COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

DEPARTMENT OF PUBLIC UTILITIES

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To: All Holders of DPU Standards

From: Director, Department of Public Utilities

Re: **Revised Design and Construction Standards**

Date: June 23, 2014

DPU Standards have been revised and are effective for new plans submitted on or after September 1, 2014. For projects currently under review, the engineer may choose to continue with design under either the current or revised Standards provided plan approval will occur before January 1, 2015. All plans approved after January 1, 2015 shall be in accordance with the new Standards. Construction on any project beginning after January 1, 2015 shall comply with all construction requirements and materials in the new Standards.

We will plan a forum for design engineers in August 2014 to discuss these Standards and discuss any questions that you might have.

A copy of the Standards is posted on the DPU web site. Copies of the Standards will be available from DPU Public Information upon request. Hard copy will be available at a cost of $75. A digital copy on cd will be available at no cost.

In addition to our response to specific comments received for the draft DPU Standards, changes to requirements most often seen during plan review include:

1. Detector checks will no longer be required on fire protection systems. The backflow device shall be provided with a meter for detection. See Standard Drawings D-420, D-425, D-430, and D-435 for fire protection systems.

2. Copper service lines to 1-1/2" and 2" meters. The previous Standards required 4" ductile iron water service to 1-1/2" and 2" meters, with a 2" plug tapped 2", and a short run of copper to the meter. The new standards allow 2" copper water service to be run from a 2" corporation stop at the main to the meter, provided the length of 2" copper water service is not more than 25 feet. In cases where a longer service is required, 4" ductile iron pipe, with a 4" plug tapped 2" shall be used. The length of 2" copper service shall not exceed 25 feet. See Standard Drawing D-530 for details of water services for 1-1/2" and 2" meters.

3. The diameter of sanitary sewer manholes will no longer be just a function of pipe diameter and deflection angle, as required by current Standards, but will now include consideration of flow regime (super-critical or sub-critical). This change results from analysis of actual system operation where DPU experienced situations including unexpected grease blockage of the main. An approximate method based on pipe slope is included to aid in the determination of flow regime. This change is intended to cause the hydraulic jump that occurs when flow changes from super-critical to sub-critical to be located within the manhole rather than within the sewer pipe.

4. There are changes to design standards and material specifications resulting from experience with pipe corrosion and the resulting failure of water mains and sewer force mains related to corrosion.

5. Significant changes for meter installations have been made including requirements for meter boxes, vaults and meter setters.

6. Virginia Department of Health required changes include providing profile for all water mains that are 8" diameter and larger and changes for water main disinfection and testing. Water samples are now required at 1200 feet intervals.

7. In order to better comply with Miss Utility requirements to allow location of existing water and sewer mains, use of passive marker balls is now required.

7. A new Standards section that lists acceptable materials and manufacturers has been added.

Specific responses to comments received on the Draft Standards are as follows:

1. Comment: In Section 12.2.20.C. consider adding after "mechanical joint" the following: "x flanged connection. Flanged end shall have centering lip."

   Response: Section 12.2.20.C. has been revised as requested.

2. Comment: In Section 12.2.20.E. consider adding: "Valves shall be fusion bonded epoxy coated inside and out."

   Response: Section 12.2.20.E has been revised to read:

   "E. All valves shall be fusion bonded epoxy coated inside and out, or shall be field-coated with mastic prior to installation. Mastic shall be Roskote R28 or equal."

3. Comment: In Section 12.2.21. consider adding: "Valves shall be fusion bonded epoxy coated inside and out."

Response: Section 12.2.20.I. has been revised to read:

"I. All valves shall be fusion bonded epoxy coated inside and out or shall be field coated with mastic prior to installation. Mastic shall be Roskote R28 or equal."

4. Comment: In Section 13.2.3. consider adding "C. Injection molded fittings shall be used in lieu of fabricated fittings whenever commercially available."

   Response: No change has been made. In general DPU uses ductile iron fittings. In cases where we use PVC fittings, they are all fabricated.

5. Comment: In Section 14.3.P.3. Change "Kennedy K-81A Guardian" to "Kennedy K81D Guardian."

   Response: This revision has been made as requested.

6. Comment: In Section 14.4.F.(2.)a. change "Multi Fit" to "Multi Fittings."

   Response: This revision has been made as requested.

