July 24, 2020

ADDENDUM #2

NOTICE TO ALL BIDDERS FOR
CITY OF WINCHESTER

ITB #202005 – Valley Avenue Improvements

This Addendum forms a part of the Contract Documents and modifies the original bidding documents for ITB #202005 dated May 2020. *Bidders shall acknowledge receipt of the Addendum in the space provided on the Bid Form and return a signed copy with your bid.*

This Addendum consists of 51 total pages. The following information shall modify and clarify the Contract Documents:

1. The date of the bid opening has been modified. Bids will now be due at **2:00 p.m. on Wednesday, August 19, 2020.**
2. The Bid Form has been revised and is attached.
3. The Drawings have been revised and can be downloaded.
4. The Technical Specification for Water Distribution System has been revised and is attached.
5. The Technical Specification for Sanitary Sewer Collection System has been revised and is attached.
6. There have been numerous additions made to the water and sewer replacements for this project that are included in the revised Bid Form. The original plans have been modified with color showing this information and are attached.
7. Survey information for the existing sanitary sewer collection system is attached.
8. The written Questions and Answers are binding and hereby made a part of the Contract Documents.
9. In cases of discrepancies within specifications, the following order of precedence shall govern:
    a. Technical Specifications in Contract Document
    b. City of Winchester – Public Services Standards Manual
    c. VDOT Road and Bridge Specifications

This Addendum must be signed and returned to the Finance Department – Purchasing Division, 4th Floor Rouss City Hall, 15 North Cameron Street, Winchester, VA 22601 by **2:00 p.m. local time on August 19, 2020** with your BID.

Receipt of Addendum #2 to Invitation to Bid #202005 is acknowledged by my signature below:

Company Name: _____

Authorized Representative: _____

Address: _____

Telephone: _____ FAX: _____

BID FORM
Valley Avenue Improvements
ITB# 202005
Updated 7-22-2020

This Bid is submitted to:

City of Winchester, Virginia
Finance Department
Rouss City Hall, 4th Floor
15 North Cameron Street
Winchester, Virginia 22601

In submitting this Bid, bidder acknowledges that the bidder has examined copies of the following Contract Documents:

BIDDING DOCUMENTS

- Invitation to Bid
- Instructions to Bidders
- Bid Form
- Bid Bond
- Non-Collusion Affidavit
- Contract
- Performance Bond
- Labor and Material Payment Bond
- Notice of Intent to Award
- Notice of Award
- Notice to Proceed
- City of Winchester Required General Terms and Conditions
- General Conditions
- Supplement to General Conditions
- Special Terms and Conditions
- Special Provisions - Utilities

TECHNICAL SPECIFICATIONS

- Scope of Work – Sequence of Construction
- Surveying
- As-Built Drawings
- Demolition
- Erosion and Sediment Control
- Rock Excavation

- Disposal of Materials
- Maintenance of Traffic
- Concrete (Curb & Gutter, Sidewalks, Entrances)
- Detectable Warning Surfaces
- Earthwork
- Topsoil and Seeding
- Retaining Walls
- Signal Mast Arms, Poles, Luminaire Arms and Sign Supports
- Emergency Vehicle Preemption Equipment
- Traffic Signal Cabinets
- Traffic Signal Controllers
- Video Detection Equipment
- Signal Head Sections
- Radio Equipment
- Storm
- Water Distribution System
- Sanitary Sewer Collection System

VDOT LOCALLY ADMINISTED PROJECT (LAP) FORMS

VDOT SUPPLEMENTS TO THE 2016 VDOT ROAD & BRIDGE SPEC BOOK

GEOTECHNICAL REPORT – BORINGS SUMMARY

DRAWINGS

ADDENDA:

NUMBER	DESCRIPTION	DATE

Receipt of all of above is hereby acknowledged.

CONTRACTOR: _____

BY (SIGNATURE): _____

NAME AND TITLE: _____

DATE: _____

BID ITEMS/QUANTITIES

(a) The Contractor shall provide all unit prices or lump sum prices for all bid items on the Bid Form herein. **If a unit price or lump sum price is omitted or left blank the bid and bidder shall be non-responsive.** The bid forms designate which prices are for *Install* only work, complete and in place, (i.e. assumes equipment and/ or materials will be supplied by the City). All other bid prices are for Furnish and Install work, complete and in place.

(b) The quantities shown for unit bid items are based upon the best information available at time of preparation of these bid documents, and are established for the purpose of obtaining a bid price. No adjustments to the bid prices based on changes to quantities will be considered. All bid prices will be held throughout the duration of the contract regardless of any increase or decrease in bid quantity.

(c) Emergency work shall be negotiated with a maximum allowable amount of 50% over the bid price by item. This excludes all lump sum bid items.

(d) All other bid items not listed or described in the Contract Documents will be negotiated between the City and the Contractor before the time of need. Once a negotiated price is established, it will be used for the remainder of the contract.

The undersigned Bidder proposes to complete all work in accordance with the Contract Documents for the following unit prices:

City of Winchester

Valley Avenue Improvements – ITB #202005
BID TABLE
Updated 7-22-2020

ITEM NO.	DESCRIPTION	VDOT/ Spec Ref	ESTIMATED QUANTITY	UNIT	UNIT COST	TOTAL COST
Mobilization						
1	Mobilization (Maximum of 3% of Total Price)	VDOT 513	1	LS		
Demolition/Removal						
2	Clearing & Grubbing	ATTD	1	LS		
3	Demolition of Existing Asphalt or Concrete, Includes Disposal	ATTD	2,500	SY		

Erosion and Sediment Control						
4	Erosion and Sediment Control	ATTD	1	LS		
Construction Surveying						
5	Construction Surveying	ATTD	1	LS		
Maintenance of Traffic						
6	Maintenance of Traffic	ATTD	1	LS		
Earthwork						
7	Regular Excavation	ATTD	4,500	CY		
8	Borrow Excavation (Select Fill)	ATTD	4,000	CY		
9	Grading	ATTD	1	LS		
10	Rock Excavation	ATTD	1,000	CY		
Sidewalk/Roadway Improvements						
11	Standard Curb, CG-2	ATTD	3,500	LF		
12	Combination Curb & Gutter, CG-6	ATTD	12,600	LF		
13	Concrete Sidewalk, 4” Thick	ATTD	5,600	SY		
14	Concrete Entrance, CG-9D	ATTD	500	SY		
15	Concrete Manhole Collars	ATTD	63	EA		
16	CG-12 Detectable Warning Surface	ATTD	50	SY		
17	Asphalt Concrete, Type SM-9.5D	VDOT 315	8,600	TON		
18	Asphalt Concrete, Type IM-19.0D	VDOT 315	450	TON		
19	Flexible Pavement Planing (0-2”)	VDOT 515	53,000	SY		
20	Asphalt Concrete, Type BM-25.0A	VDOT 315	750	TON		
21	Aggregate Base Material, Type I, No 21B	VDOT 308	1,500	TON		
22	Segmental Block Retaining Wall, Precast	ATTD	950	SF		
23	Mailbox	VDOT 521	12	EA		

Storm Drainage						
24	Storm Sewer Pipe, 12” RCP	ATTD	15	LF		
25	Storm Sewer Pipe, 15” RCP	ATTD	2,710	LF		
26	Storm Sewer Pipe, 18” RCP	ATTD	900	LF		
27	Storm Sewer Pipe, 21” RCP	ATTD	625	LF		
28	Storm Sewer Pipe, 24” RCP	ATTD	1,400	LF		
29	Storm Sewer Pipe, 27” RCP	ATTD	325	LF		
30	Storm Sewer Pipe, 36” RCP	ATTD	180	LF		
31	Storm Sewer Pipe, 42” RCP	ATTD	2,315	LF		
32	Storm Structure V4-1, DI-3B, L=6’	ATTD	1	EA		
33	Storm Structure V4-2, DI-2B, L=4’	ATTD	1	EA		
34	Storm Structure V4-4, Precast Concrete Pipe Tee	PLAN, ATTD	1	EA		
35	Storm Structure V4-3, MH-1 or 2	ATTD	1	EA		
36	Storm Structure V4-10, Mod. Shallow MH	ATTD	1	EA		
37	Storm Structure V4-8, DI-2B, L=10’	ATTD	1	EA		
38	Storm Structure V4-9, Doghouse MH	ATTD	1	EA		
39	Storm Structure V4-6, MH-1 or 2	ATTD	1	EA		
40	Storm Structure V4-5, DI-2EE, L=6’	ATTD	1	EA		
41	Storm Structure V4-14, Modify Exist. MH, Adjust Top	ATTD	1	EA		
42	Storm Structure V4-7, Modify Exist. DI to MH, Adjust Top	ATTD	1	EA		
43	Storm Structure V4-11, Modify Exist. MH, Adjust Top	ATTD	1	EA		
44	Storm Structure V4-12, Modify Exist. MH, Adjust Top	ATTD	1	EA		
45	Storm Structure V4-13, Modify Exist. MH, Adjust Top	ATTD	1	EA		
46	Storm Structure V5-1, DI-3B, L=4’	ATTD	1	EA		

47	Storm Structure V5-2, Mod. DI-1 (Shallow) SD-5, 3 Grates	ATTD	1	EA		
48	Storm Structure V5-3, DI-2B, L=6’	ATTD	1	EA		
49	Storm Structure V5-4, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
50	Storm Structure V5-5, Modify Exist. DI to MH, Adjust Top	ATTD	1	EA		
51	Storm Structure V5-6, MH-2	ATTD	1	EA		
52	Storm Structure V5-7, Modify Exist. MH, Adjust Top	ATTD	1	EA		
53	Storm Structure V5-8, Modify Exist. MH, Adjust Top	ATTD	1	EA		
54	Storm Structure V5-9, Modify Exist. DI, Adjust Top	ATTD	1	EA		
55	Storm Structure V5-10, Modify Exist. DI, Adjust Top	ATTD	1	EA		
56	Storm Structure V6-1, DI-3B, L=6’	ATTD	1	EA		
57	Storm Structure V6-2, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
58	Storm Structure V6-3, DI-4B, L=12’	ATTD	1	EA		
59	Storm Structure V6-4, DI-2B, L=8’	ATTD	1	EA		
60	Storm Structure V7-1, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
61	Storm Structure V7-2, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
62	Storm Structure V7-3, Mod. Shallow MH	ATTD	1	EA		
63	Storm Structure V7-14, Mod. DI-1 (Shallow) SD-5, 3 Grates	ATTD	1	EA		
64	Storm Structure V7-16, Mod. Shallow MH	ATTD	1	EA		
65	Storm Structure V7-4, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
66	Storm Structure V7-5, Mod. DI-1, (Shallow) SD-5, 3 Grates	ATTD	1	EA		
67	Storm Structure V7-6, DI-2BB, L=4’	ATTD	1	EA		
68	Storm Structure V7-7, DI-2B, L=4’	ATTD	1	EA		
69	Storm Structure V7-8, Modify Exist. JB-1, Solid Slab Unit	ATTD	1	EA		

70	Storm Structure V7-9, MH-1 or 2	ATTD	1	EA		
71	Storm Structure V7-13, 12” End Wall (EW-1)	ATTD	1	EA		
72	Storm Structure V7-10, DI-2B, L=4’	ATTD	1	EA		
73	Storm Structure V7-11, Mod. DI-1 (Shallow) SD-5, 4 Grates	ATTD	1	EA		
74	Storm Structure V7-12, Modify Exist. MH, Adjust Top	ATTD	1	EA		
75	Storm Structure V7-15, Modify Exist. MH	ATTD	1	EA		
76	Storm Structure V8-2, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
77	Storm Structure V8-3, DI-2BB, L=8’	ATTD	1	EA		
78	Storm Structure V8-5, DI-2BB, L=12’	ATTD	1	EA		
79	Storm Structure V8-6, MH-1 or 2	ATTD	1	EA		
80	Storm Structure V8-8, DI-3B, L=10’	ATTD	1	EA		
81	Storm Structure V8-9, Doghouse MH	ATTD	1	EA		
82	Storm Structure V8-10, DI-2BB, L=12’	ATTD	1	EA		
83	Storm Structure V8-11, DI-2BB, L=4’	ATTD	1	EA		
84	Storm Structure V8-12, DI-2BB, L=4’	ATTD	1	EA		
85	Storm Structure V8-13, MH-1 or 2	ATTD	1	EA		
86	Storm Structure V8-14, MH-1 or 2	ATTD	1	EA		
87	Storm Structure V9-7, Modify Exist. DI to DI-3B, L=10’, Adjust Top	ATTD	1	EA		
88	Storm Structure V9-1, DI-2BB, L=10’	ATTD	1	EA		
89	Storm Structure V9-2, DI-2BB, L=6’	ATTD	1	EA		
90	Storm Structure V9-3, DI-2B, L=4’	ATTD	1	EA		
91	Storm Structure V9-5, Mod. Large Diameter MH, DI-1 Top	ATTD	1	EA		
92	Storm Structure V9-8, DI-1	ATTD	1	EA		

93	Storm Structure V9-4, Modify Exist. DI to DI-2B, L=18', Adjust Top	ATTD	1	EA		
94	Storm Structure V9-6, MH-1 or 2	ATTD	1	EA		
95	Storm Structure V9-9, Mod. Shallow Doghouse MH, DI-1 Top	ATTD	1	EA		
96	Storm Structure V10-2, DI-3BB, L=4'	ATTD	1	EA		
97	Storm Structure V10-3, Modify Exist. DI to DI-2B, L=4', Adjust Top	ATTD	1	EA		
98	Storm Structure V10-8, DI-1	ATTD	1	EA		
99	Storm Structure V10-9, DI-1	ATTD	1	EA		
100	Storm Structure V10-10, DI-2B, L=10'	ATTD	1	EA		
101	Storm Structure V10-11, DI-2B, L=8'	ATTD	1	EA		
102	Storm Structure V10-12, 7' MH-2	ATTD	1	EA		
103	Storm Structure V10-30, DI-2B, L=12'	ATTD	1	EA		
104	Storm Structure V10-13, 6' MH-2	ATTD	1	EA		
105	Storm Structure V10-14, DI-4BB, L=8'	ATTD	1	EA		
106	Storm Structure V10-15, DI-4CC, L=8'	ATTD	1	EA		
107	Storm Structure V10-17, 5' MH-2	ATTD	1	EA		
108	Storm Structure V10-16, Mod. Shallow MH, DI-1 Top	ATTD	1	EA		
109	Storm Structure V10-18, Modify Exist. MH, Adjust Top	ATTD	1	EA		
110	Storm Structure V10-5, DI-1	ATTD	1	EA		
111	Storm Structure V10-4, DI-1	ATTD	1	EA		
112	Storm Structure V10-28, DI-2B, L=4'	ATTD	1	EA		
113	Storm Structure V10-6, DI-3CC, L=12'	ATTD	1	EA		
114	Storm Structure V10-19, 7' MH-2	ATTD	1	EA		
115	Storm Structure V10-20, 7' MH-2	ATTD	1	EA		

116	Storm Structure V10-21, 6’ MH-2	ATTD	1	EA		
117	Storm Structure V10-27, DI-3B, L=4’	ATTD	1	EA		
118	Storm Structure V10-22, Modify Exist. DI to MH, Adjust Top	ATTD	1	EA		
119	Storm Structure V10-29, DI-3B, L=12’	ATTD	1	EA		
120	Storm Structure V10-23, DI-3B, L=4’	ATTD	1	EA		
121	Storm Structure V10-26, DI-3C, L=6’	ATTD	1	EA		
122	Storm Structure V10-24, DI-2B, L=8’	ATTD	1	EA		
123	Storm Structure V10-25, DI-2B, L=6’	ATTD	1	EA		
124	Storm Structure V11-1, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
125	Storm Structure V11-2, Mod. DI-1 (Shallow) SD-5, 3 Grates	ATTD	1	EA		
126	Storm Structure V11-6, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
127	Storm Structure V11-4, DI-2B, L=4’	ATTD	1	EA		
128	Storm Structure V11-3, Modify Exist. MH, Adjust Top	ATTD	1	EA		
129	Storm Structure V11-5, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
130	Storm Structure V11-8, Mod. DI-1 (Shallow) SD-5, 2 Grates	ATTD	1	EA		
131	Storm Structure V11-7, 15” End Section (ES-1 or 2)	ATTD	1	EA		
132	Storm Structure V11-10, DI-3B, L=6’	ATTD	1	EA		
133	Storm Structure V11-11, Modify Exist. MH, Adjust Top	ATTD	1	EA		
134	Storm Structure V11-13, DI-2C, L=12’	ATTD	1	EA		
135	Storm Structure V11-9, MH-1	ATTD	1	EA		
136	Storm Structure V11-12, MH-1	ATTD	1	EA		
137	Storm Structure H3-6, Modify Exist. MH, Adjust Top, DI-2E, L=6’	ATTD	1	EA		

