

Summary of 2008 Update to Sanitary Sewer Engineering Standards

1998 Sanitary Sewer Engineering Standards	2008 Sanitary Sewer Engineering Standards	Revision
Table of Contents, Chapter S2	Table of Contents, Chapter S2	Added Section S2-05 As-Built Documentation
Table of Contents, Chapter S4	Table of Contents, Chapter S4	Added Section S4-04 HDPE Pipe Specifications
Table of Contents, Sections S4-04 to S4-25	Table of Contents, Sections S4-04 to S4-26	Renumbered to accommodate inclusion of S4-04 HDPE Pipe Specs
Table of Contents, Section S4-06	Table of Contents, Section S4-06	Changed title to “Caps and Plugs”
Table of Contents, Chapter S5	Table of Contents, Chapter S5	Added Section S5-27 Trenchless Excavation Specifications
Chapter S1, Section S1-02, “Standard Specifications”	Chapter S1, Section S1-02, “Standard Specifications”	Changed WSDOT version from 1998 to latest edition
Chapter S2, Section S2-04.1	Chapter S2, Section S2-04.1	Added developers will provide As-built drawings
Chapter S2, Section S2-04.2	Chapter S2, Section S2-04.2	Changed digital media type from floppy/Zip disk to CD-ROM.
Chapter S2, Section S2-04.3, General Note #1	Chapter S2, Section S2-04.3, General Note #1	Added “the 2008” to COB Utility Engineering Standards
Chapter S2, Section S2-04.3, General Note #3	Chapter S2, Section S2-04.3, General Note #3	Updated specs for PVC pipe
Chapter S2, Section S2-04.3, General Note #5	Chapter S2, Section S2-04.3, General Note #5	Added “unless otherwise noted”.
Chapter S2, Section S2-04.3, General Note #8	Chapter S2, Section S2-04.3, General Note #8	Replaced “plug” with “cap”
Chapter S2, Section S2-04.3, General Note #9	Chapter S2, Section S2-04.3, General Note #9	Added notify Engineer if a conflict exists
Chapter S2, Section S2-04.3, General Note #16	Chapter S2, Section S2-04.3, General Note #16	Replaced “survey” with “surveyor licensed in WA”
Chapter S2, Section S2-04.3, General Note #28	Chapter S2, Section S2-04.3, General Note #28	Changed 48 hours to 72 hours, added new phone number, “811”
Chapter S2, Section S2-04.3	Chapter S2, Section S2-04.3, General Note #29	Added confined space description and entry permit requirement
Chapter S2, Section S2-04.3	Chapter S2, Section S2-04.3, General Note #30	Added Contractor provides DVD or VHS of sewer pipe
Chapter S2, Section S2-04.3	Chapter S2, Section S2-04.3, General Note #31	Added Contractor provides written notification to property owner(s) and Bellevue Utilities 48 hours before entering public utility easement
Chapter S2, Section S2-04.3	Chapter S2, Section S2-04.3, General Note #32	Added Contractor restores Right-of-Way and easement condition to equal or better than condition prior to construction, and obtain signed release from all affected property owners.

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Chapter S2	Chapter S2, Section S2-05	Added Section S2-05 As-Built requirements
Chapter S3	Chapter S3, Section S3-02, General Design Standards	Added Item I, placement of appurtenance lids
Chapter S3	Chapter S3, Section S3-02, General Design Standards	Added Item J, sewer pipe shall not be used for electrical grounding
Chapter S3	Chapter S3, Section S3-02, General Design Standards	Added Item K, requirements for soil nail placement
Chapter S3, Section S3-04, Item B	Chapter S3, Section S3-04, Item B	Deleted “in”, added “and” before easements
Chapter S3, Section S3-04, Item C	Chapter S3, Section S3-04, Item C	Deleted “in easement areas”
Chapter S3, Section S3-04, Item F	Chapter S3, Section S3-04, Item F	Added specs for sewer main slopes greater than 0.1 ft/ft.
Chapter S3, Section S3-04, Item G	Chapter S3, Section S3-04, Item G	Changed “8-inch diam.” to “up”; Added “and hydraulic concerns” for other pipe configurations
Chapter S3, Section S3-04, Item K	Chapter S3, Section S3-04, Item K	Added Standard Detail numbers in “Comments” column
Chapter S3, Section S3-04	Chapter S3, Section S3-04, Item O	Added burial of manholes and cleanouts is prohibited
Chapter S3, Section S3-04	Chapter S3, Section S3-04, Item P	Added specs for level grade around manholes in easements
Chapter S3, Section S3-05, Item A	Chapter S3, Section S3-05, Item A	Updated PVC pipe ASTM standards; Added “including side sewer stubs”; Deleted “or less” for dimension ratio
Chapter S3, Section S3-05, Item B	Chapter S3, Section S3-05, Item B	Changed PVC encasement under walls from 5 feet to 4 feet high
Chapter S3, Section S3-07, Item E	Chapter S3, Section S3-07, Item E	Changed threshold for upgrading manhole
Chapter S3, Section S3-08.1	Chapter S3, Section S3-08.1	Added “non-biodegradable cutting” to petroleum oils
Chapter S3, Section S3-08.1, Item F	Chapter S3, Section S3-08.1, Item F	Deleted minimum 18 inch drop, added “as shown in Standard Details”
Chapter S3, Section S3-08.2	Chapter S3, Section S3-08.2	Changed “various” to “the”
Chapter S3, Section S3-08.2, Item A	Chapter S3, Section S3-08.2, Item A	Replaced “Uniform Plumbing Code” with “Standard Details”, added Grease Interceptor size will be determined by COB F.O.G. Administrator.
Chapter S3, Section S3-10, Item E	Chapter S3, Section S3-10, Item E	Changed “plug” to “cap”, “plugged” to “capped”
Chapter S4, Section S4-06	Chapter S4, Section S4-07	Changed title to “Caps and Plugs”, changed “material” to “cap”

