

To: Jeannie Swim, Fairfax Water	
From: Ken Demmons, P.E.	Project: Route 29 Bridge Replacement over Little Rocky Run VDOT #0029-029-128, PE101 Per plans received on January 23, 2012
CC: File	
Date: February 21, 2012	Fairfax Water Job No: P2464

RE: Review of Final Utility Field Inspection Plans

HDR received the Final Utility Field Inspection (UFI) plans for the Route 29 Bridge Replacement over Little Rocky Run project (VDOT #0029-029-128, PE101) project on January 23, 2012. The final UFI scheduled for February 21, 2012 was cancelled and rescheduled with potential design/build teams on July 19, 2012.

1. **Project Limits & VDOT Scope of Work:** The project limits are along Route 29, starting 0.2 miles east of Pickwick Road and ending at the intersection of Union Mill Road. The primary purpose of the VDOT project is to replace the bridge over Little Rocky Run and widen the roadway approaches on both sides. The project also includes storm drainage improvements, including a storm water management basin.

2. **Fairfax Water facilities within the project limits:**
 - 12-IN cast iron water main with appurtenances and service connections (located within right-of-way on the westbound side of Route 29).
 - 24-IN ductile iron water main with appurtenances (located in a 24-ft easement on the eastbound side of Route 29).
 - See attached Conflict Analysis Table dated February 21, 2012. Conflicts and comments are organized by plan sheet and identified in the table.

3. **Relocation Summary:**
 - **24-IN Ductile Iron Water Main:** Relocate from Sta. 102+00 to Sta. 119+25 due to conflicts with the bridge replacement, storm drainage improvements, and pavement replacement. HDR recommends an alignment south of the existing alignment that stays within the proposed right-of-way. The alignment would be within the 10-ft wide shared use path to stay within the right-of-way. To avoid bridge construction, HDR recommends jogging into the proposed VDOT utility easement at Sta. 109+25. The alignment would parallel the bridge to Sta. 112+00, then jog back into the right-of-way and continue under the shared use path to Sta. 119+25. Relocation will include the following:
 - Reconnection of 12-IN water main and valve (Sta. 103+38, 50' RT)
 - Replacement / relocation of blow-off hydrant and 6-IN valve (Sta. 110+70, 38' RT)
 - Abandonment/replacement of butterfly valve and air release valve (Sta. 114+30, 40' RT)

Approximate Length = 1,725 feet

- The following are valve box adjustments:

- Adjustment of 12-IN valve box (Sta. 122+50, 65 ft RT)

➤ 12-IN Cast Iron Water Main:

- Relocate from Sta. 105+50 to Sta. 117+75 due to conflicts with the bridge replacement, storm drainage improvements and pavement replacement. HDR recommends an alignment south of the existing alignment that stays within the right-of-way. At the proposed bridge, HDR recommends jogging north around the bridge to utilize VDOT’s proposed utility easement to Sta. 113+50. Near Sta. 113+50 it is recommended to jog back in the right-of-way and maintain an alignment to Sta. 117+75. Relocation will include the following:
 - Reconnection of 8-IN water main and 8-IN and 12-IN valves (Sta. 104+17, 30’ LT)
 - Reestablishment of service connection and water meter relocation (Sta. 105+50, 72’ RT)
 - Reestablishment of 6-IN hydrant connection (Sta. 106+80, 40’ LT)
 - Reestablishment of service connection and water meter relocation (Sta. 107+95, 54’ RT)
 - Relocation of (2) 12-IN valves (Sta. 110+85, 50’ LT)
 - Replacement / relocation of fire hydrant and valve (Sta. 111+08, 50’ LT)
 - Abandonment of existing 8-IN water main connection (Sta. 110+78, 50’ LT)
 - Reestablishment of service connection (Sta. 115+90, 62’ LT)

Approximate Length = 1,225 feet

- The following are valve box and water service adjustments:
 - Adjustment of 8-IN and 12-IN valve boxes (Sta. 104+17, 30’ LT)
 - Adjustment of service (Sta. 105+50, 37’ RT)
 - Adjustment of service (Parcel 006 – if existing)
 - Adjustment of service (Sta. 118+48, 50’ LT)
 - Adjustment of service (Sta. 119+70, 32’ LT)
 - Adjustment of service (Sta. 120+70, 43’ LT)
 - Adjustment of fire hydrant (Sta. 121+75, 62’ LT)
 - Adjustment of 6-IN valve box (Sta. 121+80, 30’ LT)

Additional service adjustments/relocations will be reviewed by HDR after obtaining Fairfax Water service connection records.

4. Sequencing of Relocations within VDOT Project:

- 24-IN Ductile Iron Water Main: The existing 24-IN water main is presently outside of the pavement. Route 29 will be widened to the south, placing the water main primarily in the eastbound lanes. The eastbound lanes will be constructed during phase 2 of the project. The water main crossing Little Rocky Run will need to be relocated prior to the beginning of Phase 2 and 10-ft wide shared use path.
- 12-IN Cast Iron Water Main: The existing 12-IN water main is primarily on the northern edge of the westbound lanes of existing Route 29. All traffic will be moved to the westbound lanes and existing median during phases 1 and 2 of the project. In Phases 3 and 4, traffic will be moved to the newly constructed eastbound lanes and the westbound bridge structure will be removed. The 12-IN water main will need to be relocated prior to the beginning of Phase 3.