138	Storm Structure V12-1, Modify Exist. DI, Adjust Top	ATTD	1	EA		
139	Storm Structure V12-2, Mod. Shallow MH, DI-1 Top	ATTD	1	EA		
140	Storm Structure V12-14, Mod. Shallow MH	ATTD	1	EA		
141	Storm Structure V12-3, DI-2C, L=10’	ATTD	1	EA		
142	Storm Structure V12-5, DI-2B, L=4’, Doghouse MH	ATTD	1	EA		
143	Storm Structure V12-6, DI-2B, L=4’	ATTD	1	EA		
144	Storm Structure V12-7, DI-2C, L=6’	ATTD	1	EA		
145	Storm Structure V12-8, DI-3CC, L=6’	ATTD	1	EA		
146	Storm Structure V12-9, DI-1	ATTD	1	EA		
147	Storm Structure V12-12, Mod. Shallow MH	ATTD	1	EA		
148	Storm Structure V12-11, DI-2B, L=10’	ATTD	1	EA		
149	Storm Structure V12-4, DI-2B, L=4’	ATTD	1	EA		
150	Storm Structure V12-13, DI-2B, L=4’	ATTD	1	EA		
151	Storm Structure V12-15, Doghouse MH	ATTD	1	EA		
152	Storm Structure V12-10, DI-2B, L=4’	ATTD	1	EA		
153	Storm Structure V13-2, Mod. DI-1 (Shallow) SD-5	ATTD	1	EA		
154	Storm Structure V14-1, DI-3BB, L=4’	ATTD	1	EA		
155	Storm Structure V14-2, DI-4BB, L=6’	ATTD	1	EA		
156	Storm Structure V14-3, DI-4EE, L=6’	ATTD	1	EA		
157	Storm Structure V14-4, DI-4EE, L=6’	ATTD	1	EA		
158	Storm Structure V14-5, 5’ MH-2	ATTD	1	EA		
159	Storm Structure V14-6, DI-4BB, L=6’	ATTD	1	EA		

160	Storm Structure V14-7, DI-3B, L=6’	ATTD	1	EA		
161	Storm Structure V15-1, DI-4BB, L=6’	ATTD	1	EA		
162	Storm Structure V15-2, DI-4E, L=6’	ATTD	1	EA		
163	Storm Structure V15-3, 5’ MH-2	ATTD	1	EA		
164	Storm Structure V15-4, DI-4E, L=6’	ATTD	1	EA		
165	Storm Structure V15-6, DI-3B, L=6’	ATTD	1	EA		
166	Storm Structure V15-7, DI-3B, L=6’	ATTD	1	EA		
167	Storm Structure V15-8, DI-3B, L=4’	ATTD	1	EA		
168	Storm Structure V15-5, DI-4BB, L=6’	ATTD	1	EA		
169	Storm Structure V15-9, DI-2B, L=6’	ATTD	1	EA		
170	Storm Structure V15-10, 5’ MH-2	ATTD	1	EA		
171	Storm Structure V16-1, DI-2EE, L=6’	ATTD	1	EA		
172	Storm Structure V16-2, DI-3B, L=6’	ATTD	1	EA		
173	Storm Sewer Manhole Frame and Cover	ATTD	30	EA		
Traffic Signal						
174	Sign Panel	VDOT 701	6	SF		
175	Pedestrian Actuation PA-2	VDOT 703	5	EA		
176	Pedestal Pole PF-2 12’	VDOT 700	3	EA		
177	Concrete Foundation PF-2	VDOT 700	3	EA		
178	DELETED					
179	Video Detection Camera Cable	ATTD	701	LF		
180	Video Detection Camera Y Cable (BNS to 2 Wire)	ATTD	2	EA		
181	DELETED					

182	DELETED					
183	8/2 Conductor Cable (for lighting)	VDOT 700	245	LF		
184	14/2 Conductor Cable Shielded	VDOT 700	621	LF		
185	14/4 Conductor Cable	VDOT 700	621	LF		
186	14/4 Conductor Cable (for EVP Light)	VDOT 700	351	LF		
187	14/7 Conductor Cable	VDOT 700	1,052	LF		
188	Hanger Assembly SMB-3, One Way	VDOT 703	5	EA		
189	Remove Existing Pole (Pedestal Pole)	VDOT 703	2	EA		
190	Remove Existing Foundation (Pedestal Foundation)	VDOT 703	2	EA		
191	Remove Existing Signal Head (Ped & Signal)	VDOT 703	1	EA		
192	Remove Existing Manhole/Junction Box	VDOT 703	2	EA		
193	Install Sign	VDOT 501	6	EA		
194	Antenna Cable	ATTD	150	LF		
195	NS Signalization Test Pit (Ex. Utility Location for Conduits)	VDOT 700 & ATTD	10	EA		
196	Pedestrian Signal Head SP-8	VDOT 703	5	EA		
197	Junction Box JB-S2	VDOT 700	3	EA		
198	1-1/2” Metal Conduit	VDOT 700	14	LF		
199	2” PVC Conduit	VDOT 700	28	LF		
200	3” PVC Conduit	VDOT 700	26	LF		
201	4” PVC Conduit	VDOT 700	20	LF		
202	Bored 3” Conduit	VDOT 700	302	LF		
203	Trench Excavation ECI-1	VDOT 700	88	LF		
204	DELETED					
205	EVP Detector Cable	VDOT 703	351	LF		
206	NS Modify Existing Controller	PLAN	1	LS		

207	Rock Excavation for Signal	ATTD	10	CY		
208	Relocate Existing Signal Head	VDOT 703	6	EA		
209	Video Detection Camera	VDOT 703	4	EA		
Restoration and Landscaping						
210	Topsoil and Seeding	ATTD	7,800	SY		
Signs and Pavement Markings						
211	NS Rest Existing Sign(s) and Post (with new anchor base)	VDOT 510 , PLAN & ATTD	33	EA		
212	Steel Sign Supports	ATTD	33	EA		
213	Sign Anchor Bases	ATTD	149	LF		
214	NS Remove – Disposed Sign(s), Sign Post and Foundation	ATTD	7	EA		
215	Type B, Class 1 Pavement Line Marking, 4”	VDOT 704	33,100	LF		
216	Type B, Class 1 Pavement Line Marking, 6”	VDOT 704	1,100	LF		
217	Type B, Class 1 Pavement Line Marking, 24”	VDOT 704	430	LF		
218	Pavement Symbol Marking (Single Turn Arrow), Type B, Class 1	VDOT 704	22	EA		
219	Pavement Symbol Marking (Cyclist Thru Arrow), Type B, Class 1	VDOT 704	32	EA		
220	Pavement Symbol Marking (Helmeted Cyclist), Type B, Class 1	VDOT 704	32	EA		
Water and Sanitary Sewer						
221	Water Main Installation, 8” Ductile Iron	ATTD	450	LF		
221A	Water Main Installation, 6” Ductile Iron	ATTD	160	LF		
221B	Water Main Installation, 4” Ductile Iron	ATTD	20	LF		
222	Water Main Installation, 10” Ductile Iron	ATTD	1500	LF		
222A	Water Main Installation, 12” Ductile Iron	ATTD	80	LF		

222B	Water Main Installation, 14” Ductile Iron	ATTD	60	LF		
223	Gate Valve & Box, 6”	ATTD	7	EA		
224	Gate Valve & Box, 8”	ATTD	6	EA		
225	Gate Valve & Box, 10”	ATTD	7	EA		
225A	Gate Valve & Box, 12”	ATTD	1	EA		
225B	Ball Valve, 2”	ATTD	2	EA		
226	DELETED					
227	Wet Tap, 1-inch	ATTD	35	EA		
228	Wet Tap, 2-inch	ATTD	3	EA		
229	Wet Tap, 8-inch	ATTD	4	EA		
230	Water Service Line, ¾” Copper	ATTD	120	LF		
231	Water Service Line, 1” Copper	ATTD	1,400	LF		
232	Water Service Line, 2” Poly	ATTD	400	LF		
233	Water Meter Assembly Relocation, ¾”	ATTD	1	EA		
234	Water Meter Assembly, 1”	ATTD	8	EA		
235	Water Meter Assembly, 2”	ATTD	4	EA		
235A	Water Meter Assembly, 4”	ATTD	1	EA		
236	Fire Hydrant Assembly	ATTD	5	EA		
236A	Relocations of Existing Fire Hydrant	ATTD	3	EA		
236B	Termination of Existing Line, ¾”	ATTD	38	EA		
236C	Termination of Existing Line, 1”	ATTD	4	EA		
236D	Termination of Existing Line, 4”	ATTD	1	EA		
237	Replace Existing Sanitary Sewer Manhole	ATTD	12	EA		
238	Sanitary Sewer Manhole Frame & Cover	ATTD	13	EA		
239	Modify Existing Sanitary Sewer Manhole	ATTD	1	EA		

239A	Sanitary Sewer Main, 8” SDR 26 PVC	ATTD	1200	LF		
239B	Sanitary Sewer Spot Repair #1	ATTD	1	Lump Sum		
Miscellaneous						
240	As-Built Drawings	ATTD	1	LS		
TOTAL FOR ALL – BASE BID						

TOTAL BASE BID: $_____

IN WORDS:

_____

CONTRACTOR: _____

BY: (SIGNATURE) _____

NAME AND TITLE: _____

_____

DATE: _____

ADDRESS: _____

_____

_____

TELEPHONE: _____

NOTE: REQUIRED BID GUARANTEE MUST BE ENCLOSED WITH THIS BID PROPOSAL.

I. Description.

This work shall consist of furnishing and installing various potable water distribution system infrastructure components including, but not limited to: water mains, water services and meters, fire hydrants, valves, and fittings.

II. Materials.

A. Water Mains

1) Ductile iron pipe shall be used for water lines 4 inches and larger in diameter. The ductile iron pipe shall conform to the requirement of AWWA Standard C151. Pipe shall be Class 52 minimum with cement-mortar lining and a bituminous seal coating conforming to the requirements of AWWA C205.
2) Ductile iron pipe shall be zinc coated, conforming to AWWA C150 and C151 with the following minimum properties:
   i) Coating system shall conform to ISO 8179
   ii) Coated with a layer of arc-sprayed zinc – 200 g of zing shall be applied per m^2 of pipe surface area.
   iii) Asphaltic top-coat shall be applied. The mean dry thickness shall be greater than or equal to 3 mils. The local allowable thickness is 2 mils.
3) Ductile iron pipe shall be encased in polyethylene in accordance with AWWA C105. Bag shall be V-Bio polywrap flat tube linear low-density polyethylene film (minimum 8 mil) or approved equal.

B. Pipe Fittings

1) All pipe fittings shall be ductile iron conforming to AWWA C-110, C-111, C-153. Fittings shall be cement-mortar lined and with a bituminous seal coat and epoxy coating.
2) Fittings shall be short body standard with mechanical joints for buried installation and flanged for interior and exterior exposed installations.
3) All fittings shall have a pressure rating of 350 psi or greater.
4) Mechanical joint restraint for ductile iron fittings shall be incorporated in the design of the retainer gland. The gland shall include a restraining mechanism which, when activated, imparts multiple wedging action against the pipe which increases its resistance as pressure increases.
5) Glands shall be designed to allow flexibility of pipe joints after installation and backfill. Glands shall be manufactured of ductile iron, conforming to ASTM A536-80. Glands shall have U.L. listing through 24-inch in size and Factory Mutual approval through 12-inch.
6) Retainer glands shall be used on each side of fittings where the water main changes direction. Additional sets of retainer glands are required at pipe lengths above and below fittings as required.
7) Retainer glands shall be Megalug Series 1100, Uni-Flange Series 1400, or approved equal.
8) Thrust restraint on slip joint ductile iron pipe shall be American Ductile Iron Flex-Ring Joint Pipe or approved equal.
9) All accessories shall be blue fluoropolymer coated.

C. Direct Bury Gate Valves

1) Gate valves 12 inches and smaller shall be of the tight-closing resilient seated gate valves, which meet or exceed the requirements for AWWA C-515.
2) All resilient seat valves are to be ductile iron body, internally reinforced molded natural rubber mounted, wedged disc, non-rising stem, tapered seat type.
3) Valves shall have a clear, unobstructed water way when fully opened and shall be at least as large as the pipe inside diameter for which it is intended.
4) Valves shall open counterclockwise and seating shall use compression closure.
5) Valve end connections shall be mechanical joint.
6) Top operating nut shall be 2-inch square operating nut.
7) The operating stem shall be a minimum diameter of 7/8-inch with a triple O-ring seal. The configuration of the O-rings shall be two above and one below the thrust collar.
8) Valves must have a 250 psi working pressure and 400 psi test pressure.
9) Valves installed with more than 5 feet of cover shall have extension rods added to bring the operating nuts to within 3 feet of the surface.
10) Manufacturer shall be Mueller Company (Model 2360), American Flow Control (Series 2500 Resilient Wedge Valve), Kennedy (Model #7571 D.B.) or approved equal.

D. Valve Box Assemblies

1) Valve boxes are to be installed on all valves within the water network. These boxes shall be two piece and screw type for adjustment to finish grade.
2) All valve boxes shall be installed upon the valve with the use of a Valve Box Adaptor II as manufactured by Adaptor, Inc. or approved equal. The adaptor shall be manufactured to fit the specified size and brand of both valve and valve box with which it is installed. The adaptor shall be made of a resilient rubber material. The adaptor shall be installed in lieu of hardwood blocking and shall be installed incidental to the valve and box installation.
3) Valve box shall be furnished with a 5-1/4-inch lid made of cast iron and marked "Water".
4) When valve may be subjected to traffic, the top of the valve box shall be flush with the final surface. An 18" x 18" concrete pad (6" thick) is required around valve boxes installed outside of pavement area.

E. Tapping Sleeves and Valves ("Wet Taps")

1) Tapping sleeves shall be ductile iron construction meeting ASTM Grade 65-45-12. Side flange seals shall be of the O-ring type. Sleeves shall be coated with asphaltic varnish in compliance with NSF-61.
2) Stainless steel tapping sleeves may be used on pipe sizes 6 inch through 30 inch and shall be Ford Style FAST or FTSS, or approved equal.
3) Tapping sleeves shall be American Flow Control Series 2800, or approved equal.
4) Valves shall be American Flow Control Series 2500 resilient wedge valve or approved equal.
5) Tapping valves shall be resilient seat type with bodies and bonnets made of ductile iron for 250 psi working pressure. Cutters used shall be at least 1/4-inch smaller than the valve size.

F. Fire Hydrants

1) Hydrants shall be dry barrel conforming to AWWA C502, and have a traffic breakaway flange and stem coupling.
2) Design of the hydrant shall be of the compression type main valve and O-ring seal between the operating nut and bonnet.
3) Traffic breakaway flange shall be installed 4 inches from the final grade.
4) Hydrant shall have a 6-inch inlet and a 4-1/2 inch valve opening. Outlets shall be one 4-1/2 inch streamer nozzle and two 2-1/2 inch hose nozzles. Outlet nozzles shall be field replaceable utilizing straight threads or quarter turn seal by an O-ring. Each nozzle cap shall be equipped with chain and gasket.
5) Hydrant shall open right (clockwise) utilizing a pentagon shaped nut 1-1/2 inch in size.
6) Install "out-of-service" signs on new fire hydrants until all testing is complete and the hydrants become active.
7) Fire hydrants to be used as air release shall:

    a) Provide positive slope upward from hydrant tee to fire hydrant base.
    b) Mechanical joint ductile iron pipe and fittings with retainer glands at each fitting required.

8) Hydrants shall be American Darling, Model MK-73-2, as manufactured by American Flow Control, Kennedy Valve Guardian K81D, or approved equal. Upper barrel, lower barrel and base must be ductile iron painted yellow. Base bolts and nuts must be stainless steel.
9) Hydrant shall have a solid base surrounding the barrel no less than 24 inches by 24 inches by 6 inches deep. The solid base shall include high density concrete. Tamped soil is not considered a solid base.

G. Water Services

1) 3/4-inch Water Service

a) Water services to be installed in accordance with the City of Winchester Standard Details.
b) Corporation stops shall conform to AWWA C800, minimum pressure rating of 250 psi, 3/4-inch ball style, as manufactured by Ford, Model FB1000 or approved equal. Connection at corporation stop shall be flared or compression.
c) Service line shall be 3/4-inch ID type "K" copper tubing and shall be one continuous piece from corporation stop to meter setting.
d) Meter setting shall consist of a meter yoke, inlet angle valve, and outlet double check valve. The meter setting shall have two independent vertical cartridge check valves and be in conformance with ASSE 1024. Meter setting shall include:
    - iron yoke bar (Ford model Y502)
    - iron yoke expansion connector (Ford Y502)
    - yoke angle dual check valve (Ford HHCA94-323TV)
    - yoke angle ball valve (Ford BA94-223W)

e) Meter box shall be 18 inches in diameter and 30 inches tall, high density polyethylene (HDPE), with an 18-inch diameter frame and 11-1/2 inch diameter hinged lid. Meter box shall have a 10,000 lb minimum crush rating and shall have a minimum wall thickness of ½ inch. Frame and lid shall be made of cast iron and shall be recessed to accommodate the Neptune Radio Read antennae. Frame and lid shall be A.Y McDonald model number 74M32ARG. Traffic rated lids are required in areas subject to traffic; frame and lids shall be A.Y. McDonald meter box cover 74H32ARG.