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Chapter S4, Section S4-13	Chapter S4, Section S4-14	Updated ASTM specs for cast iron
Chapter S4, Section S4-17	Chapter S4, Section S4-18	Changed “class C” to “3000 psi”; Deleted “concrete” for sampling tee enclosure
Chapter S4, Section S4-21	Chapter S4, Section S4-22	Changed reference to 9-03.12(3) “Gravel Backfill for Pipe Zone Bedding”
Chapter S4, Section S4-22	Chapter S4, Section S4-23	Updated specs for carrier pipe
Chapter S5, Sections S5-27 to S5-39	Chapter S5, Sections S5-27 to S5-40	Renumbered to accommodate inclusion of S5-27 Trenchless Excavation
Chapter S5, Section S5-04	Chapter S5, Section S5-04	Addition of requirements for soil nail placement
Chapter S5, Section S5-08	Chapter S5, Section S5-08	Updated pipe bedding specs
Chapter S5, Section S5-09	Chapter S5, Section S5-09	Addition of marking distance between main and stub, Changed “plugged” to “capped”.
Chapter S5, Section S5-10	Chapter S5, Section S5-10	Added specs for grade around manholes in easements Updated specs for manholes in public right-of way. Updated specs for channel sides.
Chapter S5, Section S5-18	Chapter S5, Section S5-18	Changed “cast concrete meter box” to “casting or meter box” Changed “class C concrete” to “3000 psi cement concrete”
Chapter S5, Section S5-21	Chapter S5, Section S5-21	Changed preconstruction photo size from 5”x 7” to 4”x 6”
Chapter S5, Section S5-26	Chapter S5, Section S5-26	Addition of trench/excavation protection specs
Chapter S5	Chapter S5, Section S5-27	Addition of Section S5-27 Trenchless Excavation
Chapter S5, Section S5-27	Chapter S5, Section S5-28	Addition of other shoring regulations
Chapter S5, Section S5-29, Item C	Chapter S5, Section S5-30, Item C	Updated specs for crushed surfacing backfill and compaction, Changed reference for compaction and moisture control tests for both paved and unimproved areas.
Chapter S5, Section S5-31.2	Chapter S5, Section S5-32.2	Deleted the word “current”, updated the reference to Section 7-05.3(2)
Chapter S6, Section S6-08.2, Item A	Chapter S6, Section S6-08.2, Item A	Changed cleanout requirements
Chapter S6, Section S6-08.2, Item B	Chapter S6, Section S6-08.2, Item B	Changed distance between cleanout and building

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Chapter S6, Section S6-08.2, Item G	Chapter S6, Section S6-08.2, Item G	Changed cleanout extension
Chapter S6, Section S6-10.1	Chapter S6, Section S6-10.1	Changed title to “Sewer Taps”, added phrase “City-owned”, deleted phrase, “to main lines”, changed “cut-in” to “sewer tap”.
Chapter S6, Section S6-14.4	Chapter S6, Section S6-14.4	Several changes regarding lakeline connections and hydraulic grade line– please refer to 2008 San. Sewer Eng. Standards
Chapter S6, Section S6-14.5	Chapter S6, Section S6-14.5	Deleted title, “Hydraulic Gradient”, changed “Uniform” to “International”, inserted all text into next section.
Chapter S6, Section S6-14.6	Chapter S6, Section S6-14.5	Inserted text from previous section, deleted phrase, “a backwater valve is required”, changed “save” to “hold”.
Chapter S6, Section S6-14.7	Chapter S6, Section S6-14.6	Renumbered to accommodate deletion of Hydraulic Gradient section
Chapter S6, Section S6-15	Chapter S6, Section S6-15	Addition of determination of side sewer condition by Engineering Technician.
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-2, Outside Drop Structure, to S-4
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-3, Inside Drop Structure, to S-5
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-4, Standard Manhole Under 5 Feet Deep, to S-6, Manhole Under 5 Feet Deep
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-5, Manhole Adjustment Detail, to S-8
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-6, 24” Manhole Ring and Cover, to S-11
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-7, 24” Bolt-Locking Manhole Ring & Cover, to S-12
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-8, Ladder and Manhole Step, to S-13
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-9, Typical Trench Detail, to S-14
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-10, Pipe Bedding, to S-15
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-11, Cleanout, to S-16, Cleanout (at grade)
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-12, Side Sewer Stubs, to S-17
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-13, House Sewer Connection, to S-18