5. Constructability of Relocations:

- 24-IN Ductile Iron Water Main: The existing 24-IN water main must be relocated before the bridge

construction begins. There is insufficient room in the proposed right-of-way to install the 24-IN water main as the installation will need sufficient clearance from the bridge to prevent damage and/or settlement during the bridge construction.

- There is a proposed VDOT utility easement on the south side of the bridge. It is assumed this easement was obtained for the relocation of the 24-IN water main.
- 12-IN Cast Iron Water Main: The existing 12-IN water main must be relocated before the bridge construction on the westbound side begins. There is insufficient room in the proposed right-of-way to install the 12-IN water main as the installation will need sufficient clearance from the bridge to prevent damage and/or settlement during the bridge construction.
 - There is a proposed VDOT utility easement shown on the east side of the bridge. The extent of easement/right of way on the west side is not clear. Existing gas and communications utilities are also in this area. Further evaluation is needed to determine where the 12-IN water main can be relocated across the creek

6. **Test Hole Requests:** None at this time.

7. **Opinion of Probable Construction Cost (OPCC):**

- Additional information is required regarding construction techniques through Little Rocky Run to provide an OPCC at this time. HDR will discuss various methods with Fairfax Water staff and provide an OPCC as directed.
- Pro-Rate Share: 100% VDOT, 0% Fairfax Water

8. **Attachments:**

- Conflict Analysis Table

Conflict Analysis – February 21, 2012

Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
<u>Sheet No. 3 - Roadway and Drainage Improvements</u>				
1	102+00 to 107+00, 50 ft RT	Drainage Structures: ➤ 15-in SD (3-7 to 3-6) ➤ Structure 3-6 ➤ 15-in SD (3-6 to 3-5) ➤ Structure 3-5 ➤ 18-in SD (3-5 to 4-2)	24-in DI WM	Horizontal clearance less than 5 ft. Test holes within limits: ➤ TH #14 : Elev. = 316.03 (top) ➤ TH #15 : Elev. = 309.93 (top) ➤ TH #16 : Elev. = 305.87 (top) ➤ TH #46 : Elev. = 321.88 (top)
<p>To avoid relocation: propose to move storm drainage under gutter pan. Modify structures 3-6 and 3-5 to obtain more horizontal clearance. As designed, the vertical clearance between bottom of storm structure and 24" WM is as follows: Str. 3-6 clearance = 0.22'; Str. 3-5 clearance = 1.26'.</p> <p>Relocation at bridge is still required; this section would be an extension of the relocation for the bridge so perhaps not worth the trouble to redesign storm drainage. Leaving 24" WM in current location would put it in right lane, close to edge of center lane for 150'-200'.</p>				
2	103+38, 50 ft RT	Sidewalk	12-in DI WM branch off 24-in DI WM (Parcel 010)	Adjustment of 12-in valve box.
3	104+17, 30 ft LT	Paving	8-in WM branch off 12-in CI WM (Parcel 001)	10' of the 8-in WM will have less than 2' of cover during construction. Ranging from 1.6' to 2'. Adjustment of 8-in and 12-in valve boxes. Note, 12-in valve is not shown in the survey. Refer to record drawings S-4025-1.

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Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
<u>Sheet No. 3 - Roadway and Drainage Improvements</u>				
4	105+50, 72 ft RT	Paving	Water service off 12-in CI WM (Parcel 011)	Extension of water service and relocation of water meter.
5	106+80, 40 ft LT	Paving	6-in Fire hydrant lead off 12-in CI WM (Parcel 02)	Adjustment of 6-in valve box.
6	105+50 to 107+50, 33 ft LT	Pavement Cut	12-in CI WM	Less than 2 ft of cover will be over existing WM when pavement section is constructed. *Conflict continues to Sta.110+75, then starts again at Sta. 115+25 and continues to Sta.118+00.

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Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
Sheet No. 4 - Roadway and Drainage Improvements				
1	108+40 to 110+10, 47 ft LT	Drainage Structures: ➤ Structure 4-6 ➤ 15-in SD (4-7 to 4-6) ➤ Structure 4-7 ➤ 15-in SD (4-8 to 4-7) ➤ Structure 4-8	12-in CI WM	Horizontal clearance less than 5 ft and direct conflict with SD structure 4-8. Test holes within limits: ➤ TH #28 : Elev. = 305.09 (top) ➤ TH #29 : Elev. = 305.16 (top)
2	107+95, 54 ft LT	Sidewalk Drainage Structure: ➤ 15-in SD (3-2 to 4-6)	Water service off 12-in CI WM (Parcel 004)	Water meter box is on the edge of the proposed VDOT curb ramp. Valve box will need adjustment and meter may need to be relocated. (12" WM will be relocated in this area.)
3	110+85, 50 ft LT	Gutter pan / curb	12-in valves	12-in valves are located in proposed gutter pan. Recommend relocating valves with Item No. 6.
4	111+08, 50 ft LT	Bridge construction	Fire Hydrant	Direct conflict. Hydrant will be relocated with Item No. 6.