2) 1-inch and Dual ¾-inch Water Service

a) Water services to be installed in accordance with the City of Winchester Standard Details.
b) Corporation stops shall be 1-inch and shall conform to AWWA C800, as manufactured by Ford, Model FB1000 or approved equal.
c) Service line shall be 1-inch ID type "K" copper tubing and shall be one continuous piece from corporation stop to meter setting.
d) Meter box shall be 20-inch by 24-inch tapered “bullet box” and 30 inches tall, high density polyethylene (HDPE). The interior of the box shall be white for light reflection. Frame and lid shall be made of cast iron and shall be recessed to accommodate the Neptune Radio Read antennae. Frame and lid with centering prongs shall be A.Y. McDonald model number 74MRARG. Traffic rated lids are required in areas subject to traffic and shall be Ford meter box cover X32H.
e) 1-inch meter setting shall consist of a meter yoke, inlet angle valve, and outlet double check valve. The meter setting shall have two independent vertical cartridge check valves and be in conformance with ASSE 1024. Meter settings shall include:
   - Iron yoke bar (Ford model Y504)
   - Iron yoke expansion connection (Ford Y504)
   - Yoke angle dual check valve (For HHCA94-444TV)
   - Yoke angle ball valve (Ford BA94-334W)
f) Dual ¾-inch meter settings shall consist of two single meter settings connected by a U-branch (Ford U48-427.5).

1) 1-1/2 inch and 2-inch Water Services

a) Water services to be installed in accordance with the City of Winchester Standard Details.
b) Corporation stops shall be 2 inches in size and shall conform to AWWA C800, as manufactured by Ford, or approved equal.
c) Service line shall be 2-inch ID SDR 9 polyethylene line and shall be one continuous piece from corporation stop to curb stop. Tracer wire shall be wrapped around the polyethylene service line and shall be connected on each end to the corporation stop and the curb stop.
d) Meter shall be set in a custom meter setting consisting of flanged angle valve on the inlet and outlet. Include bypass with ball valve and locking cap.

e) Meter box shall be 4'-0" long x 4'-0" wide x 4'-0" deep as shown in Standard Detail WD-4.
f) Access door shall be H-20 rated as manufactured by Bilco Door Company, Type PCM-2, or Halliday Products Model H1R3030. Dimensions shall be 2'-6" x 2'-6".
g) Backflow device shall meet applicable plumbing codes and City of Winchester Ordinance. Device must be installed outside of meter box.

III. Procedures

A. Bedding and Backfill

1) Outside of Traffic Area (see Detail WS-1)

1) The water main pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance.
2) From 12 inches above the pipe to the final grade, excavated trench material containing stones no greater than 3 inches in diameter may be used as backfill material, unless otherwise specified.

2) Within Traffic Area (See Detail WS-2)

a) The water main pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance.
b) When pipe is constructed within the road, street, driveway or parking lot, granular backfill (VDOT Class 21A) is required for the full depth of backfill. Backfill shall be placed in 6-inch layers and compacted by tamping.
c) Granular backfill (VDOT Class 21A) is required for the full depth of backfill where the trench is outside of the pavement but the nearest trench wall is within 5 feet of the edge of pavement.
d) Pipe trenches shall be restored within 24 hours. When necessary, trenches may be restored temporarily with cold patch asphalt. When weather permits, temporary trenches must be restored permanently within 7 days.

B. Thrust Restraint

1) Both megalug mechanical joint restraints and/or megalug slip joint restraint harness <u>and</u> concrete thrust blocks are required in all locations for thrust restraint including:
   a) Bends (Inlet and Outlet)
   b) Tee – All Branches
   c) Offsets – Inlet and Outlet

d) Caps
e) Plugs
f) Dead Ends
g) Hydrant run-outs shall be restrained as dead ends

C. Depth

1) All lines shall be laid with a minimum cover of 36 inches from the top of pipe to finished ground surface grade. Water main cover shall not exceed 11 feet with City approval.

D. Separation of water mains and sewers (both sanitary and storm)

1) Parallel installation. Under normal conditions water mains shall be laid at least 10 feet horizontally from a sewer or sewer manhole. The distance shall be measured edge to edge.
2) Parallel installation. Under unusual conditions when local conditions prevent a horizontal separation of 10 feet, the water main may be laid closer to a sewer or sewer manhole provided that:

   a) The bottom of the water main shall be at least 18 inches above the top (crown) of the sewer.
   b) Where this vertical separation cannot be obtained, the sewer shall be constructed of Class 52, ductile iron water pipe, pressure tested in place without leakage prior to backfilling.
   c) The sewer manhole shall be of watertight construction and tested in place.

3) Crossing. Under normal conditions, water lines crossing sewers shall be laid to provide a separation of at least 18 inches between the bottom of the water line and the top of the sewer whenever possible.
4) Crossing. Under unusual conditions when local conditions prevent a vertical separation of 18 inches, the following construction shall be used:

   a) Sewers passing over or under water mains shall be constructed of Class 52, ductile iron sewer pipe according to the standards for ductile iron gravity mains.
   b) Water mains passing under sewers shall be protected by providing:

      (1) A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water main.
      (2) Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the water main. Support may be provided by a concrete cradle sized appropriately for the sizes of the mains and the surrounding soil conditions.
      (3) The length of the water main pipe section shall be centered at the point of crossing so that the joints shall be equidistant and as far as possible from the sewer.

5) No water main shall pass through or come in contact with any part of a sewer manhole.

E. Connections to Existing System

1) All connections to the existing system shall be made by a "wet tap" with a tapping sleeve/valve, as directed by the City.

F. Pressure and Leakage Test

1) General - Distribution Mains

   a) Testing shall be in accordance with the Virginia Department of Health and AWWA C600.
   b) Test pressure shall not exceed pipe or thrust-restraint design pressures.
   c) Test pressure shall not vary for the duration of the test.
   d) Test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.
   e) When hydrants are in the test section, the test shall be made against open hydrant valves.

2) Test Procedure - Distribution Mains

   a) After the pipe has been laid all pipe shall be subjected to a hydrostatic pressure of not less than 150 psi or 1.25 times the working pressure at the highest point along the test section.
   b) Each section of pipe to be tested shall be slowly filled with water.
   c) Expel all air from pipeline.
   d) Apply 100 percent of required test pressure at beginning of test. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
   e) Maintain test pressure for a minimum of 2 hours.
   f) There shall be zero leakage during the test period.
   g) If the leakage is greater or the pressure cannot be maintained, the contractor shall locate and make approved repairs as necessary until the leakage is within the specified tolerance.
   h) All visible leaks are to be repaired, regardless of the amount of leakage.

3) Test Procedure - Fire Lines

   a) Test procedure is the same as described above, except that the test pressure shall be 200 psi, duration of test is 1 hour. There shall be zero leakage during the 1-hour test period.

G. Disinfection

1) Disinfection shall be performed after the pressure testing has passed and approved by the City of Winchester.
2) All water mains shall be disinfected and bacteriological testing completed immediately prior to being placed in operation.
3) The basic disinfection procedure consists of:

   A. Preventing contamination materials from entering the water main during storage, construction or repair.
   B. Removing, by flushing or other means, those materials that may have entered the water main.
   C. Chlorinating any residual contamination that may remain, and flushing the chlorinated water from the main. A newly installed main shall be disinfected in accordance with AWWA C651, and the Virginia Department of Health regulations.
   D. Protecting the existing distribution system from backflow due to hydrostatic pressure test and disinfection procedures.
   E. Determining the bacteriological quality by laboratory test after disinfection.
   F. Final connection of the approved new main to the active distribution system.

4) Chlorination shall be by the tablet method, unless otherwise approved in writing by the City of Winchester. This method may be used only if the pipe and appurtenances are kept clean and dry during construction. Alternate disinfection procedures may be required at the option of the City of Winchester if the circumstances are such that the pipe and appurtenances are not kept clean and dry.

   During construction, 5-g calcium hypochlorite tablets shall be placed in each section of pipe. Also, one such tablet shall be placed in each hydrant, hydrant branch and other appurtenances. Table 1 shows the number of tablets required for commonly used sizes of pipe.

Table 1. Number of 5-g calcium hypochlorite tablets required for dose of 25 mg/l

Length of Pipe Section, ft					
Pipe Diameter (inches)	</= 13	18	20	30	40
	Number of 5-g calcium hypochlorite tablets				
4	1	1	1	1	1
6	1	1	1	2	2
8	1	2	2	3	4
10	2	3	3	4	5

12	3	4	4	6	7
16	4	6	7	10	13

Filling and contact. When installation has been completed, the main shall be filled with water at a rate such that water within the main will flow at a velocity no greater than 1 ft/s. Precautions shall be taken to ensure that air pockets are eliminated. This water shall remain in the pipe for at least 24 hours.

Final flushing: After the required retention period, the chlorinated water shall be flushed from the main using potable water. However, the chlorinated water shall not be flushed out until the residual is less than 1 mg/L. A reducing agent shall be applied as required to achieve this residual.

After final flushing and before the main is placed in service, two consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the main. At least one set of samples shall be collected from every 1,000 feet of the new main, plus one set from the end of the line and at least one set from each branch. Samples shall be collected in the presence of an inspector for the Department of Public Utilities in bottles provided by the City. Samples shall be tested for bacteriologic quality by the City of Winchester, and shall show the absence of coliform organisms. If contamination is indicated, then the disinfection/testing procedure must be repeated.

H. New Service Line Installations

1) Contractor shall coordinate and schedule with each individual customer any disruption in service necessary to place the new water service lines in operation.

I. Valve Insertions

1) As directed by the City, valves shall be inserted into existing water mains, as necessary, to minimize disruptions to existing customers during the project.

J. Bypass System

1) Contractor shall provide and operate a water service bypass system as shown on the contract drawings. Contractor shall be permitted to provide an alternate bypass plan for the City's consideration; any deviation from the City-provided plan shall be reviewed and approved by the City prior to bypass system installation.

IV. Measurement and Payment.

"Water Main Installation" will be measured in linear feet and will be paid for at the contract unit price per linear foot. Measurement shall be along the centerline of the pipe and fittings. This price shall include furnishing and installing: the pipe, all fittings, poly-wrap, mechanical restraints and concrete thrust blocks, excavation, removal and disposal of existing pipe, asphalt or concrete, bedding and backfill, base asphalt

in the trench, compaction, removal and disposal of excess material, sheeting and shoring, concrete encasement, testing, disinfecting, dewatering, and any other work necessary to provide a complete and working water system. The price shall also include establishing and maintaining a water main bypass system during installation and the removal and disposal of the existing water main.

"Gate Valve and Box" will be measured and paid for each valve installed in the water main and fire hydrant services. This price shall include furnishing and installing: all components shown on standard detail WD-8, including the valve, mechanical restraints and concrete thrust blocks, extension stem, valve box, concrete pad around the valve box (in unpaved areas), excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring.

"Wet Tap" will be measured and paid for each tapping sleeve and valve installed to connect to an existing water main. This price shall include furnishing and installing: the tapping sleeve and valve, mechanical restraints and concrete thrust blocks, valve box and extension stem, concrete pad around the valve box (in unpaved areas), excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring.

"Water Service Line" will be measured and paid per linear foot of service line installed. This price shall include furnishing and installing the service saddle and tapping the water main, corporation stop, quarter bend coupling, copper or PE service line, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring. **The existing water meter will be placed in the new meter assembly by the Contractor at the time of placing the new service line in operation.** Price shall also include existing site restoration, including asphalt repairs within the roadway, topsoil, seeding, etc.

"Water Meter Assembly" will be measured and paid for each meter assembly installed. This price shall include furnishing and installing: all components shown on standard details WD-1, WD-2, WD-3 or WD-4, including the meter setting, meter box/vault and lid/hatch, valves, backflow devices, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring. **The existing water meter will be placed in the new meter assembly by the Contractor at the time of placing the new service line in operation.** Price shall also include existing site restoration, including asphalt repairs within the roadway, topsoil, seeding, etc.

"Fire Hydrant Assembly" will be measured and paid for each fire hydrant installed. This price shall include furnishing and installing: all components shown on standard detail WD-7, including the fire hydrant, fittings, mechanical thrust restraint and concrete thrust blocks, tie road, concrete base, drainage fill, disinfection and testing, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, compaction, removal and disposal of excess materials, sheeting and shoring. The lateral piping required will be paid under "Ductile Iron Water Main" and the gate valve/box will be paid for under "Gate Valve and Box."

"Relocation of Existing Fire Hydrant" will be measured and paid for each fire hydrant relocated. This price shall include moving and re-installing: all components shown on standard detail WD-7, including the fire hydrant, fittings, mechanical thrust restraint and concrete thrust blocks, tie road, concrete base,

drainage fill, disinfection and testing, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, compaction, removal and disposal of excess materials, sheeting and shoring. The lateral piping required will be paid under "Ductile Iron Water Main" and the gate valve/box will be paid for under "Gate Valve and Box."

"Termination of Existing Line" will be measured and paid for each termination performed. This price shall include furnishing and installing: all components required for termination at the main, fittings, mechanical thrust restraint and concrete thrust blocks, tie road, concrete base, drainage fill, disinfection and testing, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, compaction, removal and disposal of excess materials, sheeting and shoring.

Payment will be made under:

Pay Item	**Pay Unit**
Water Main Installation, Size & Type	LF
Gate Valve and Box, Size	EA
Wet Tap, Size	EA
Water Service Line, Size & Type	LF
Water Meter Assembly, Size	EA
Fire Hydrant Assembly	EA
Relocation of Existing Fire Hydrant	EA
Termination of Existing Line, Size	EA

I. Description.

This work shall consist of furnishing and installing various sanitary sewer collection system infrastructure components including, but not limited to: sanitary sewer mains, manholes, laterals and cleanouts.

II. Materials.

a) Gravity Sanitary Sewer Mains

1) Sanitary sewers shall be polyvinylchloride (PVC) SDR 26 heavy wall sewer pipe and shall meet or exceed ASTM D-3034. Joints shall be gasketed, bell and spigot type with the bell made integral with the pipe.
2) Each length of pipe shall be marked with the manufacturer's name, trade name, nominal size, class, hydrostatic test pressure, manufacturer's standard symbol to signify it was tested, and date manufactured.
3) When connecting PVC main pipe to either clay or cast iron, Indiana Seal Shear Guards or approved equal are required.

b) Pipe Fittings

1) PVC fittings used in a gravity collection system shall be of the same SDR rating as the collection pipe being used.
2) Fittings are permitted only on service laterals and drop manholes in gravity collection system.

c) Manholes

1) Manholes shall be precast reinforced concrete capable of sustaining an H-20 loading and meeting standards put forth under ASTM C-478.
2) Manholes shall have a minimum inside diameter of 48 inches with a minimum wall thickness of five inches.
3) The base section shall be monolithic to a point 12 inches above the crown of the incoming pipe with a minimum base thickness of 8 inches. The base shall have a diameter 12 inches larger than the barrel of the manhole.
4) Pipe holes up to 12 inches in new manholes shall be properly located and cast in place with appropriate boot (Tylox by Hamilton-Kent or approved equal). After assembly, pipe to be grouted in place using non-shrinking grout inside the manhole. Pipe holes 15 inches and above are required to be cored.
5) New mains or six-inch laterals into existing manholes may be cored and shall be sealed using Kor-N-Seal or Lock-Joint with two stainless steel bands by Dukor Co., Milford, NH, to hold the pipe in position.
6) Cone sections shall be eccentric narrowing from 48 inches to 24 inches inside diameter.
7) Flat top sections shall be used in place of a cone section for manholes less than 5 feet deep. The 24-inch access hole shall be offset to allow easy access to steps and shall be reinforced to support H-20 loading.
8) The exterior of the manhole shall be covered with fibrous bitumastic coating.
9) Manhole steps conforming to the applicable provisions of ASTM Specifications C 478 such as aluminum 14967 as manufactured by Alcoa or plastic steps manufactured by MA Industries or equal, shall be factory built into precast sections. Step spacing and

alignment to be maintained uniform and vertical throughout the depth of the manhole.