7. Comment: In Standard Detail Drawing D-515 Plastic Meter Box For 5/8" Meters and Flushing Hydrants, the drawing has 24" Meter Box written on it but it shows a 20" Diameter box. Should the 24" be 20" Meter Box?

   Response: Standard Drawing D-515 has been revised as requested to show a 20" diameter box, 24" deep.

8. Comment: Section 1.1.02G.1. – VSMP permits are now handled by DEQ.

   Response: This has been corrected.

9. Comment: Section 7 (Details D-155 and D-160) – consider including separate details for vandalproof (traffic and non-traffic rated) and watertight (traffic and non-traffic rated) frames and covers.

   Response: No change has been made. Traffic rated vandalproof and watertight frames and covers are now identical, as well as the non-traffic rated vandalproof and watertight frames and covers. One detail is sufficient for traffic-rated vandalproof/watertight frames and covers, and one detail is sufficient for non-traffic rated vandalproof/watertight frames and covers.

10. Comment: Section 7 (Detail D-470) – consider changing MJ fitting to Restrained Joint on the tapping sleeve and valve detail.

Response: Tapping valves have a Mechanical Joint outlet. Joint restraint is handled on a case by case basis as needed.

11. Comment: Section 7 (Detail D-485) – consider changing Retainer glands to Restrained Joint on the typical waterline vertical realignment detail.

    Response: Standard Drawing D-485 has been revised as requested.

12. Comment: Section 7 (Detail D-495-1) – consider changing Retainer glands to Restrained Joint on the typical fire hydrant detail.

    Response: Standard Drawing D-495-1 has been revised as requested.

13. Comment: Section 8.1.10.A – add reference to Section 14 (Approved Water and Sewer Materials).

    Response: Section 8.1.10.A.(1). has been revised as follows:

    (1.) All materials shall conform to the County of Henrico "Approved Water and Sewer Materials List" contained in Section 14. All materials to be incorporated in the work shall be new and unused as delivered from the supplier. The Contractor shall submit a notarized statement from the Supplier and/or Manufacturer to the Engineer that all materials being supplied for the work meet AWWA, ASTM and/or County Standards as appropriate. The Contractor shall provide at least three (3) copies for the County's use along with any additional copies needed to be returned to Contractor, Engineer, Suppliers, etc. after approval is made.

14. Comment: Section 10.3.5C&D – reference PVC and DI pipe bedding details in lieu of Class B, C and C-1.

    Response: Sections 10.3.5.C. and 10.3.5.D. have been revised as follows:

    "C. Pressure lines shall be installed with bedding as indicated in Standard Drawings D-710-1 and D-710-2 for PVC pipe and D-730 for ductile iron pipe.

    (1.) Excavate for bell holes at each joint so that the entire barrel of pipe shall be fully supported the entire length.

    (2.) Where rock is encountered, excavate 6 inches below the bottom of the pipe for bedding in granular material.

    D. Gravity sewer lines shall be installed with bedding as indicated in Standard Drawings D-710-1 and D-710-2 for PVC pipe and D-730 for ductile iron pipe."

15. Comment: Section 12.2.19F and Section 12.2.20E and Section 12.2.21I – change "Hydroshield 451" to "Roskote R28."

    Response: These three sections have been revised as follows: "All valves shall be fusion bonded epoxy coated inside and out, or shall be field-coated with mastic prior to installation. Mastic shall be Roskote R28 or equal."

16. Comment: Section 13.2.4 – consider referencing Section 14.4A/1/b.

    Response: Section 13.2.4 has been revised as follows:

    "13.2.4. Ductile iron pipe shall meet requirement of AWWA C151 for the pressure and thickness classes shown on the Drawings. Pipe shall have cement-mortar lining and an asphaltic seal coat. Thickness classes shall meet requirements of AWWA C150. See Section 14.4.A.1(b) for acceptable pipe manufacturers."

17. Comment: Section 14.3C/2 – consider adding Series 70 metersetters for 5/8" and 1" meters

    Response: No change has been made. The Ford Series 70 metersetters for 5/8" and 1" meters have one cutoff valve. The model 270 has two cutoff valves, one on the County side of the meter and one on the Customer side. DPU uses the metersetters with the two cutoff valves. Therefore, this section has not been revised.

