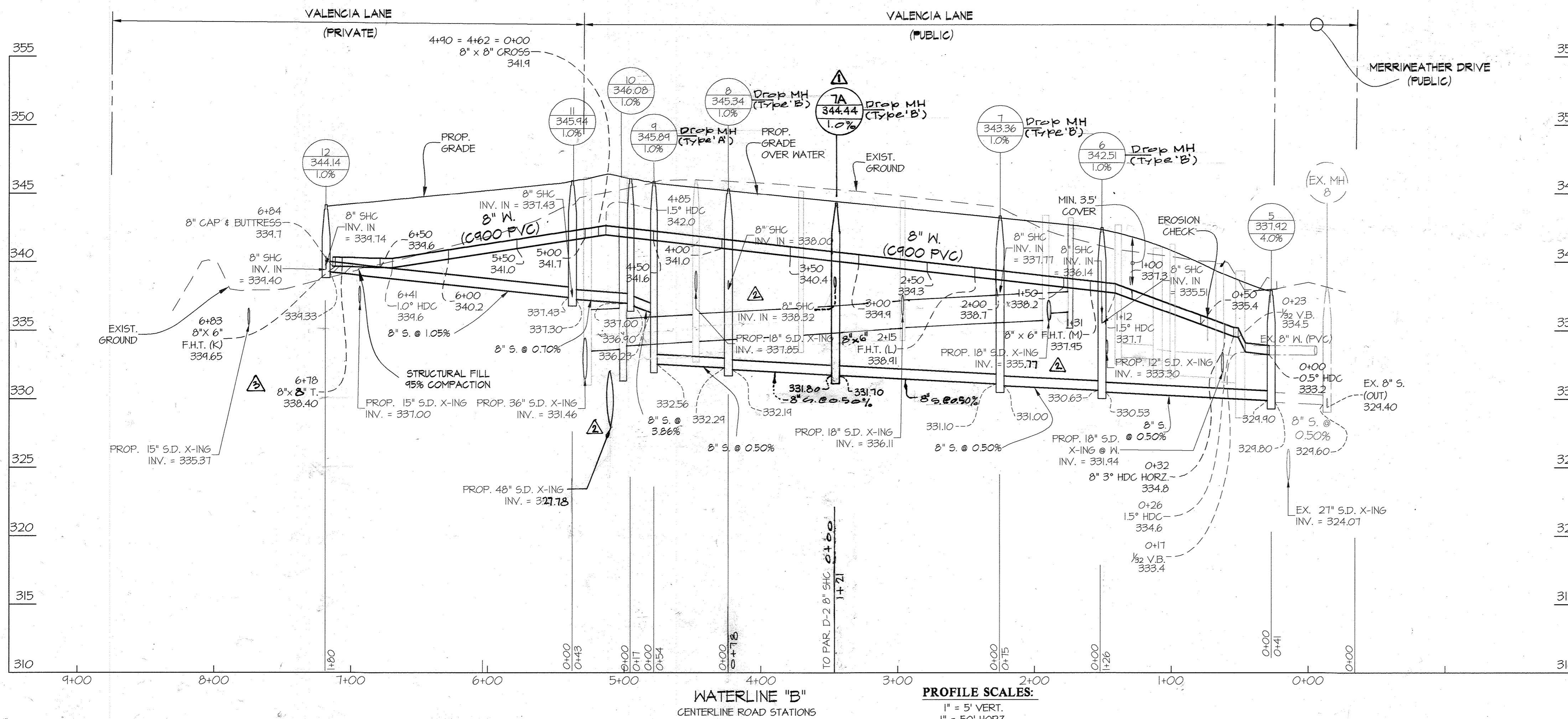








PROFILE SCALES:  
 1" = 5' VERT.  
 1" = 50' HORIZ.



PROFILE SCALES:  
 1" = 5' VERT.  
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 THE HOWARD RESEARCH AND DEV.  
 CORP.  
 10480 LITTLE PATUXENT PARKWAY  
 SUITE 400  
 COLUMBIA, MARYLAND 21044  
 ATTN: BILL ROWE  
 410-964-4987

FOR WATER AND SEWER PLAN SEE SHEET 2 OF 4

DEPARTMENT OF  
 PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 DATE: 1-24-18

DEPARTMENT OF  
 PLANNING AND ZONING  
 HOWARD COUNTY, MARYLAND  
 DATE: 1-24-18

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 BAL: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

DATE  
 DEC.,  
 2017

PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE PLANS  
 WERE PREPARED OR APPROVED BY ME,  
 AND THAT I AM A DULY LICENSED  
 PROFESSIONAL ENGINEER UNDER THE  
 LAWS OF THE STATE OF MARYLAND,  
 LICENSE NO. 12975  
 EXP. DATE: MAY 26, 2018