10) Each manhole section shall have not more than two holes for the purpose of handling and laying. These holes shall be sealed with cement mortar.
11) Joints of the manhole sections shall be of the tongue and groove type; sections shall be joined using profile gaskets for single step joints such as Type 4G manufactured by Press-Seal Gasket Corp,. or equal. Gaskets shall conform to the physical property requirements of ASTM standard C 443 and C 361.
12) All joints, holes, etc., shall be sealed with cement mortar.
13) Drop connections shall be used in the following cases:
    1) For pipes with diameters between 8” and 12”, an inside drop connection shall be used when the distance between the invert in and invert out is greater than 3’-1”. If the distance between the invert in and invert out is less than 3’ – 1”, the incoming line shall be lowered such that the invert in is no greater than 2’ above the invert out.
    2) For pipe with diameters 15” and greater, an outside drop connection shall be used when the distance between the invert in and invert out is greater than 6’-0”. If the distance between the invert in and invert out is less than 6’-0”, the incoming line shall be lowered such that the invert in is no greater than 2’ above the invert out.

d) Manhole Frame & Cover

1) Manhole frames and covers shall conform to ASTM A-48. The words "sanitary sewer" and the City Logo shall be cast into the cover and shall be plainly visible, per standard detail SS-6.
2) Manhole frames and covers shall be as manufactured by Neenah Foundry catalog #R-1643, component #N 1371-0061 (frame), and #N 1371-0062 (lid), or approved equal.

e) Lateral Piping

1) PVC pipe used for installation of lateral services shall be 4-inch unless otherwise specified and have a minimum wall thickness of SDR 26. All fittings shall be gasketed.
2) D.W.V. fittings shall comply with ASTM D-2665, and be socket by socket. Gasketed adapter shall meet ASTM D-3139 with gaskets meeting ASTM F-477.
3) 4-inch main line and lateral cleanout wyes shall be gasket by gasket by gasket on stand pipe lead.
4) Cleanouts for 4-inch and 6-inch laterals, located in grass areas, shall be cast iron gasketed cleanouts with a recessed brass screw plug, Panella model PA4SV-CSK.
5) Cleanouts subject to traffic or in the sidewalk area shall have a cleanout frame and cover over a PVC cleanout top. Cleanout frames and cover shall be Capitol Foundry model B-1140 or approved equal.
6) Lateral connections to an existing sewer shall be made with a boot-n-saddle with stainless steel straps and appropriate rubber fitting or by cut-in wye, using an 8x6 inch PVC tee wye, then reduced to 4” PVC.
7) Tracer wire shall be provided on all sanitary laterals within 6 feet of the surface.
8) When connecting PVC laterals pipe to existing clay or cast iron pipe, Indiana Seal Shear Guards or approved equal are required.

III. Procedures

A. Bedding and Backfill

1) Outside of Traffic Area (see Detail WS-1)

a) The sewer main pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance.
b) From 12 inches above the pipe to the final grade, excavated trench material containing stones no greater than 3 inches in diameter may be used as backfill material, unless otherwise specified.

2) Within Traffic Area (See Detail WS-2)

a) The sewer main pipe, fittings and appurtenances shall be bedded by hand, or approved mechanical method, from 6 inches below the pipe to 12 inches above the pipe with crushed stone classified as VDOT No. 57. Bedding material shall be deposited in the trench for its full width of each side of the pipe, fitting or appurtenance.
b) When pipe is constructed within the road, street, driveway or parking lot, granular backfill (VDOT Class 21A) is required for the full depth of backfill. Backfill shall be placed in 6-inch layers and compacted by tamping.
c) Granular backfill (VDOT Class 21A) is required for the full depth of backfill where the trench is outside of the pavement but the nearest trench wall is within 5 feet of the edge of pavement.
d) Pipe trenches shall be restored within 24 hours. When necessary, trenches may be restored temporarily with cold patch asphalt. When weather permits, temporary trenches must be restored permanently within 7 days.

B. Depth

1) All sanitary sewer mains shall be laid with a minimum cover of 36 inches from the top of pipe to finished ground surface grade.

C. Separation of water mains and sewers (both sanitary and storm)

1) Parallel installation

a) Under normal conditions water mains shall be laid at least 10 feet horizontally from a sewer or sewer manhole. The distance shall be measured edge to edge.
b) Under unusual conditions when local conditions prevent a horizontal separation of 10 feet, the water main may be laid closer to a sewer or sewer manhole provided that:

i. The bottom of the water main shall be at least 18 inches above the top (crown) of the sewer.
ii. Where this vertical separation cannot be obtained, the sewer shall be constructed of Class 52, ductile iron water pipe, pressure tested in place without leakage prior to backfilling.
iii. The sewer manhole shall be of watertight construction and tested in place.

c) Where the sanitary sewer is installed parallel to a storm drainage structure, there shall be at least 10 feet horizontally, measured center to center, between them.

2) Crossing

a) Under normal conditions, water lines crossing sewers shall be laid to provide a separation of at least 18 inches between the bottom of the water line and the top of the sewer whenever possible.
b) Under unusual conditions when local conditions prevent a vertical separation of 18 inches, the following construction shall be used:

i. Sewers passing over or under water mains shall be constructed of Class 52, ductile iron sewer pipe according to the standards for ductile iron gravity mains.
ii. Adequate structural support shall be provided to the mains to prevent excessive deflection and settling. Support may be provided by a concrete cradle sized appropriately for the sizes of main and the surrounding soil conditions.
iii. A full length of the water main pipe section shall be centered at the point of crossing so that the joints shall be equidistant and as far as possible from the sewer.

c) When it is necessary for sanitary sewer mains to cross above water mains, the water main shall be protected by providing:
i. A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water main.
ii. A full length of the sanitary main pipe section shall be centered at the point of crossing so that the joints shall be equidistant and as far as possible from the water main.

d) All crossings should be as close to 90 degrees as possible.
e) No water main shall pass through or come in contact with any part of a sewer manhole.

D. Inspections and Testing

1) General

a) All costs of cleaning, inspection and testing are to be borne by the Contractor and/or Developer.
b) Cleaning, televising and testing shall be performed a minimum of 30 days after the completion of backfill and compaction, and shall be witnessed by the City. The Contractor or Developer shall contact the City at the start of the waiting period.
c) Any portion of the sanitary sewer system failing to meet the inspection or testing requirements of the City of Winchester shall be corrected to the satisfaction of the City. The costs for such corrections shall be borne by the Contractor and/or Developer.
d) All repair methods, other than replacement of the defective areas with new materials, shall be subjected to prior approval of the City. Grouted, collared, clamped, or otherwise patched sewer pipe shall not be acceptable.
e) All unacceptable conditions found during television inspection must be corrected and re-televised.

2) Test Procedure – Gravity Sewer Mains

a) The completed sanitary sewer shall be high-pressure water jet cleaned and subjected to a low-pressure air test, in accordance with the following procedures:

1) All service laterals, cleanouts, stubs and fittings within the sewer test section shall be properly capped or plugged during construction to prevent air loss that could cause an erroneous air test result.
2) Plugs shall be supplied and installed by the Contractor in the line to be tested at each manhole. Each plug shall be securely placed.
3) Low pressure air shall be slowly introduced into the sealed line until a constant internal pressure of 4.0 psi is maintained.
4) After a constant pressure of 4.0 psi is reached, the air supply shall be throttled back to maintain that internal pressure for at least two minutes.
5) After the stabilization period, the air hose from the control panel to the air supply shall be shut off or disconnected, and the test shall begin.
6) For a section of the line to pass, there shall be zero leakage for a five-minute interval after the supply has been shut off.

b) The entire length of all flexible sewers shall be tested for deflection using a “go-no-go” mandrell (95% of the pipe’s internal diameter).
c) Sewer line sections shall be visually inspected by means of a closed circuit television. The inspection shall be done one manhole section at a time and recorded on a DVD or flash drive. Sewers are to be flow tested before television inspection to ensure no ponding occurs.

1) The television camera used for the inspection shall be one specifically designed and constructed for such inspection. The image shall be clear enough to enable the City representative and others viewing the monitor to easily evaluate the interior condition of the pipe. The inspection shall be recorded on a DVD or flash drive and the City shall retain a copy of the recording.

2) The visual inspection may be provided by an approved TV inspection firm or by the City. If the Developer should request this service from the City, he/she shall be charged per lineal foot inspected at the current rate.

3) Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall have a footage-recording device and the footage shall be displayed on the monitor.

4) Unacceptable conditions that adversely affect the ability of the system to function as designed or to be properly maintained may include, but are not limited to the following:

   a) Protruding taps.
   b) Root intrusion.
   c) Cracked or faulty pipe.
   d) Improper pipe repair.
   e) Misaligned or deformed pipe.
   f) Debris in line.
   g) Infiltration/exfiltration.
   h) Bellies or sags with a depth greater than or equal to 10% (or a maximum of 1-1/2 inches) of pipe diameter and/or a length greater than 25 feet.

3) Test Procedure - Manholes

   a) Precast concrete manholes shall be tested in accordance with ASTM C 1244-93, standard test method for concrete sewer manholes by the negative air pressure test (vacuum method).
   b) Manholes shall be tested after installation with all connections in place.
   c) Procedure for testing shall be as follows:

      1) Temporarily plug all pipes entering the manhole at least eight inches into the sewer pipe. The plug must be inflated at a location past the manhole/pipe gasket, and braced to prevent the plugs or pipes from being drawn into the manhole.
      2) The test head shall be placed inside the frame at the top of the manhole and inflated, in accordance with the manufacturer's recommendations.
      3) A vacuum of ten inches of mercury (10" Hg) shall be drawn on the manhole. Shut the valve on the vacuum line to the manhole and shut off the pump or disconnect the vacuum line from the pump.
      4) The pressure gauge shall be liquid filled, having a 3.5 inch diameter face with a reading from zero to 30 inches of mercury.
      5) The manhole is considered to pass the vacuum test if the time for the vacuum reading to drop from 10" to 9" Hg is one minute or more.
      6) If the manhole fails the test, necessary repairs shall be made. The vacuum test shall be repeated until the manhole passes the test.
      7) All temporary plugs and braces shall be removed after each test.

d) Manholes shall show no signs of ponding water in the inverts.

g) New Service Line Installations

1) Contractor shall coordinate and schedule with each individual customer any disruption in service necessary to place the new sanitary laterals in operation.

h) Inactive Sewer Laterals

1) All sewer laterals found to be inactive when excavated shall be sealed with concrete and backfilled. Concrete cap may be placed at the point of excavation as the lateral does not need to be terminated at the main.

IV. Measurement and Payment.

"Replace Existing Sanitary Sewer Manhole" will be measured and paid for each manhole replaced. This price shall include furnishing and installing: the manhole, up to 10 feet of PVC main stubbed from each invert and connected to the existing main, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring. The price shall also include any pumping and diversion of the existing sanitary flow necessary to complete the work and the removal and proper disposal of the complete existing manhole and up to 10 fee of the existing main replacement extending from the manhole.

"Sanitary Sewer Manhole Frame & Cover" will be measured and paid for each framed and cover installed. This price shall include furnishing and installing: the manhole frame & cover, excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring.

"Modify Existing Sanitary Sewer Manhole" will be measured and paid for each manhole modified. This price shall include excavation, modification of the manhole, removal and disposal of existing asphalt or concrete, bedding and backfill, base asphalt in the trench, compaction, removal and disposal of excess material, sheeting and shoring. The price shall also include any pumping and diversion of the existing sanitary flow necessary to complete the work and the removal and proper disposal of the complete existing manhole and up to 10 feet of the existing main replacement extending from the manhole.

"Sanitary Sewer Main (Type and Size)" will be measured in linear feet and will be paid for at the contract unit price per linear foot. Measurement shall be along the centerline of the pipe. This price shall include furnishing and installing: the pipe (SDR 26 PVC), excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, compaction, removal and disposal of excess material, sheeting and shoring, testing, connection of service laterals and any other work necessary to provide a complete and working sanitary sewer system.

"Sanitary Sewer Spot Repair" will be measured and paid for at the contract lump sum price. This price shall include furnishing and installing any necessary pipe (SDR 26 PVC), excavation, removal and disposal of existing asphalt or concrete, bedding and backfill, compaction, removal and disposal of

excess material, sheeting and shoring, testing, connection of service laterals and any other work necessary to provide a complete and working sanitary sewer system.

Payment will be made under:

Pay Item	**Pay Unit**
Replace Existing Sanitary Sewer Manhole	EA
Sanitary Sewer Manhole Frame & Cover	EA
Modify Existing Sanitary Sewer Manhole	EA
Sanitary Sewer Main (Type and Size)	LF
Sanitary Sewer Spot Repair	LS

Valley Ave - Existing Sanitary Sewer Information
(Surveyed October 2014)

A In Pl.SSMH
Top= 756.52
Inv.In= 745.57
Inv.Out= 745.50

B In Pl.SSMH
Top= 758.14
Inv.In= 746.29
Inv.Out= 746.22

C In Pl.SSMH
Top= 758.14
Inv.In= 746.45 (D)
Inv.In= 746.46 (I)
Inv.Out= 746.43

D In Pl.SSMH
Top= 761.51
Inv.In= 749.58 (E)
Inv.In= 749.59 (H)
Inv.Out= 749.51

E In Pl.SSMH
Top= 769.59
Inv.In= 760.84
Inv.Out= 756.70

F In Pl.SSMH
Top= 784.56
Inv.In= 775.86 (8")
Inv.In= 772.16 (8")
Inv.Out= 772.11

G In Pl.SSMH
Top= 762.11
Inv.In= 753.51 (4")
Inv.In= 753.51 (4")
Inv.Out= 753.41

H In Pl.SSMH
Top= 762.05
Inv.In= 752.25
Inv.Out= 752.15

I In Pl.SSMH
Top= 760.09
Inv.In= 748.59
Inv.Out= 748.56

J In Pl.SSMH
Top= 762.48
Inv.In= 757.04
Inv.Out= 752.35

K In Pl.SSMH
Top= 752.22
Inv.In= 746.20 (L)
Inv.In= 746.99 (8")
Inv.Out= 746.08

L In Pl.SSMH
Top= 759.89
Inv.In= 747.90 (T)
Inv.In= 747.70 (M)
Inv.Out= 747.69

M In Pl.SSMH
Top= 760.67
Inv.In= 748.29 (W)
Inv.In= 748.30 (N)
Inv.Out= 748.21

N In Pl.SSMH
Top= 760.59
Inv.In= 749.69 (O)
Inv.In= 752.71 (6")
Inv.Out= 749.65

O In Pl.SSMH
Top= 760.81
Inv.In= 752.02 (8")
Inv.In= 751.98 (P)
Inv.Out= 751.91

P In Pl.SSMH
Top= 764.60
Inv.In= 756.00 (RRR)
Inv.Out= 755.93

Q In Pl.SSMH
Top= 773.30
Inv.In= 759.76 (S)
Inv.In= 759.85 (R)
Inv.Out= 759.74

R In Pl.SSMH
Top= 780.40
Inv.In= 771.62 (8")
Inv.Out= 771.60

S In Pl.SSMH
Top= 771.69
Inv.In= 760.90 (8")
Inv.Out= 760.83

T In Pl.SSMH
Top= 758.96
Inv.In= 749.95
Inv.Out= 749.78

U In Pl.SSMH
Top= 757.50
Inv.In= 751.97
Inv.Out= 751.96

V In Pl.SSMH
Top= 757.62
Inv.Out= 753.10

W In Pl.SSMH
Top= 758.84
Inv.In= 751.52
Inv.Out= 751.46

X In Pl.SSMH
Top= 759.45
Inv.In= 751.93 (Y)
Inv.In= 752.37 (8")
Inv.Out= 751.87

Y In Pl.SSMH
Top= 757.23
Inv.In= 754.09 (Z)
Inv.In= 753.32 (10")
Inv.Out= 753.31

Z In Pl.SSMH
Top= 758.23
Inv.In= (Can't Open)
Inv.Out= (Can't Open)

2A In Pl.SSMH
Top= 762.05
Inv.In= 756.18
Inv.Out= 756.11

2B In Pl.SSMH
Top= 769.34
Inv.In= 765.64
Inv.Out= 765.54

2C In Pl.SSMH
Top= 766.85
Inv.In= 761.47 (2D)
Inv.In= 761.55 (8")
Inv.Out= 761.38

2D In Pl.SSMH
Top= 775.82
Inv.In= 763.70 (2E)
Inv.In= 769.68 (Lat ?)
Inv.Out= 763.56

2E In Pl.SSMH
Top= 775.64
Inv.In= 769.50 (8")
Inv.In= 769.53 (8")
Inv.Out= 769.41

2F In Pl.SSMH
Top= 765.16
Inv.In= 755.08 (2G)
Inv.In= 755.08 (8")
Inv.In= 755.14 (8")
Inv.Out= 755.07

2G In Pl.SSMH
Top= 774.53
Inv.In= 765.02
Inv.Out= 764.75

2H In Pl.SSMH
Top= 777.36
Inv.Out= 768.27

2I In Pl.SSMH
Top= 762.38
Inv.In= 753.19
Inv.Out= 753.05

2J In Pl.SSMH
Top= 765.89
Inv.In= 755.84
Inv.Out= 755.78

2K In Pl.SSMH
Top= 766.85
Inv.In= 757.80 (2L)
Inv.In= 758.10 (6")
Inv.Out= 757.78