1998 Sanitary Sewer Engineering Standards	2008 Sanitary Sewer Engineering Standards	Revision
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-14, Soil/Cement Pipe Anchor, to S-19
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-15, Timber Baffle/Hill Holder, to S-22
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-16, Lake Line Cleanout and Check Valve Assembly Installation, to S-23
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-17, Lake Line Cleanout and Check Valve Assembly Installation at or Below Hydraulic Gradient, to S-24
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-18, Side Sewer Cleanout For Lakeline Connections, to S-25
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-19, Check Valve Assembly For Joint Use Side Sewer (4" to 8" Diameter), to S-26
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-20, Sampling Tee, to S-27
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-21, 100 Gallon Baffle Type Oil/Water Separator, to S-28
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-22, 450 Gallon Baffle Type Oil/Water Separator, to S-29
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-23, 800 & 1000 Gallon Baffle Type Oil/Water Separator, to S-30
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-24, Grease Interceptor, to S-31
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-25, Uncovered Paved Vehicle Service Area Drainage Detail, to S-32
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-26, Casing Installation, to S-33
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-27, New Manhole on Existing Sewer, to S-7
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-28, Manhole Section Adjustment, to S-9
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-29, Manhole Type 2 – 72" and 96", to S-2
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Changed Detail S-30, Manhole Type 3 – 72" and 96", to S-3
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Added Detail S-34, Single Home Sewer Pump System

1998 Sanitary Sewer Engineering Standards	2008 Sanitary Sewer Engineering Standards	Revision
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Added Detail S-10, Sewer Manhole Adjustment (Concentric to Eccentric Cone)
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Added Detail S-20, Pipe Stake Anchor Assembly
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Added Detail S-21, Side Sewer Relocation
Appendix S-1, Table of Contents	Appendix S-1, Table of Contents	Added Detail S-35, Project Sign Detail
Standard Detail S-1, Standard Manhole	Standard Detail S-1, Standard Manhole	<ul style="list-style-type: none"> • Revision to leveling ring notes and dimensions • Require Kor-n-Seal connector or equal • Channel walls now vertical and full height of largest pipe • General Note 2 – safety ladder grouted <u>or bolted</u> in place • Added General Note 11 – grout all joints inside and out for watertight construction. • Added General Note 12 – provide level ground (2.5’ radius min) around manholes in easements. • Other minor revisions.
Standard Detail S-2, Outside Drop Structure	Standard Detail S-4, Outside Drop Structure	<ul style="list-style-type: none"> • Renumbered S-4 • Maximum entry angle of pipe now 20%. • Require Romac coupling at drop connection to upstream pipe. • Require CDF backfill at drop piping. • Push-on cap requires cut out window at drop tee. Added drawing to clarify. • Require core drill and Kor-n-Seal connector for pipe penetrations. • Require full-height channels. • Other minor revisions.

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Standard Detail S-3, Inside Drop Structure	Standard Detail S-5, Inside Drop Structure	<ul style="list-style-type: none"> • Renumbered S-5 • Maximum entry angle of pipe now 20% • Require Romac coupling at drop connection to upstream pipe. • Push on cap requires cut out window at drop tee. Added drawing to clarify. • Require core drill and Kor-n-Seal connector for pipe penetrations. • Require full-height channels. • Other minor revisions.
Standard Detail S-4, Standard Manhole Under 5' Deep	Standard Detail S-6, Manhole Under 5' Deep	<ul style="list-style-type: none"> • Renumbered S-6 • Revision to leveling ring notes and dimensions • Require Kor-n-Seal connector or equal. • Channel walls now vertical and full height of largest pipe. • Other minor revisions
Standard Detail S-5, Manhole Adjustment Detail	Standard Detail S-8, Manhole Adjustment Detail	<ul style="list-style-type: none"> • Renumbered S-8 • Deleted Note 1 regarding addition of barrel sections (now covered by new Detail S-10) • Other minor revisions
Standard Detail	Standard Detail S-10, Sewer Manhole Adjustment (Concentric to Eccentric)	New Sewer Detail – replaces Note 1 from old Detail S-5.
Standard Detail S-6, 24" Manhole Ring & Cover	Standard Detail S-11, 24" Manhole Ring & Cover	<ul style="list-style-type: none"> • Renumbered S-11 • Ring and cover ductile iron with ASTM spec. • Rated for HS-20 load • Added Olympic Foundry Model number. • Other minor revisions
Standard Detail S-7, 24" Bolt-Locking Manhole Ring & Cover	Standard Detail S-12, 24" Bolt-Locking Manhole Ring & Cover	<ul style="list-style-type: none"> • Renumbered S-12 • Ring and cover ductile iron with ASTM spec. • Rated for HS-20 load • Added Olympic Foundry Model number. • Other minor revisions