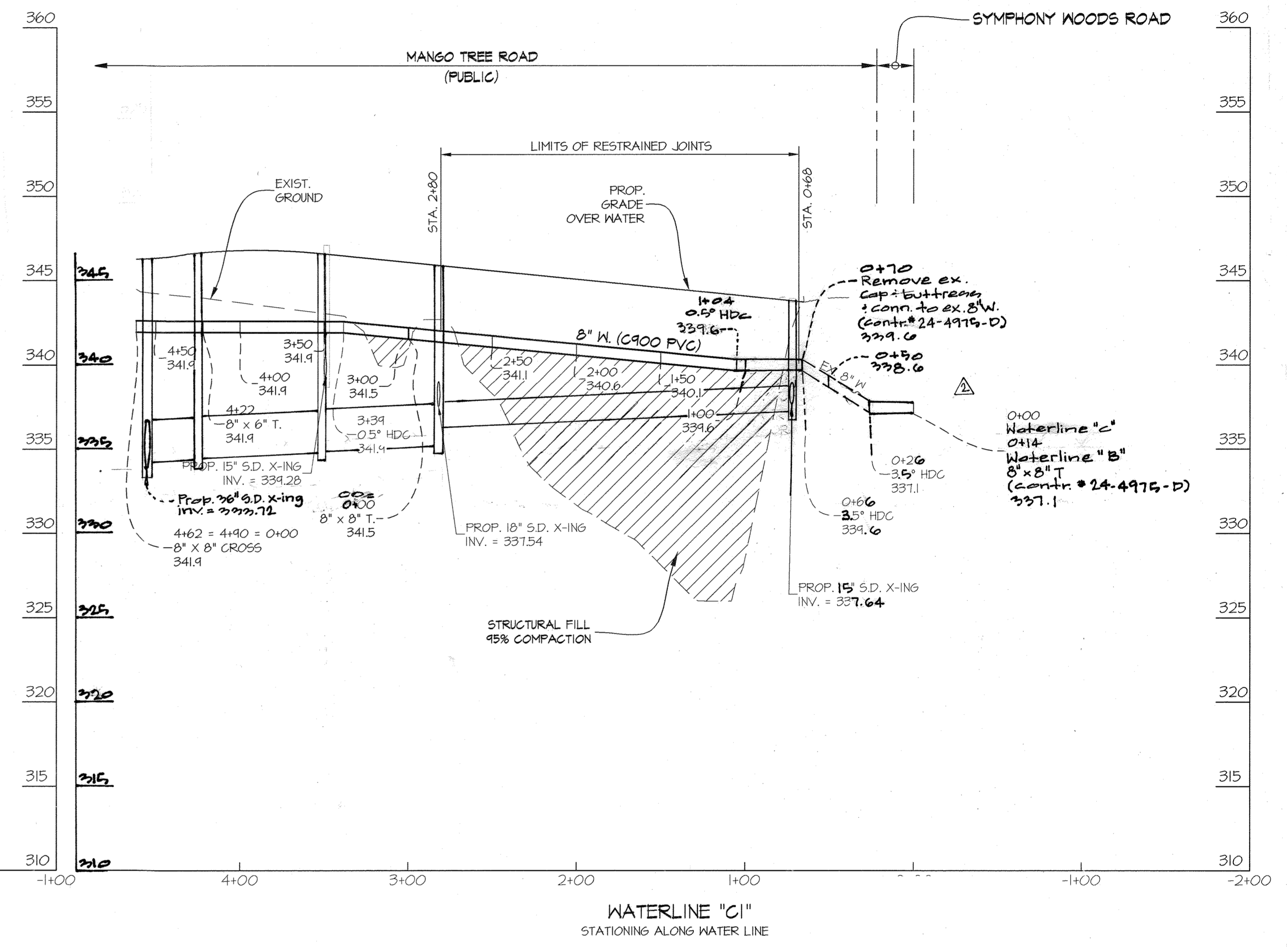
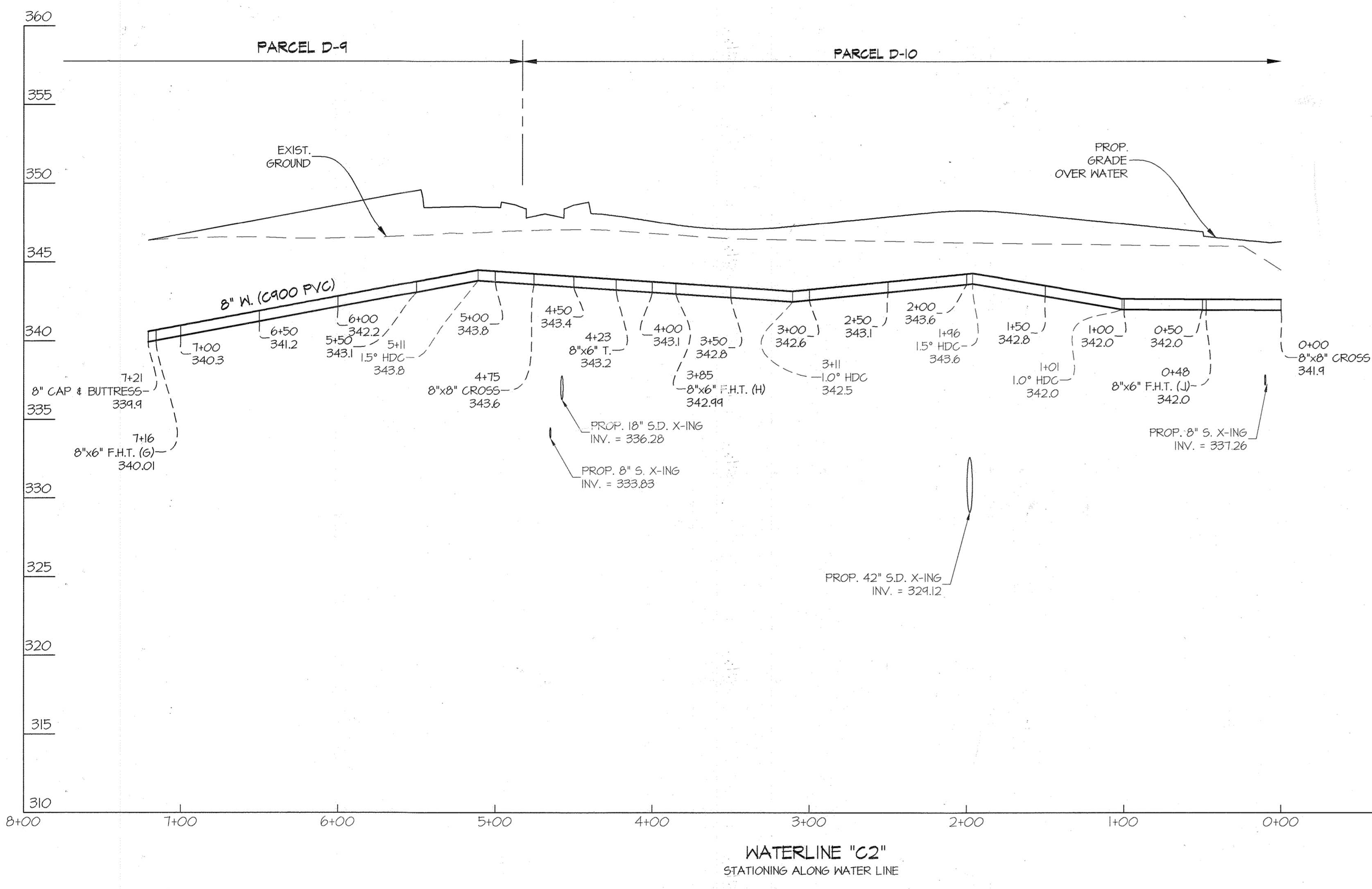
BY	NO	REVISION	DATE
WRA	1	AS-BUILT	10-12-20
3+	2	Relocated Fire Hydrant revised etc invent	7-19-19
3+	3	Revised Connection sizes	8-9-18
3+	4	Revised storm drain in Profile	6-27-18