2L In Pl.SSMH
Top= 773.96
Inv.In= 762.97
Inv.Out= 762.96

2M In Pl.SSMH
Top= 774.74
Inv.In= 764.16 (2N)
Inv.In= 764.05 (2Q)
Inv.Out= 764.00

2N In Pl.SSMH
Top= 777.64
Inv.In= 767.34
Inv.Out= 767.29

2O In Pl.SSMH
Top= 778.35
Inv.In= 770.06
Inv.Out= 770.04

2P In Pl.SSMH
Top= 775.71
Inv.Out= 772.39

2Q In Pl.SSMH
Top= 774.77
Inv.Out= 766.24

2R In Pl.SSMH
Top= 755.93
Inv.In= 750.40 (2S)
Inv.In= 750.26 (2U)
Inv.Out= 750.12

2S In Pl.SSMH
Top= 755.97
Inv.In= 751.83
Inv.Out= 751.71

2T In Pl.SSMH
Top= 759.23
Inv.Out= 753.10

2U In Pl.SSMH
Top= 757.57
Inv.In= 753.21 (4")
Inv.In= 751.91 (2V)
Inv.Out= 751.79

2V In Pl.SSMH
Top= 759.50
Inv.In= 755.12
Inv.Out= 752.08

2W In Pl.SSMH
Top= 766.51
Inv.In= 758.44
Inv.Out= 758.28

2X In Pl.SSMH
Top= 770.08
Inv.In= 760.01 (2Z)
Inv.In= 764.70 (2Y)
Inv.Out= 759.96

2Y In Pl.SSMH
Top= 773.93
Inv.In= 766.99 (8")
Inv.In= 767.06 (6")
Inv.Out= 766.97

2Z In Pl.SSMH
Top= 770.30
Inv.In= 760.27 (3A)
Inv.In= 760.16 (3B)
Inv.Out= 760.15

3A In Pl.SSMH
Top= 768.92
Inv.In= 762.85 (8")
Inv.In= 762.70 (8")
Inv.Out= 760.57

3B In Pl.SSMH
Top= 773.92
Inv.Out= 762.54

3C In Pl.SSMH
Top= 749.34
Inv.In= 740.58 (3U)
Inv.In= 738.64 (3D)
Inv.In= 738.49 (30)
Inv.Out= 738.44

3D In Pl.SSMH
Top= 751.67
Inv.In= 741.66
Inv.Out= 741.61

3E In Pl.SSMH
Top= 753.74
Inv.In= (Can't Open)
Inv.Out= (Can't Open)

3F In Pl.SSMH
Top= 756.05
Inv.In= 746.41
Inv.Out= 746.27

3G In Pl.SSMH
Top= 758.59
Inv.In= 749.96 (3H)
Inv.In= 750.22 (3K)
Inv.Out= 749.91

3H In Pl.SSMH
Top= 761.53
Inv.In= 753.85
Inv.Out= 753.80

3I In Pl.SSMH
Top= 766.14
Inv.In= 756.74
Inv.Out= 756.72

3J In Pl.SSMH
Top= 770.12
Inv.Out= 760.56

3K In Pl.SSMH
Top= 759.47
Inv.In= 750.93 (3L)
Inv.In= 750.79 (3N)
Inv.Out= 750.78

3L In Pl.SSMH
Top= 762.32
Inv.In= 752.00
Inv.Out= 751.98

3M In Pl.SSMH
Top= 764.27
Inv.In= 755.16 (8")
Inv.In= 755.09 (8")
Inv.Out= 754.99

3N In Pl.SSMH
Top= 762.22
Inv.In= 754.76 (8")
Inv.Out= 751.13

3O In Pl.SSMH
Top= 748.95
Inv.In= 739.09
Inv.Out= 739.05

3P In Pl.SSMH
Top= 750.27
Inv.In= 740.92 (6")
Inv.In= 740.35 (3Q)
Inv.Out= 740.34

3Q In Pl.SSMH
Top= 752.14
Inv.In= 741.55
Inv.Out= 741.53

3R In Pl.SSMH
Top= 754.11
Inv.In= 743.73 (3T)
Inv.In= 743.78 (3S)
Inv.Out= 743.72

3S In Pl.SSMH
Top= 757.93
Inv.Out= 747.94

3T In Pl.SSMH
Top= 756.47
Inv.In= 745.88 (Fr.6")
Inv.In= 745.91 (Fr.6")
Inv.Out= 745.79

3U In Pl.SSMH
Top= 751.18
Inv.In= 744.98
Inv.In= 742.11
Inv.Out= 741.08

3V In Pl.SSMH
Top= 743.51
Inv.In= 735.11 (3Y)
Inv.In= 734.96 (3W)
Inv.Out= 734.91

3W In Pl.SSMH
Top= 746.10
Inv.In= 735.46 (3X)
Inv.In= 735.46 (8")
Inv.Out= 735.45

3X In Pl.SSMH
Top= 747.90
Inv.In= 737.18
Inv.Out= 737.15

3Y In Pl.SSMH
Top= 743.14
Inv.In= 736.03
Inv.Out= 735.95

3Z Approx.Location
In Pl.SSMH
Top= 744.61
Inv.In= (Paved Shut)
Inv.Out= (Paved Shut)

4A In Pl.SSMH
Top= 743.83
Inv.In= 738.41
Inv.Out= 738.33

4B In Pl.SSMH
Top= 744.12
Inv.In= 738.94
Inv.Out= 738.74

4C In Pl.SSMH
Top= 746.36
Inv.In= 740.87 (4D)
Inv.In= 739.97 (Fr.?)
Inv.Out= 739.89

4D In Pl.SSMH
Top= 749.95
Inv.In= 742.86 (6" Lat.)
Inv.In= 742.85 (6" Lat.)
Inv.Out= 742.47

2/14/2020
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Plotted By: mbeales

PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomelli, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

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Rinker Design Associates, P.C.
Civil Engineering • Surveying • Environmental
Transportation • Land Development • Right of Way Services

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(3)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Utility Owners:

Water & Sewer:

City of Winchester
Contact: Drew Brady
Email: drew.brady@winchesterva.gov

Gas:

Washington Gas
350 Hillandale Lane
PO Box 24400
Winchester, VA 22604
Contact: David Flakenstein
Phone: (540) 868-7911
Email: df11748@washgas.com

Telecomm:

Verizon Virginia, Inc.
404 Hillandale Lane
Winchester, VA 22602
Contact: Michael Wallace
Phone: (540) 665-3153
Email: michael.e.wallace@verizon.com

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500 Shentel Way
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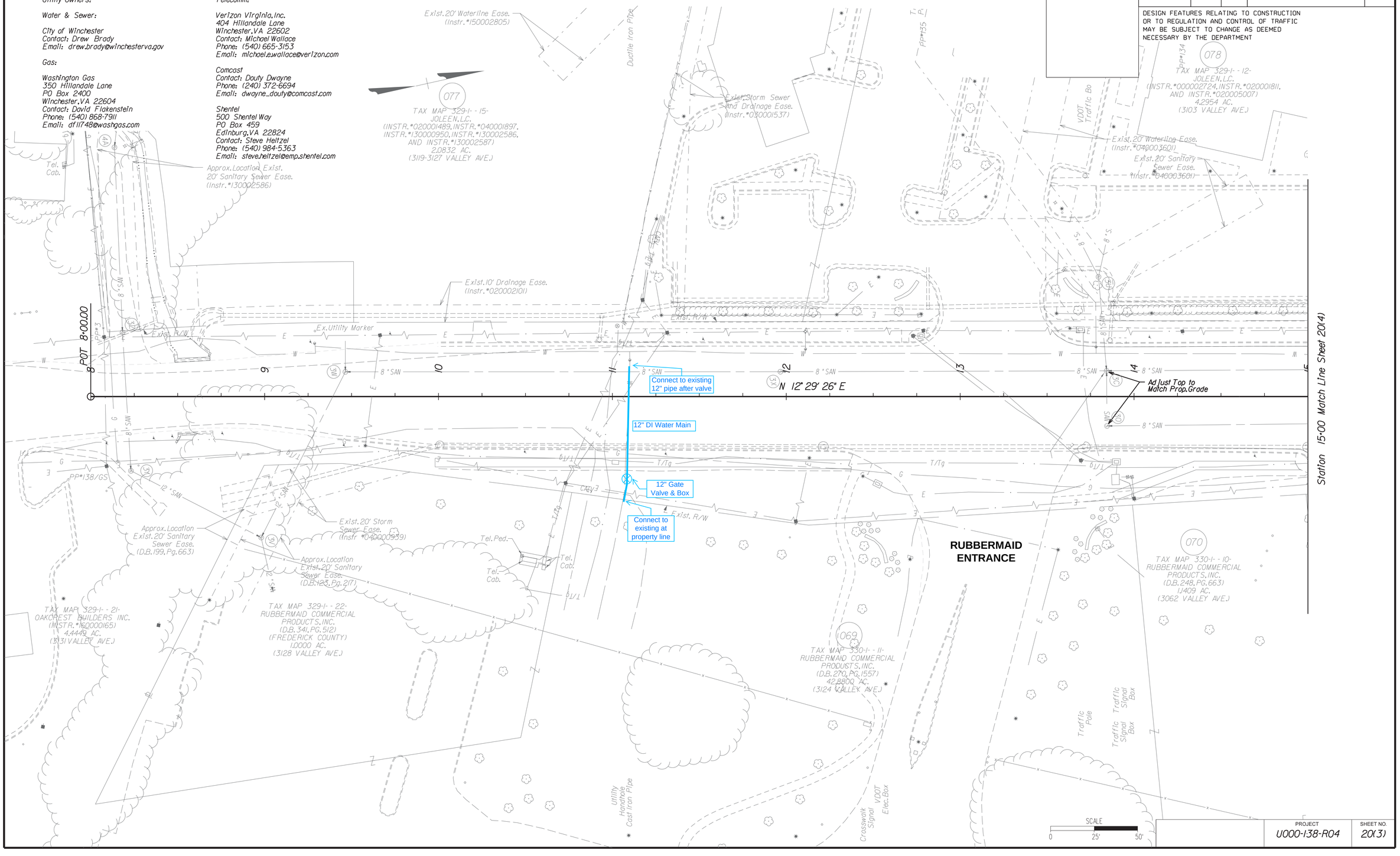
Contact: Steve Heltzel
Phone: (540) 984-5363
Email: steve.heltzel@emp.shentel.com



PROJECT	SHEET NO.
U000-138-R04	20(3)

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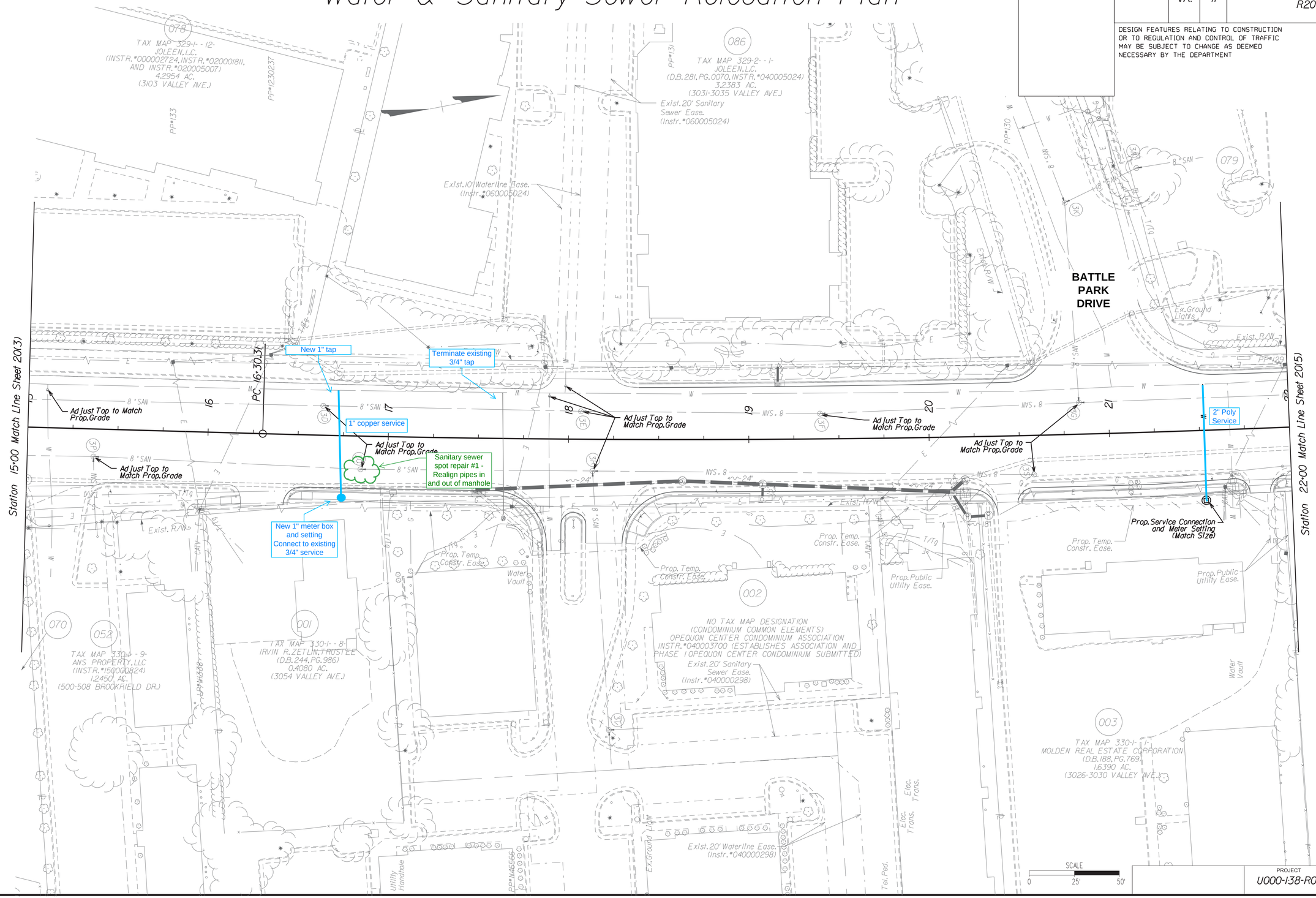
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates. (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201, C501	20(4)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(4)

Office Locations
Rinker Design Associates, P.C.
Civil Engineering - Surveying - Environmental
Transportation - Right of Way Services

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PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
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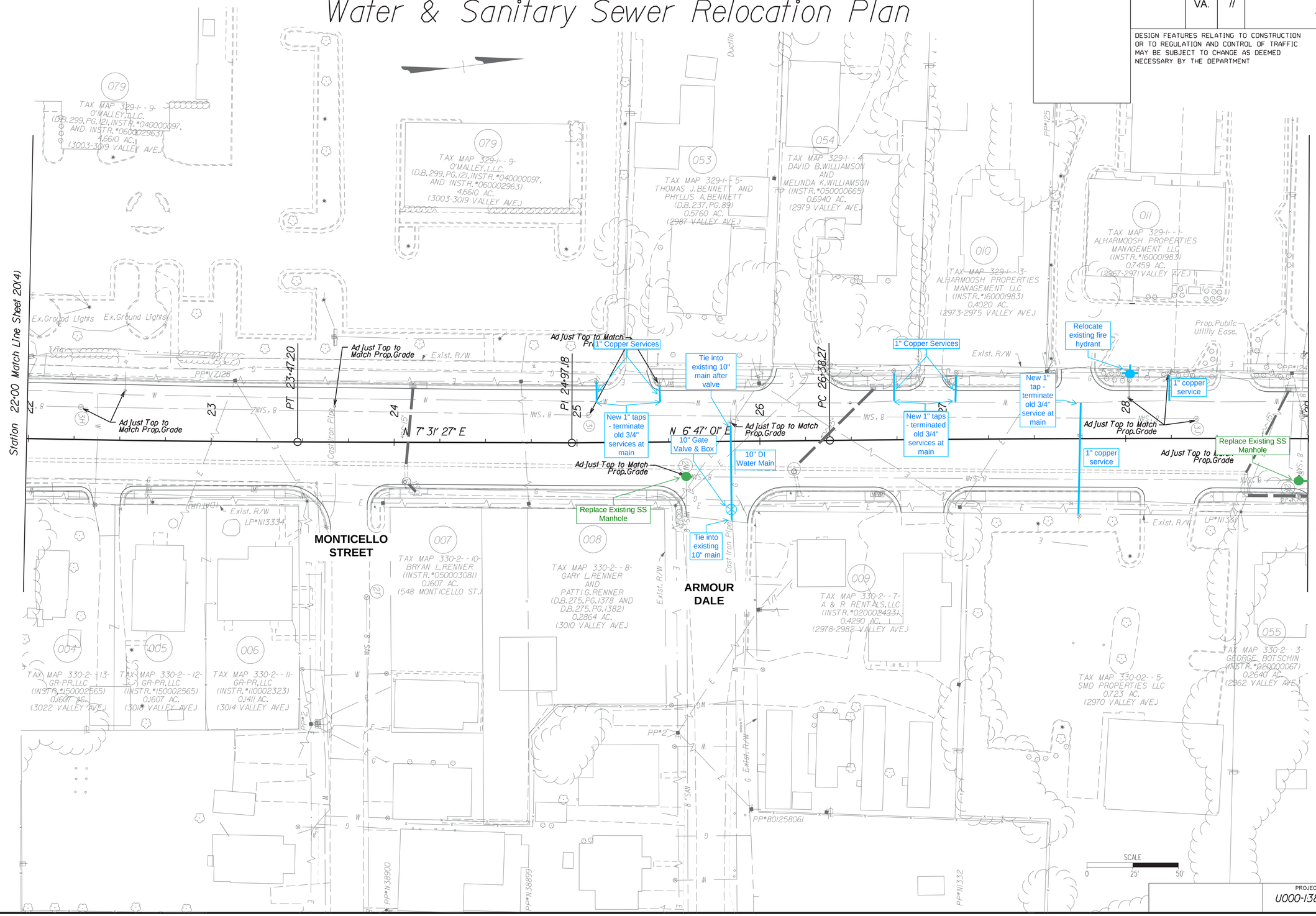
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201, C501	20(5)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(5)