18. Comment: Section 14.4 – specify epoxy coating for DI pipe (Protecto 401 or equal).

    Response: This requirement has been added as a new section, Section 14.4.A.(1.)(c.).

19. Comment: Section 14.4D – consider separating the vandalproof (traffic and non-traffic rated) and watertight (traffic and non-traffic rated) frames and covers.

    Response: No change has been made. Traffic rated vandalproof and watertight frames and covers are now identical, as well as the non-traffic rated vandalproof and watertight frames and covers. One detail is sufficient for traffic-rated vandalproof/watertight frames and covers, and one detail is sufficient for non-traffic rated vandalproof/watertight frames and covers.

20. Comment: Section 2.2.04.H.: Recommend a clearer reference to the table (i.e. cite a page number, label as Table 2.1 with the same reference in the text).

    Response: Section 2.2.04.H. has been revised as follows:

"H. Sewers should intersect in manholes at deflection angles not greater than 90 degrees. The table on page 2-8 shows maximum deflection angles for various sizes of downstream and upstream pipes.

(1.) Maximum deflection angle is determined using a minimum radius of 2 times the upstream sewer diameter for subcritical flow. If this condition can not be met, a larger diameter manhole will be required to achieve the minimum radius.

(2.) All PCs and PTs of connecting pipes shall be at the manhole sidewalls.

(3.) The designer must satisfy the Department that the minimum radius is satisfied and that adequate losses have been provided in the hydraulic analysis."

21. Comment: Section 2.2.05.F.: Utilizing acid resistant materials for 4000' downstream of discharge is quite a jump for the previous requirement of 1200'. Has sulfide degradation been consistently found that far downstream? My concern is requiring more resources than is necessary.

    Response: Results from a corrosion study done in 2003 found sulfide degradation as far as 4000 feet downstream from a force main discharge. Specific examples are the James River Outfall (42"), Maple Avenue Outfall (48"), and the Four Mile Creek Outfall (60"-84") among others. Since PVC is the common pipe for most sewers, there is little impact on the main line. The real impact of this extended distance is that manholes this far downstream may receive some interior lining. Any changes due to the 4000' requirement will be handled in design.

22. Comment: Section 4.2.07.B.: Reconsider requiring a profile for every service line crossing a ditch. I am not aware of this being required on plans, though it has been in the Standards. My opinion is that a typical detail or note on the plans stating the minimum cover would be adequate. What happened to Detail D-220? For any plans with multiple connections across a ditchline, I feel that the profiles would consume a significant amount of unnecessary time, resources, and space on construction plans, especially when multiple connections, such as a subdivision, are required.

    Response: No change has been made. The Standard Drawing (D-520-2) illustrates typical installations. Any particular crossing that is not in accordance with the Standard Drawings requires a specific profile. This detail is required on all plans.

23. Comment: Section 5.5.H.: This requirement is duplicated in Section 5.8.F.

    Response: No change has been made. Section 5.5H. is a general requirement for all construction plans. Section 5.8.F. is a specific requirement for all construction plans for water distribution facilities.

24. Comment: Section 5.8.J.: This requirement is duplicated from Sections 5.5.S. and 5.5.T.

    Response: No change has been made. Section 5.5.S. requires the Engineer to show the location of all marker balls on plans submitted for approval. Section 5.5.T. requires this information to be shown on all as-built plans – e.g., plans marked up by our Inspector. Section 5.8.J lists specific requirements for plans for water distribution facilities.

25. Comment: Form F-1: The checklist requires profiles for water mains 12 inches in diameter and larger. However, Section 5.8.C. requires profiles for all water lines. Consistency in this area is needed. I suggest either requiring profiles for any water "mains" or specify a cutoff size (i.e. 6") while requiring profiles of smaller mains with any crossings.

    Response: In accordance with VDH requirements, Form F-1 and Section 5.8.C. have been revised to require profiles of all water mains 8" diameter and larger.

26. Comment: Form F-4: Add a revision date in the lower left corner.

    Response: Revision date has been added.

27 Comment: Form F-5: Revise the contact people at the bottom of the Information Sheet Guidelines as Tyrone Watkins has transferred positions.

    Response: Form F-5 has been corrected.