Conflict Analysis – February 21, 2012

Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
<u>Sheet No. 4 - Roadway and Drainage Improvements</u>				
5	113+90, 52 ft LT to 116+75, 44 ft LT	Drainage Structures: ➤ Structure 4-12	12-in CI WM	Direct conflict. Recommend relocating 12-in WM with Item No. 6. Test holes within limits: ➤ TH #20 : Elev. = 303.60 (top)
6	<i>(Refer to evaluation of Sheet 1B regarding conflicts with the bridge construction.)</i>			
7	107+50 to 110+75, 44 ft LT	Pavement Cut	12-in CI WM	Less than 2 ft of cover will be over existing WM when pavement section is constructed.
8	108+00 to 110+75 112+31 to 114+00	Fill Fill	24-in DI WM 24-in DI WM	Cover > 8'. Proposed cover is 9-12'.

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Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
Sheet No. 5 - Roadway and Drainage Improvements				
1	114+28, 40 ft RT	Paving	Air release valve and 24-in BV on 24-in DI WM	Adjustment of valve boxes and removal of witness post. (See item #2)
2	114+00 to 116+25	Fill	24-in DI WM	Proposed cover is 7'-11'. (Existing cover in some locations is 7'-8' but for shorter distance)
3	116+50 to 118+75, 50 ft RT	Drainage Structure: ➤ Structure 5-8 ➤ 15-in SD (5-9 to 5-8) ➤ Structure 5-9	24-in DI WM	Horizontal clearance less than 5 ft. Test holes within limits: ➤ TH #26 : Elev. = 307.28 (top) ➤ TH #27 : Elev. = 312.13 (top) ➤ TH #61 : Elev. = 303.52 (top)
4	113+90, 52 ft LT to 116+25, 44 ft LT	Drainage Structures: ➤ 15-in SD (4-12 to 5-3) ➤ Structure 5-3 ➤ 18-in SD (5-4 to 5-3) ➤ Structure 5-4 ➤ 15-in SD (5-5 to 5-4)	12-in CI WM	Horizontal clearance less than 5 ft. Test holes within limits: ➤ TH #21 : Elev. = 304.44 (top) ➤ TH #36 : Elev. = 308.80 (top) ➤ TH #51 : Elev. = 312.77 (top)

Conflict Analysis – February 21, 2012

Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
<u>Sheet No. 5 - Roadway and Drainage Improvements</u>				
5	115+90, 62 ft LT	Drainage Structure: ➤ 15-in SD (5-5 to 5-4)	Water service off 12-in CI WM (Parcel 005)	Relocation / reconnection of water service. 15-in SD has 2 ft of cover.
6	118+48, 50 ft LT	Paving	Water service off 12-in CI WM (Parcel 007)	Extension of water service and relocation of water meter box. Note, existing water meter is not shown in latest roadway drawings.
7	119+70, 32 ft LT	Paving	Water service off 12-in CI WM – May be abandoned (Parcel 007 or 008)	Record drawings S-3810-3 indicate a fire hydrant, 6-in valve, and 12-in x 6-in tee was removed at this location and a spool piece was sleeved in. Recommend field verifying this location.
8	115+25 to 117+75, 50 ft LT	Pavement Cut	12-in CI WM	Less than 2 ft of cover will be over existing WM when pavement section is constructed.
9	117+00 to 118+50, 48 ft RT	Pavement Cut	24-in DI WM	Less than 2 ft of cover will be over existing WM when pavement section is constructed.

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Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
<u>Sheet No. 6 - Roadway and Drainage Improvements</u>				
1	120+70, 43 ft LT	Paving	Water service off 12-in CI WM (Parcel 008)	Extension of water service and relocation of water meter box. Note, water meter is not shown on roadway drawings.
2	121+80, 30 ft LT	Paving	Fire hydrant off 12-in CI WM	Adjustment of 6-in valve box.
3	122+50, 65 ft RT	Paving	12-in Valve	Adjustment of 12-in valve box. Note, 12-in valve is not shown on survey. Refer to record drawing P-1532-1.



Route 29 Bridge over Little Rocky Run
VDOT #0029-029-128, PE101

Conflict Analysis – February 21, 2012

Item No.	Station(s) / Offset(s)	Conflicting Improvement	Fairfax Water Facility	Comments
<u>Sheet No. 1B - Bridge Replacement</u>				
1	110+75 to 112+31	Bridge Replacement	24-in DI WM & 12-in CI WM	Both water mains are in direct conflict with the bridge replacement. This includes relocating both hydrants off the 12-in and 24-in WM's and blow-offs.

Pictures of original Fairfax Water 24-inch water transmission main - Little Rocky Run