Rinker Design Associates, P.C.
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Transportation - Planning - Right of Way Services
SHOTTON & WEBB, P.A.
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Front Royal, VA 22630 — 1401 Shenandoah Avenue, Suite 101, Tel: (540) 635-7138, Fax: (540) 635-7139

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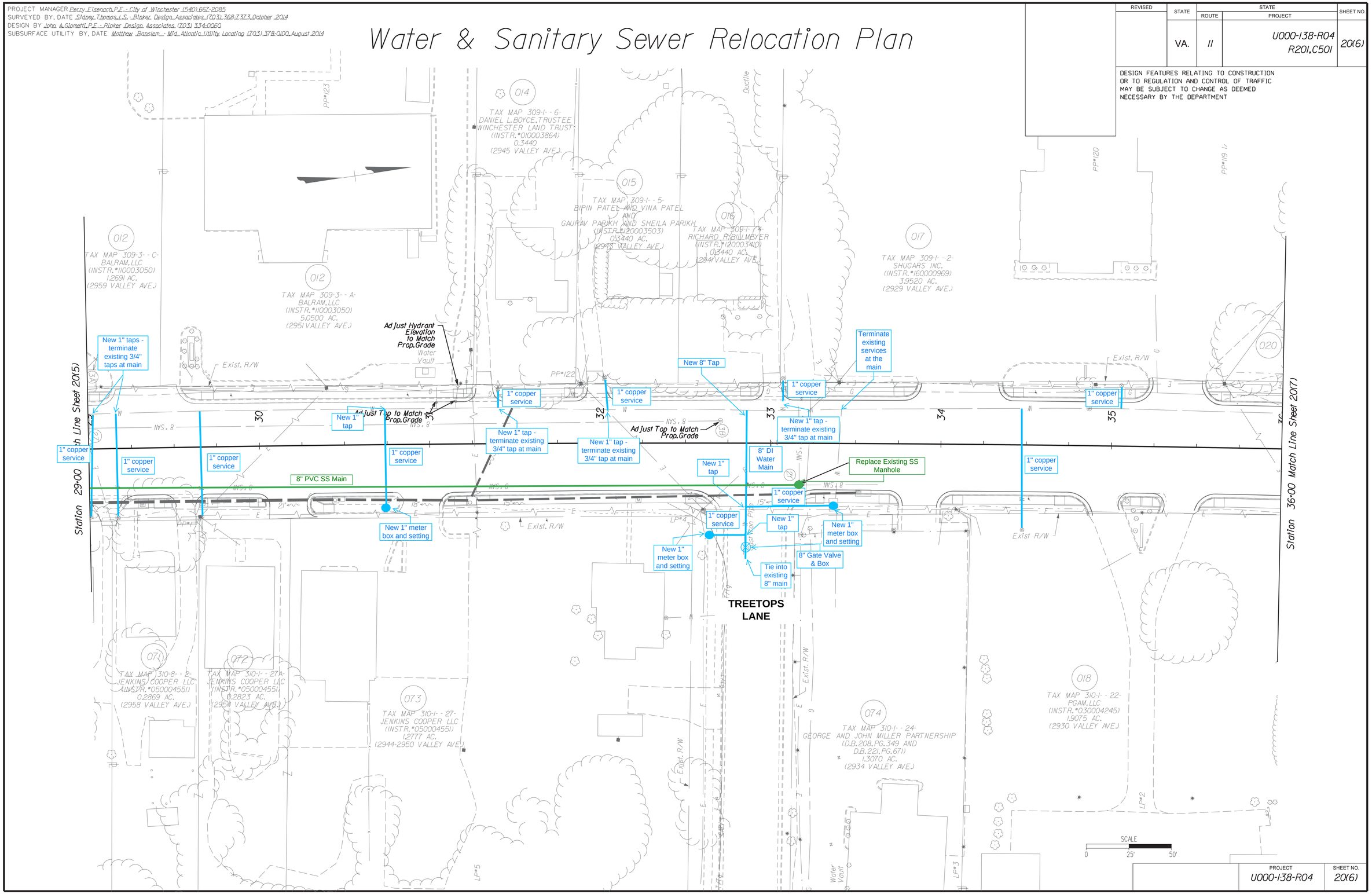
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(6)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(6)

Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning
Transportation • Environmental
Right of Way Services
Office Locations
Main Office
4651 Daniels Drive
Suite 100
Chantilly, VA 20151
Phone: (703) 378-0100
Fax: (703) 378-0101
Winchester Office
107 North Loudoun Street
Suite 100
Winchester, VA 22601
Phone: (540) 667-2085
Fax: (540) 667-2086

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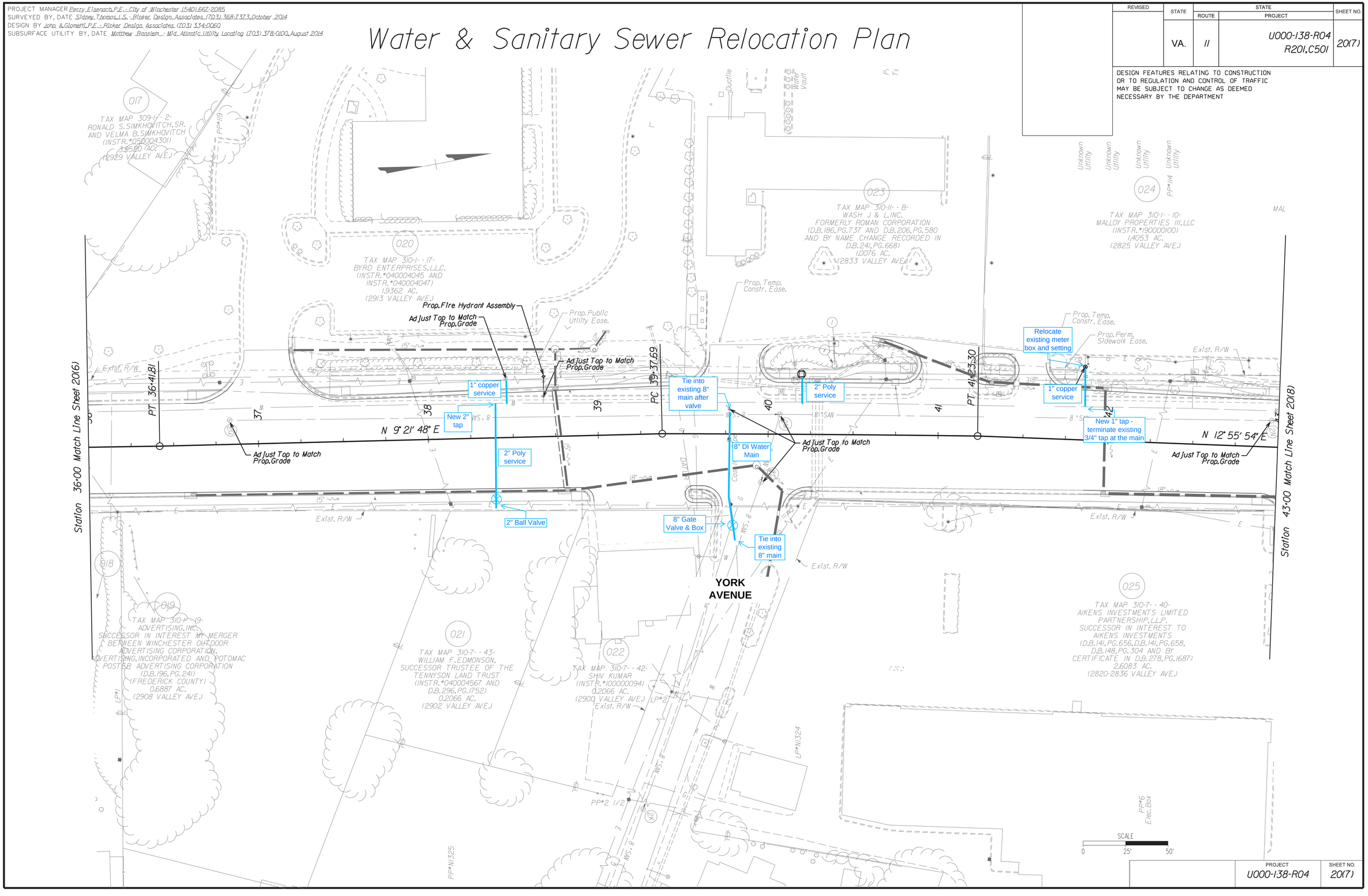
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomelli, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(7)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(7)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Transportation
Environmental - Emergency Mgmt. - Right of Way Services
Office Locations
Winchester, VA 22601 (540) 667-2085
Sterling, VA 20165 (703) 368-7373
Richmond, VA 23219 (804) 225-0330
Fax: (540) 665-0282
Fax: (703) 450-0060
Fax: (804) 225-0330
107 Mill Ridge Road, Suite 105, Lynchburg, VA 24502 (434) 239-0450 Fax: (434) 239-0459

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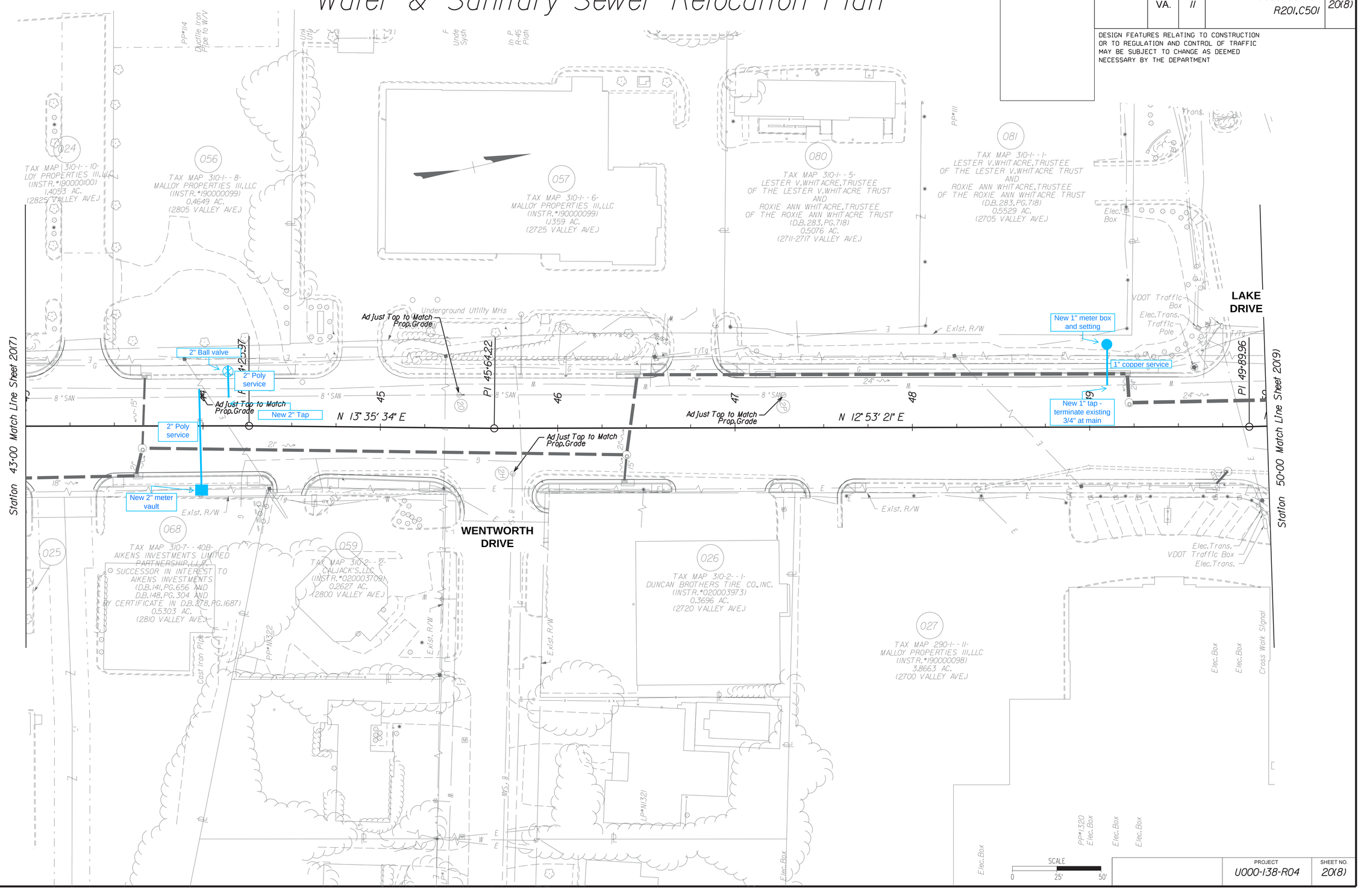
Plotted By: mbeales

PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates. (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(8)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(8)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Environmental
Transportation - Land Development - Right of Way Services
SHOPPING CENTERS
Office Locations
Corporate Headquarters: 8405 Greensboro Drive, Suite 800, McLean, VA 22102, Phone: (703) 556-9222, Fax: (703) 556-9291
Northern Virginia: 4417 Brookfield Corporate Drive, Suite 100, Chantilly, VA 20151, Phone: (703) 378-0100, Fax: (703) 378-0102
Richmond: 4914 Fitzhugh Avenue, Suite 100, Richmond, VA 23230, Phone: (804) 353-1999, Fax: (804) 353-0001
Fredericksburg: 2300 Dr. Gray's Hill Road, Suite 2-D, Fredericksburg, VA 22401, Phone: (540) 373-4030, Fax: (540) 373-4031