28. Comment: Drawing D-050-2: Recommend a stipple hatch for paving since it is commonly used on utility projects.

    Response: No change has been made. Instead of including pavement in the standard symbols, more information is contained in Section 5.4.F., which states:

    "Shading and/or hatching, such as on plan views for paving, shall not be used on the drawings where it will hide any information when the drawing is photocopied or scanned.

    (1.) Shading with a pencil or using dark film on original reproducibles will not be accepted.
    (2.) For areas that need to be identified or highlighted, stippling or cross hatching may be used provided no other information is hidden."

29. Comment: Drawing D-135: It appears that the lower profile view is unnecessary, as the upper profile already shows everything that is in the lower profile plus dimensions.

    Response: The lower profile has been removed from Standard Drawing D-135.

30. Comment: Drawing D-140: Clarify the purpose of, or remove, the black rectangle directly underneath the drawing title.

    Response: The black rectangle has been removed from Standard Drawing D-140.

31. Comment: Drawing D-205: Recommend removal of the 12" pipe label, as this could apply to any size sanitary sewer pipe.

    Response: The reference to 12" pipe has been removed from Standard Drawing D-205.

32. Comment: Drawing D-205: Recommend revising Note #2 to specify what is considered the "crossing." Should the encasement extend 10' past the normal water level, a certain flood level, top of bank, etc.?

    Response: Note 2 on Standard Drawing D-205 has been revised to require that casing pipe extend a minimum of 10' past the top of bank on both sides of the crossing.

33. Comment: Drawing D-210-1: Step label incorrectly references old Detail D-113, which is now D-145.

    Response: Standard Drawing D-210-1 has been corrected to refer to D-145 for the step detail.

34. Comment: Drawing D-210-3: The location of this detail on the manhole is unclear, as well as what the large black figure at the top of the detail is.

    Response: The large black object is a gasket and has now been called out as such on the drawing.

35. Comment: Drawing D-495-1: The ditch and shoulder cross section is unclear. Clarify if the valve is to be located in the shoulder or the pavement. Clarify the pavement location, as it appears above the sloped shoulder is earth fill. Recommend showing a minimum cover at the ditch line with a more defined ditch. Ditch slopes vary, so I recommend against showing a 2:1 ditch slope and simply labeling the ditch.

Response: The intent of this drawing is to show the relationship of the fire hydrant with respect to the curb and gutter or roadside ditch. In addition, it was intended to show that if the water main is located within pavement, the hydrant valve will be in the pavement; if the water main is in the shoulder, the hydrant valve will be in the shoulder. Under no circumstances are valves to be placed in a ditch. In order to clarify the drawing, reference to 2:1 slopes has been removed; the ditch has been enlarged to make it more prominent, and it has been labeled "ditch."

36. Comment: Drawing D-520-2: Ditch slopes vary, so I recommend against showing a 2:1 ditch slope and simply labeling the ditch.

    Response: Standard Drawing D-520-2 has been revised to remove reference to 2:1 slopes, and the ditch has been labeled "ditch."

37. Comment: Section 12.15.3.B.2-3: Would the last sentence in (2) referencing sodium hypochlorite be better suited in (3) that also discusses sodium hypochlorite?

    Response: Sections 12.3.15.B.(2) and 12.3.15.B.(3) have been revised as requested, and now read:

    (2.) Calcium hypochlorite is available in either granular form or in 5-g tablets and must contain approximately 65 percent available chlorine by weight. The material should be stored in a cool, dry and dark environment to minimize its deterioration. (CAUTION: Tablets dissolve in approximately 7 hours and must be given adequate contact time.)
    (3.) Sodium hypochlorite contains approximately 5 percent to 15 percent available chlorine, and the storage conditions and time must be controlled to minimize its deterioration. The chlorine-water solution shall be prepared by adding hypochlorite to water. Product deterioration shall be reckoned with in computing the quantity of sodium hypochlorite required for the desired concentration. Do not use sodium hypochlorite intended for swimming pool disinfection, as this material has been sequestered and is extremely difficult to remove from the pipe after the desired contact time has been achieved.

38. Comment: Section 4.2.01.G.: Insert a period at the end of the second to last sentence.

    Response: Corrected.

39. Comment: Section 4.2.01.G.1.: Insert a period at the end of the last sentence.

    Response: Corrected.

40. Comment: Sections 4.2.02.F-J.: Add periods after subsections (i.e. "F." instead of "F") for consistency.

    Response: Corrected.