WATER AND SEWER PROFILES  
 600' SCALE MAP NO. 36 BLOCK NO. 1

**DOWNTOWN COLUMBIA**  
 CONTRACT No. 24-4974-D  
 CRESCENT NEIGHBORHOOD  
 PARCELS D-1 THRU D-14, NON-BUILDABLE BULK PARCELS  
 D-15 THRU D-17 AND OPEN SPACE LOT 10  
 A RESUBDIVISION OF PARCEL D & LOT 4  
 HOWARD COUNTY, MARYLAND  
 ELECTION DISTRICT No. 5

SCALE  
 AS SHOWN  
 SHEET  
 3 OF 4





PROFILE SCALES:  
 1" = 5' VERT.  
 1" = 50' HORIZ.

PREPARED FOR:  
 THE HOWARD RESEARCH AND DEV.  
 CORP.  
 10480 LITTLE PATUXENT PARKWAY  
 SUITE 400  
 COLUMBIA, MARYLAND 21044  
 ATTN: BILL ROWE  
 410-964-4987

FOR WATER AND SEWER PLAN SEE SHEET 2 OF 4

DEPARTMENT OF  
 PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 [Signature]  
 CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF  
 PLANNING AND ZONING  
 HOWARD COUNTY, MARYLAND  
 [Signature]  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

**GLW** GUTSCHICK LITTLE & WEBER, P.A.  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
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DATE  
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 2017  
 G.L.W. No.  
 11071  
 PROFESSIONAL CERTIFICATION  
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 PROFESSIONAL ENGINEER UNDER THE  
 LAWS OF THE STATE OF MARYLAND,  
 LICENSE NO. 12975  
 EXP. DATE: MAY 26, 2018  
 [Signature]

34	Revised Waterline "C1"	6-27-18
BY	NO	DATE

WATER EXTENSION PROFILE  
 600' SCALE MAP NO. 36 BLOCK NO. 1

**DOWNTOWN COLUMBIA**  
 CONTRACT No. 24-4974-D  
 CRESCENT NEIGHBORHOOD  
 PARCELS D-1 THRU D-14, NON-BUILDABLE BULK PARCELS  
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 HOWARD COUNTY, MARYLAND  
 ELECTION DISTRICT No. 5

SCALE  
 AS SHOWN  
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 4 OF 4