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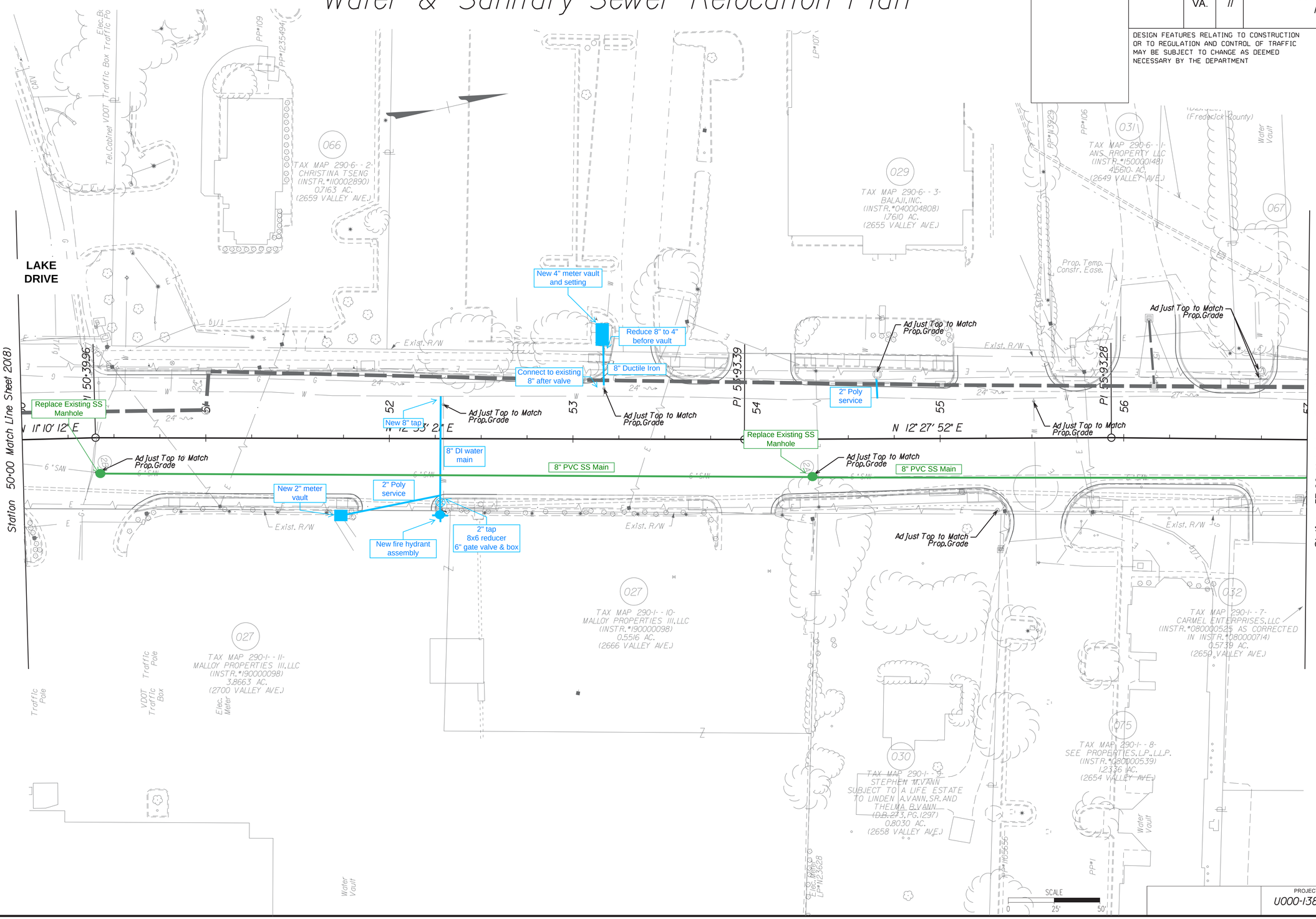
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(9)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(9)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Environmental
Transportation - Land Development - Right of Way Services
SHOOT DAY OR NIGHT 24 HOURS
Office Locations
Corporate Headquarters: 4101 Dickerson Road, Suite 100, Baltimore, MD 21202, Phone: (410) 685-3000, Fax: (410) 685-3000
Northern Virginia: 4101 Dickerson Road, Suite 100, Baltimore, MD 21202, Phone: (410) 685-3000, Fax: (410) 685-3000
Southern Virginia: 4101 Dickerson Road, Suite 100, Baltimore, MD 21202, Phone: (410) 685-3000, Fax: (410) 685-3000

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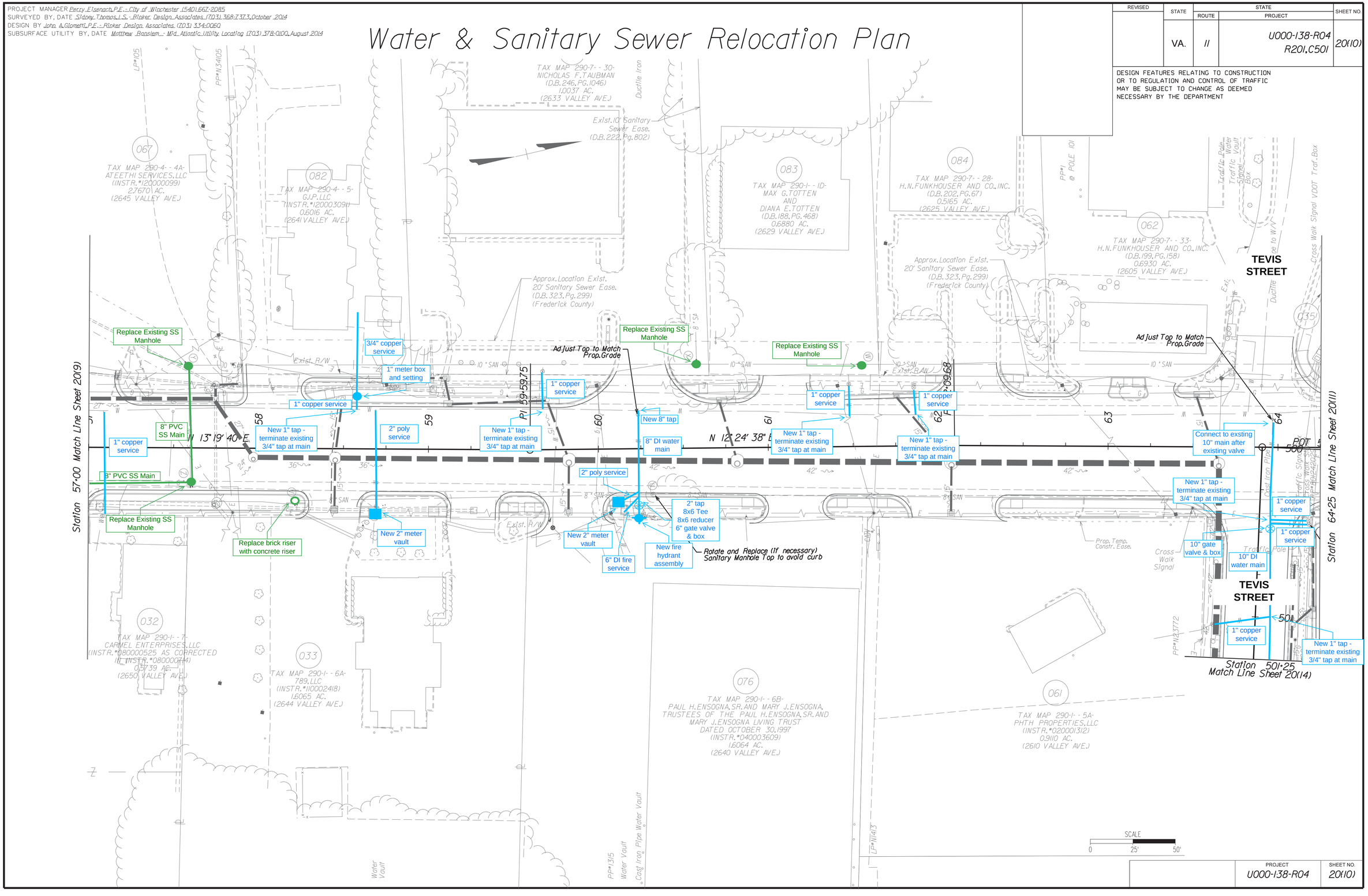
Plotted By: mbeales

PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540).667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates. (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(10)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(10)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Environmental
Transportation - Land Development - Right of Way Services
Office Locations
Winchester, VA 22601 — 107 Kent Street, Suite 100 — Phone: (540) 667-2085 — Fax: (540) 667-2086
Sterling, VA 20165 — 46101 Dulles Park Place, Suite 100 — Phone: (703) 450-4000 — Fax: (703) 450-4001
Fredericksburg, VA 22407 — 2000 Carl D. Silver Parkway, Suite 100 — Phone: (540) 373-8860 — Fax: (540) 373-8887

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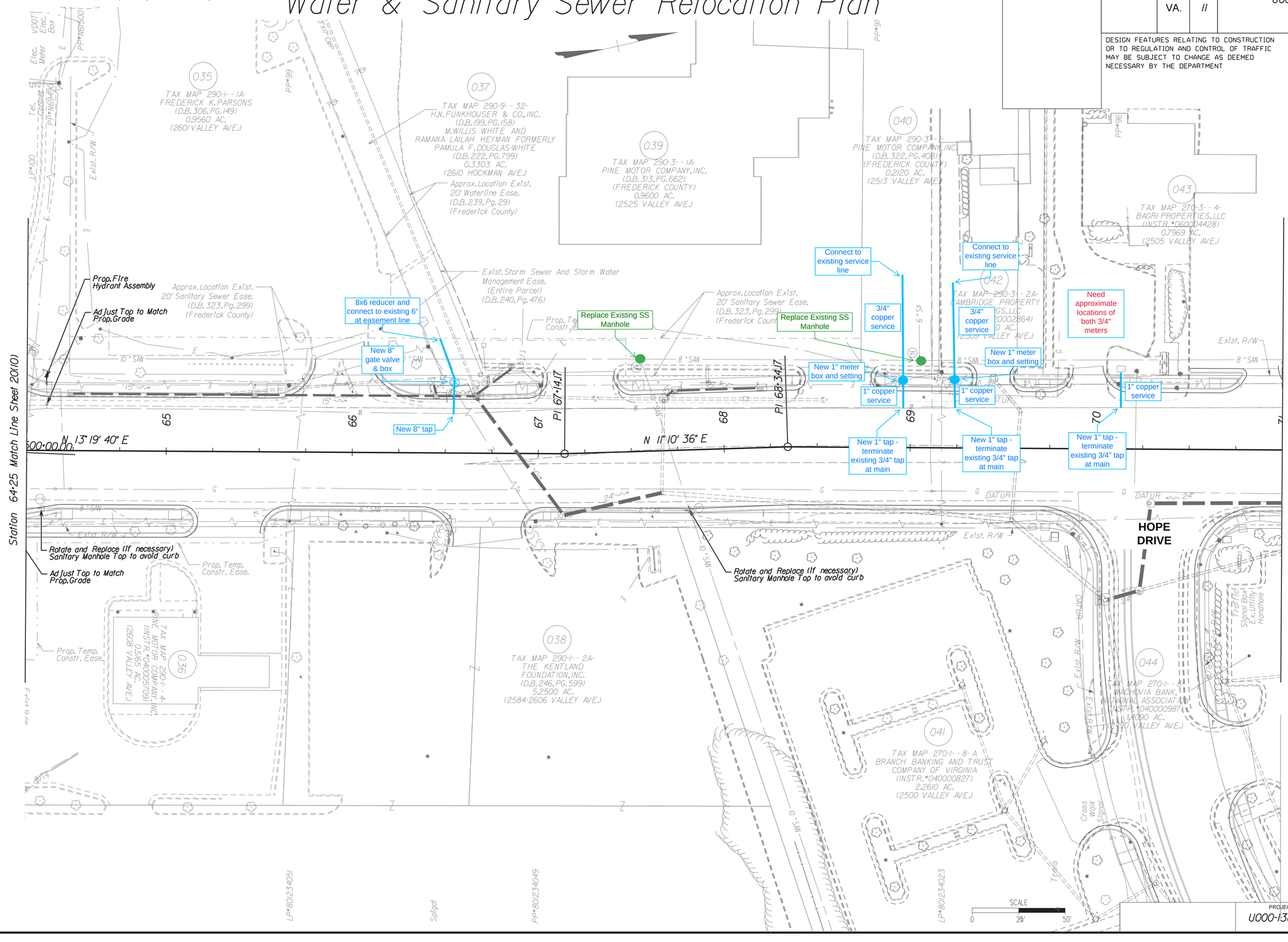
Plotted By: mbeales

PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Banham - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(11)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(11)

Rinker Design Associates, P.C.
Civil Engineering • Surveying • Land Planning
Transportation • Environmental
Right of Way Services
SHOTTON VIII S.B.E.
Office Locations
Corporate Headquarters
4101 Dickens Road
Suite 100
Richmond, VA 23230
Phone: (804) 358-2900
Fax: (804) 358-2901
Winchester Office
107 Kent Street
Suite 101
Winchester, VA 22601
Phone: (540) 667-2085
Fax: (540) 667-2115
Northern Virginia Office
4651 Daly Drive
Suite 100
Chantilly, VA 20151
Phone: (703) 378-0100
Fax: (703) 378-0111

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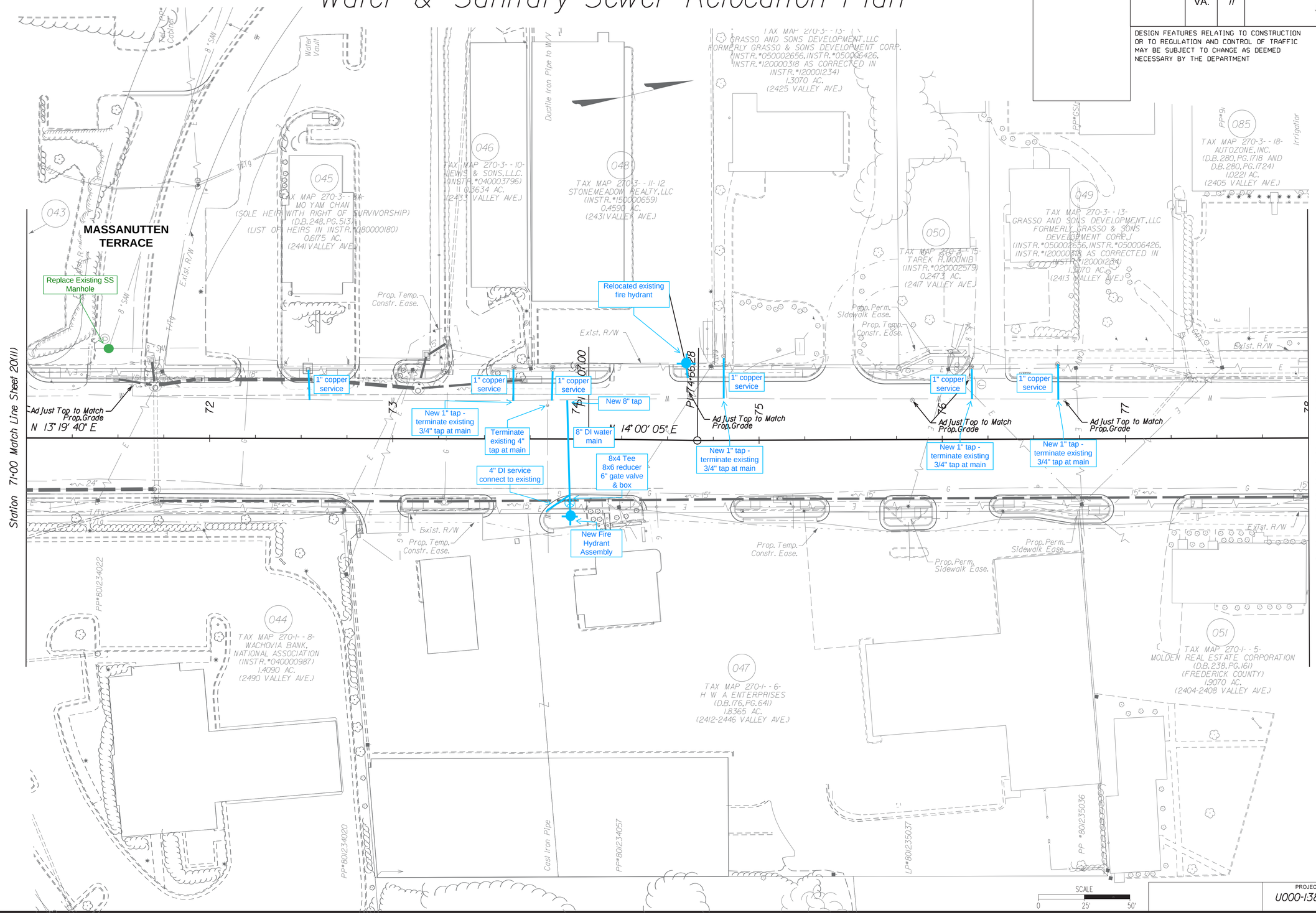
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(12)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(12)

Office Locations
Rinker Design Associates, P.C.
Civil Engineering • Surveying • Environmental
Transportation • Land Development • Right of Way Services
SERVING YOU SINCE 1988
Main Office: 107 Mill Street, Suite 100, Front Royal, VA 22630, Phone: (540) 635-7000, Fax: (540) 635-7001
Winchester Office: 107 Mill Street, Suite 100, Front Royal, VA 22630, Phone: (540) 635-7000, Fax: (540) 635-7001
Sterling Office: 46101 Exploration Drive, Suite 100, Sterling, VA 20164, Phone: (703) 334-0060, Fax: (703) 334-0061