41. Comment: Section 4.2.02.G.2a.: Recommend "Encase water main **in** polyethylene."

    Response: Corrected.

42. Comment: Section 4.2.02.G.2b.: Insert a period at the end.

    Response: Corrected.

43. Comment: Section 4.2.05.B.1.: Insert a period at the end.

    Response: Corrected.

44. Comment: Section 4.2.06.C.: Remove extra period at the end of the first sentence.

    Response: Corrected.

45. Comment: Sections 5.5.H-M.: Add periods after subsections (i.e. "H." instead of "H") for consistency.

    Response: Corrected.

46. Comment: Section 5.6.J.5.: Remove extra period at the end.

    Response: Corrected.

47. Comment: Section 5.7.B.: Add period after subsection (i.e. "B." instead of "B") for consistency.

    Response: Corrected.

48. Comment: Section 5.7.E.: Recommend "Drawings ***requiring*** clarifying construction details…"

    Response: Section 5.7.E has been revised as follows:

    "E. Drawings for pumping stations shall be drawn on a scale of not less than 1/4" equals 1' - 0". Drawings that require clarifying construction details shall be drawn on an appropriately larger scale."

49. Comment: Section 5.8.J.: Insert a period at the end.

    Response: Corrected.

50. Comment: Drawing D-180: For Note #2, recommend "They must be installed prior ***to*** tentative acceptance by the ***County***."

    Response: Note 2 has been revised as requested.

51. Comment: Drawing D-495-1: Correct spelling of lower detail to "2 ½" ***HOSE*** NOZZLE".

    Response: Corrected.

52. Comment: Drawing D-510: Recommend darkening shaded leader arrowheads.

    Response: The arrowheads have been darkened.

53. Comment: Drawing D-515: Recommend revising note near top to "Lid to be ***provided*** without hole or locking device."

    Response: This note has been revised as requested.

54. Comment: Drawing D-520-3: Note #7 references D-525-1, but there is only a D-525, which appears to be the appropriate reference.

    Response: Corrected to refer to D-525.

55. Comment: Drawing D-535-2: Recommend darkening shaded leaders and arrowheads.

    Response: The leaders and arrowheads have been darkened.

56. Comment: Drawing D-730: Insert a period at the end of Note #1.

    Response: Corrected.

57. Comment: Section 8.1.4.B.: Reinsert comma, as shown in former standards: "...established by the Engineer**,** and if any of the stakes..."

    Response: Revised as requested.

58. Comment: Section 8.1.4.C.: Insert a period at the end.

Response: Corrected.

59. Comment: Section 8.1.5.I.4.: Insert a period at the end.

Response: Corrected.

60. Comment: Section 8.1.5.I.5.: Insert a period at the end.

Response: Corrected.

61. Comment: Section 8.1.5.I.6.: Insert a period at the end.

Response: Corrected.

62. Comment: Detail D-490 (Air Release Detail) shows a large valve box for the ARV encasement. The large valve box apparently is not big enough, and a meter box (typically traffic-bearing) needs to be used.

Response: Drawing D-490 has been revised to refer to a traffic-rated meter box.

63. Comment: Section 12.2.4, which does not appear to have been changed during these revisions, states that the copper tubing is to be "hard drawn". Hard drawn pipe comes in lengths no longer than 20 feet, which most of the time would require joints / connections when the water main is on the opposite side of the road as the meter. The Standards also state that the service line is to be one continuous piece of pipe from the main to the meter setter, which would be impossible with hard drawn copper. You do not want to be drilling service lines with joints, either. Even though this has been in the standards, soft (bendable) copper service lines have been typically used. Let me know if you have any questions.

Response: Section 12.2.4 has been revised to refer to annealed copper tubing, as follows:

***"12.2.4** Copper tubing shall meet requirements of ASTM B88 for Type "L" copper, hard drawn, for above ground use and Type "K" hard drawn for below ground use. Copper tubing for direct burial shall meet the requirements of ASTM B88 for Type "K" copper, hard drawn, and annealed."*

64. Comment: Remove Tyrone Watkins contact information from Legal Agreement forms and instructions.

Response: Corrected.

65. Comment: In the Approved materials List, verify meter setter series and model numbers with requested requirements for discrepancies, i.e. bypass vs. no bypass on large meter setters.