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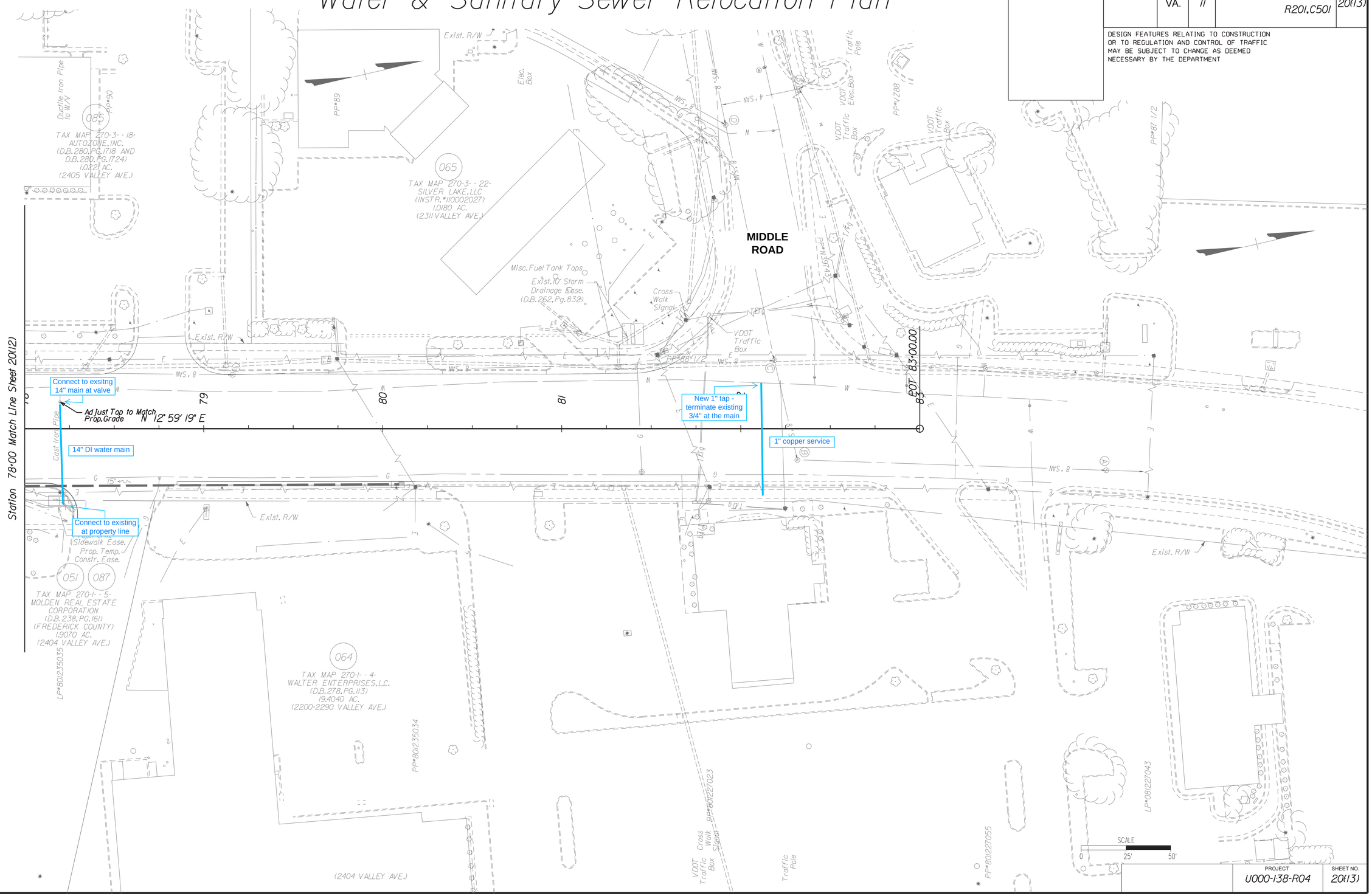
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomelli, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(13)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(13)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Environmental
Transportation - Land Development - Right of Way Services
SHOTTON & NAVEE P.A.
Office Locations
Winchester, Virginia: 107 Piccadilly Street, Suite 100, Winchester, VA 22601, Phone: (540) 667-2085, Fax: (540) 667-2086
Northern Virginia: 4121 Wilson Boulevard, Suite 100, Arlington, VA 22203, Phone: (703) 334-0060, Fax: (703) 334-0061

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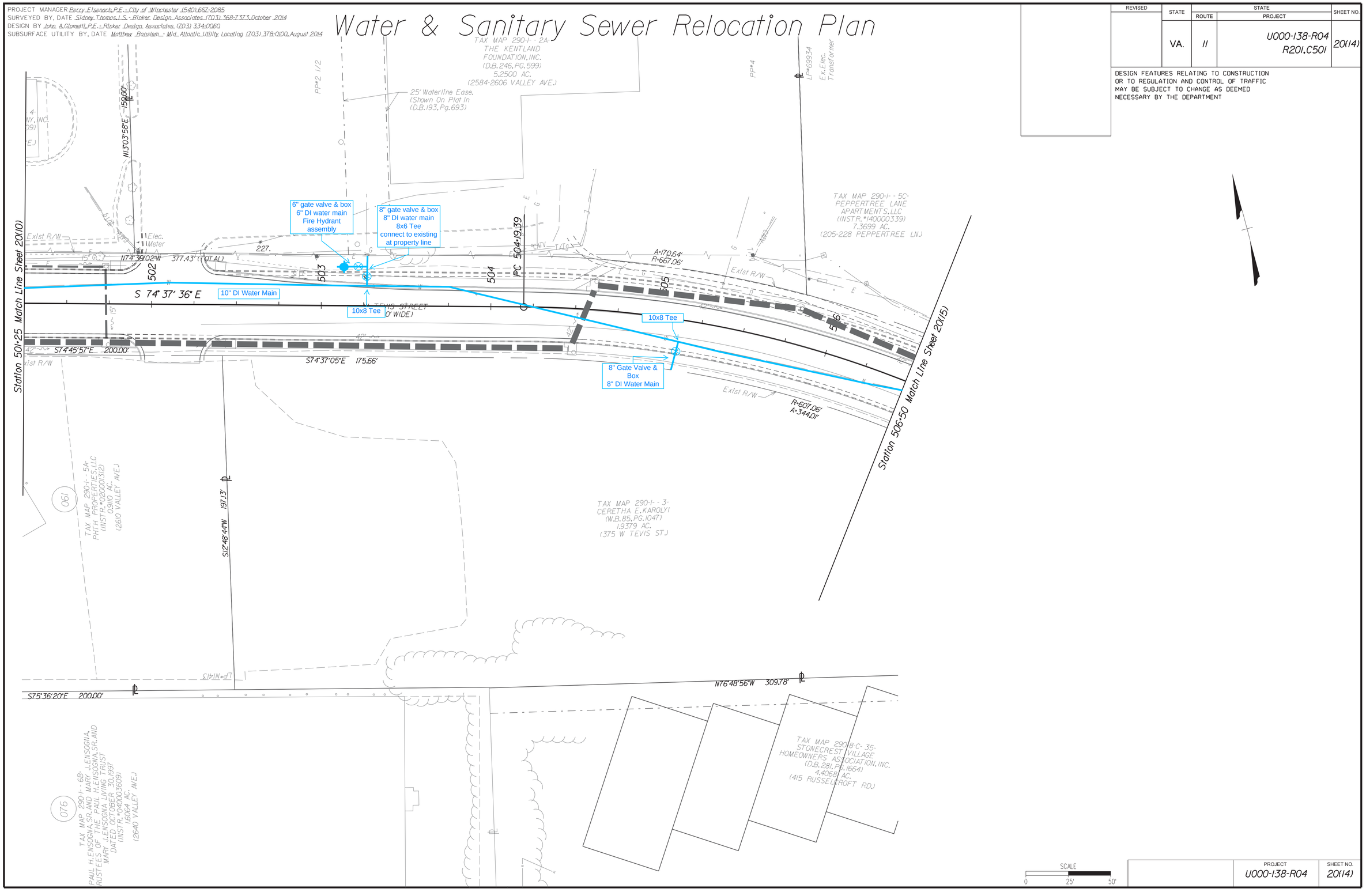
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glometti, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan



REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201, C501	20(14)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

PROJECT	SHEET NO.
U000-138-R04	20(14)

Rinker Design Associates, P.C.
Civil Engineering • Surveying • Transportation
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SERVING THE MID-ATLANTIC REGION
Office Locations
Corporate Headquarters: 8405 Greenwood Avenue, Suite 100, Fairfax, VA 22030, Phone: (703) 591-2800, Fax: (703) 591-0165
Richmond Office: 4914 Fitzhugh Avenue, Suite 100, Richmond, VA 23230, Phone: (804) 353-1580, Fax: (804) 353-0165
Lynchburg Office: 2417 Mary Grove Drive, Suite 101, Lynchburg, VA 24501, Phone: (434) 528-4110, Fax: (434) 528-4111

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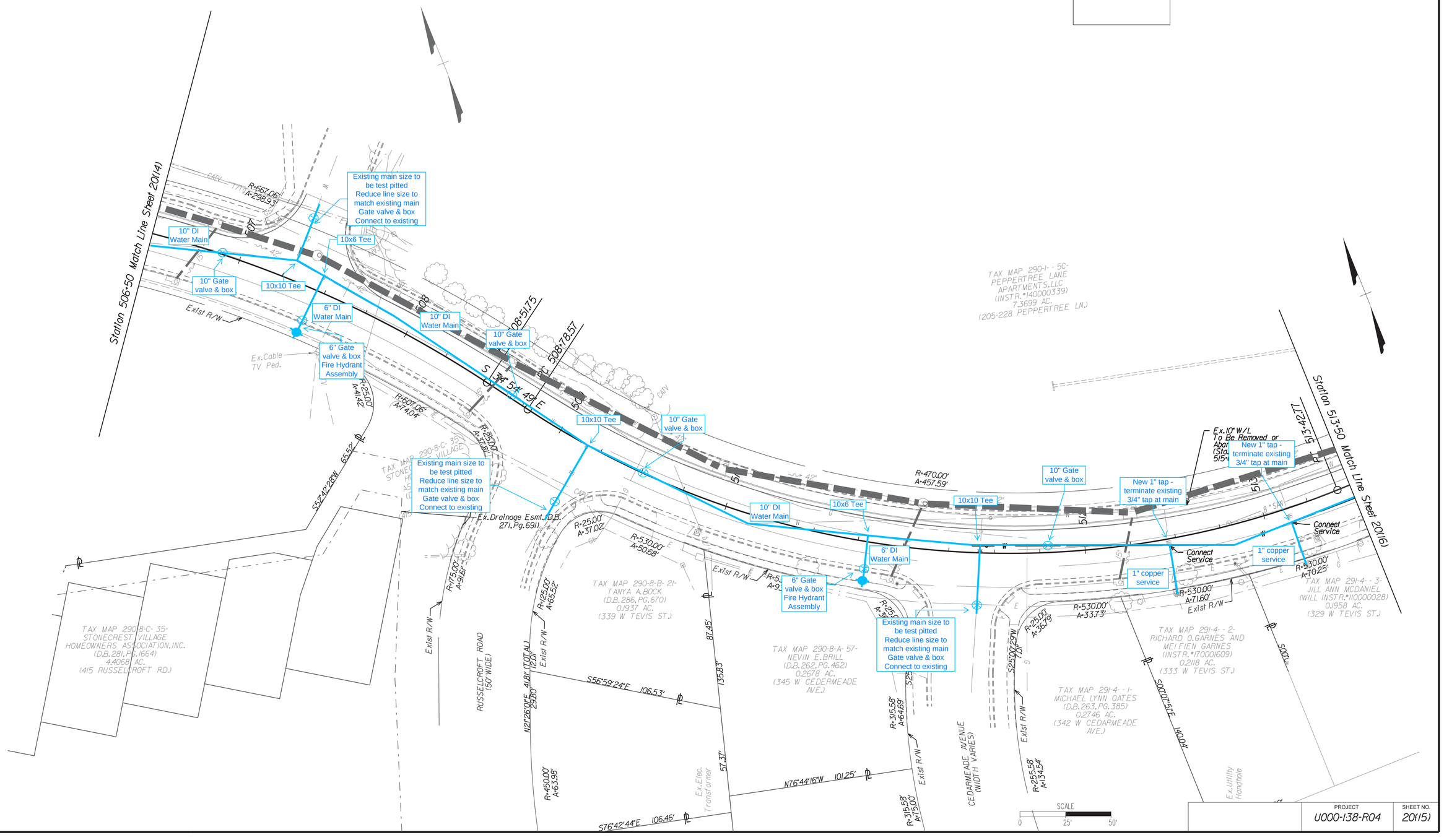
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(15)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(15)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Transportation
Transportation - Environmental
Right of Way Services

Office Locations
Corporate Headquarters
4101 Dickens Road
Suite 100
Richmond, VA 23230
Phone: (804) 358-2366
Fax: (804) 358-2367

4101 Dickens Road
Suite 100
Richmond, VA 23230
Phone: (804) 358-2366
Fax: (804) 358-2367

4101 Mark Center Drive
Suite 100
Alexandria, VA 22304
Phone: (703) 370-7373
Fax: (703) 370-7377

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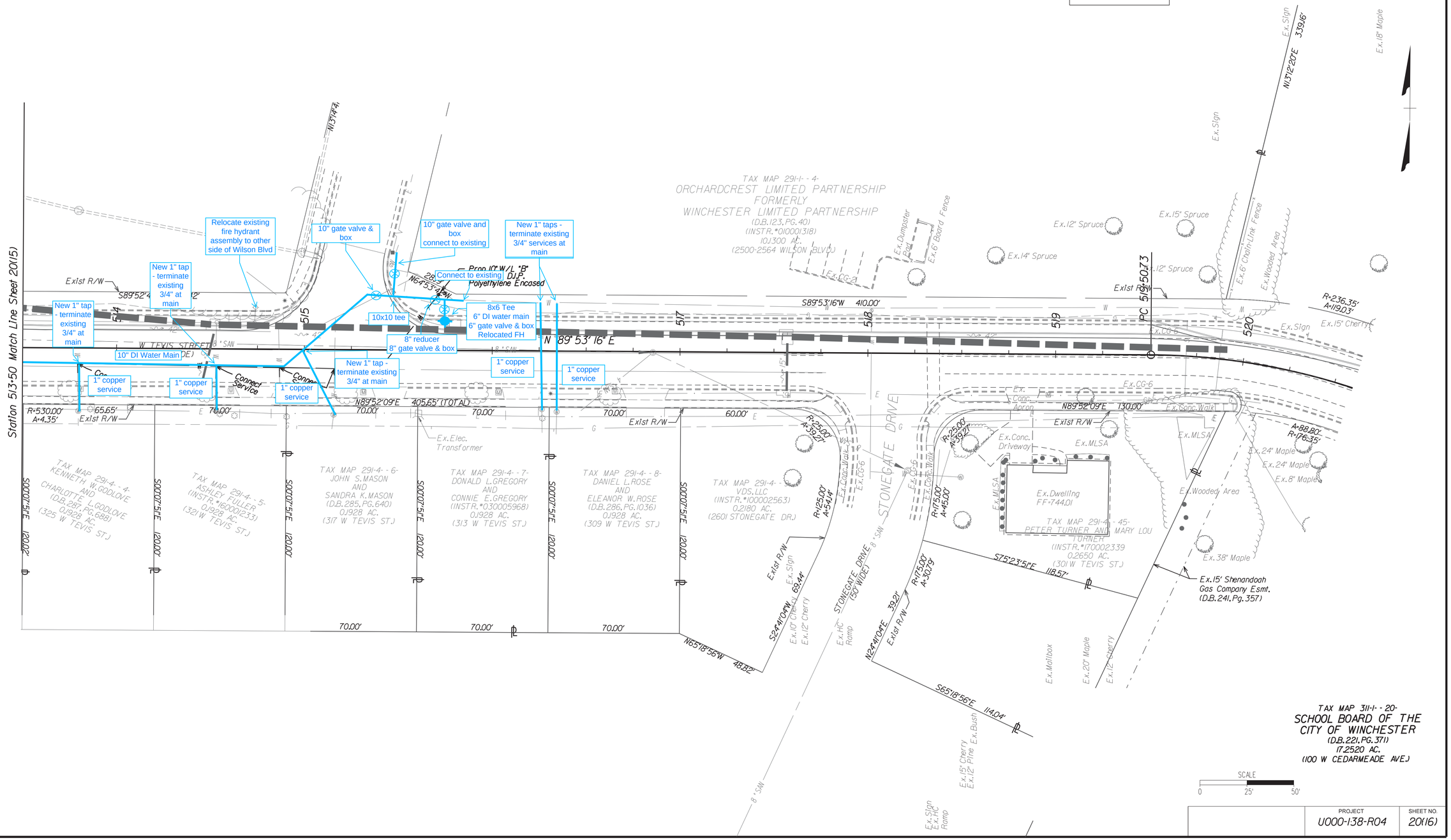
PROJECT MANAGER Perry Eisenach, P.E. - City of Winchester (540) 667-2085
SURVEYED BY, DATE Sidney Thomas, L.S. - Rinker Design Associates (703) 368-7373, October 2014
DESIGN BY John A. Glomett, P.E. - Rinker Design Associates (703) 334-0060
SUBSURFACE UTILITY BY, DATE Matthew Bansiem - Mid Atlantic Utility Locating (703) 378-0100, August 2014

Water & Sanitary Sewer Relocation Plan

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	11	U000-138-R04 R201,C501	20(16)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PROJECT	SHEET NO.
U000-138-R04	20(16)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Transportation
Environmental - Transportation - Right of Way Services
SHOTTS NAVIGATE B.A.R.
Office Locations
Corporate Headquarters: 4101 Fairfax Drive, Suite 100, Arlington, VA 22203, Phone: (703) 334-0060, Fax: (703) 243-0223
Winchester Office: 107 Nelson Street, Suite 100, Winchester, VA 22601, Phone: (540) 667-2085, Fax: (540) 667-0222
Fairfax Office: 4101 Fairfax Drive, Suite 100, Arlington, VA 22203, Phone: (703) 334-0060, Fax: (703) 243-0223