    Response: Model numbers have been specified for 1-1/2" and 2" meter setters from Ford and Mueller. The specified models have no bypass and valves on the inlet and outlet.

66. Comment: In the Approved Materials List, verify head spacing of new meters (Badger) and coordinate with interior dimensions on approved boxes and vaults throughout the meter size range for both standard and traffic rated boxes.

    Response: The Approved Materials List has been revised such that the specified meter boxes should accommodate the new meters and ERTs.

67. Comment: Verify the availability and design of manhole frame and covers models listed, in particular the East Jordan Iron Works and Neenah Foundry models.

    Response: The approved models from each manufacturer meet our new requirements. Pricing and availability will be determined by the manufacturer and the supplier.

68. Comment: Verify the acceptability of Tindall manholes in accordance with the requirements of the new standards, i.e. bench construction and joint sealing method.

    Response: Tindall manholes are now approved for new construction.

69. Comment: To date we have shipped hundreds of the Oldcastle meter boxes as shown on the attached submittal. This box has a white interior and cast iron lid w/ reader access. We do not think it in the best interest of the County to limit meter boxes to only one Manufacturer as proposed in the new specifications and request this meter box be added as an additional approved product. (Note: Cut sheet for rectangular meter box included as attachment).

    Response: The DPU Product Review Committee has previously reviewed rectangular meter boxes and has not recommended approval.

70. Comment: For your review, I have attached a cut sheet for two gripper gaskets, (a method of restrained joint ductile iron).

    Response: These are included in the Approved Material List in Section 14.

71. Comment: I have attached the cut sheet for the Carson 1015 meter box. As mentioned, I feel like this is a durable, one piece meter box in which will work outstanding.

Response: No change has been made. This meter box is significantly smaller than the approved meter boxes on the Approved Materials List and does not provide sufficient space for installation or maintenance of the meter.

72. Comment: Add a table of contents for the document. Also, we request that you provide dividers for each section.

Response: DPU will offer the Standards in two different formats. A digital format will be available on our website for public use. A printed copy will be available for purchase at $75 per copy. This printed copy will include a table of contents and have a divider between sections.

73. Comment: Specify that hydrants, flushing devices, and chambers or pits containing valves, blow-offs, meters, air relief valves or other such appurtenances shall not be directly connected to any sewer or storm drains.

Response: Section 4.2.02.H. has been revised to include the requested items, as follows:

> *" H. Engineer shall refer to the Virginia Department of Health Waterworks Regulations and the Department's Cross Connection Control Manual for backflow requirements. Standard installation schematics are included in the Cross Connection Control Manual. Hydrants, flushing devices, and chambers or pits containing valves, blow-offs, meters, air relief valves or other such appurtenances shall not be directly connected to any sewer or storm drain."*

74. Comment: In chapter 4, include a reference to chapter 2 regarding the required separation of water mains and sewers.

Response: Section 4.2.01.H. has been added as follows:

> *"H. Separation between water mains and sanitary or combined sewers shall be in accordance with Section 2.2.09."*

75. Comment: Provide standards for the water mains crossing above and under the surface water.

Response: This item is already included as part of the Standards in Sections 4.2.06.E. and 4.2.06.F.

76. Comment: Specify that all water mains shall be disinfected prior to being placed in operation.

Response: Section 12.3.15. has been revised to require disinfection of all water mains prior to being placed in operation.

77. Comment: Specify that the final flushing after disinfection will be done using potable water.

Response: Section 12.3.15.E. has been revised as follows:

> *"E. Final flushing: After the applicable retention period the heavily chlorinated water shall be flushed using potable water from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than 1 mg/l. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline.*

78. Comment: For the bacteriological sampling after disinfection, state that the bacteriological samples collected on 2 consecutive days from each 1200-foot sections of water main shall show absence of total coliform bacteria.

Response: Section 12.3.14.F. has been revised to change the word "organisms" to "bacteria".

79. Comment: Drawing Nos. D710-730 show bedding details, but do not show C-1 bedding as required in section 10.3.5 and on form F-6.

Response: The Standard Drawings, Forms, and applicable sections of the Standards have been revised to match allowable bedding scenarios.

80. Comment: We recommend including the tables referenced in form F9.

Response: The tables referenced are copyrighted by ISO and we can not reproduce them in our Standards. The tables are provided on ISO's web site and in AWWA Manual M-31.