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Standard Detail S-8, Ladder & Manhole Step	Standard Detail S-13, Ladder & Manhole Step	<ul style="list-style-type: none"> • Renumbered S-13 • Other minor revisions
Standard Detail S-9, Typical Trench Detail	Standard Detail S-14, Typical Trench Detail	<ul style="list-style-type: none"> • Renumbered S-14 • Modified WSDOT Standard Spec reference numbers • Other minor revisions
Standard Detail S-10, Pipe Bedding	Standard Detail S-15, Pipe Bedding	<ul style="list-style-type: none"> • Renumbered S-15 • Changed Flexible Pipe bedding specs • Other minor revisions
Standard Detail S-11, Cleanout	Standard Detail S-16, Cleanout (At Grade)	<ul style="list-style-type: none"> • Renumbered S-16 • Added location – 36” min. from building wall. • Rated HS-20. • Specified encasement of ring and cover in 3,000 psi concrete. • Added table with dimensions for 4”, 6”, and 8” cleanout features • Revised cover to read “SEWER CO” and “DO NOT BURY” • Added “(At Grade)” to detail title • Other minor revisions
Standard Detail S-12, Side Sewer Stubs	Standard Detail S-17, Side Sewer Stubs	<ul style="list-style-type: none"> • Renumbered S-17 • Drawing shows right-of-way line • Added “distance to main” on 2x4 stake information • Changed “plug” to “cap” • Added more detail on pipe bedding • Other minor revisions
Standard Detail S-13, House Sewer Connection	Standard Detail S-18, House Sewer Connection	<ul style="list-style-type: none"> • Renumbered S-18 • Revised cleanout at building to be “CO to grade” • Refer to new S-16 for cleanout details • Called for coupling at building to be Fernco, or equal • 6”x 4” reducer to be hard piped (no flexible coupling) • Other minor revisions

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Standard Detail S-14, Soil/Cement Pipe Anchor	Standard Detail S-19, Soil/Cement Pipe Anchor	<ul style="list-style-type: none"> • Renumbered S-19 • Addition of pipe clamp locations and Note 2 regarding pipe clamp • Other minor revisions
Standard Detail	Standard Detail S-20, Pipe Stake Anchor Assembly	New Sewer Detail – please refer to 2008 Standard Detail S-20
Standard Detail	Standard Detail S-21, Side Sewer Relocation	New Sewer Detail – please refer to 2008 Standard Detail S-21. Use this detail when changing vertical alignment of side sewer.
Standard Detail S-15, Timber Baffle/Hill Holder	Standard Detail S-22, Timber Baffle/Hill Holder	<ul style="list-style-type: none"> • Renumbered S-22 • Other minor revisions
Standard Detail S-16, Lake Line Cleanout & Check Valve Assembly Installation	Standard Detail S-23 Lake Line Cleanout & Check Valve Assembly Installation	<ul style="list-style-type: none"> • Renumbered S-23 • Added cleanout to grade at buildings and downstream of joint-use side sewer check valve. • Specified 6” minimum size for lakeline stub. • Specified 6”x 6” wye at branch to houses. • Revised detail to reflect new rules regarding installation of backflow protection for lakeline hydraulic grade line. • Other minor revisions
Standard Detail S-17, Lake Line Cleanout & Check Valve Assembly Installation At Or Below Hydraulic Gradient	Standard Detail S-24, Lake Line Cleanout & Check Valve Assembly Installation At Or Below Hydraulic Gradient	<ul style="list-style-type: none"> • Renumbered S-24 • Added cleanout to grade at buildings. • Revised location of joint-use side sewer cleanout to be closer to gravity house connection. Added cleanout to grade just downstream of check valve. • 6”x Forcemain reducer to be hard piped (no flexible coupling). • Specified 6”x 6” wye at branch to houses • Added note that pump shall not be connected to septic tank • Revised detail to reflect new rules regarding installation of backflow protection for lakeline hydraulic grade line. • Other minor revisions

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Standard Detail S-18, Side Sewer Cleanout For Lake Line Connections	Standard Detail S-25, Side Sewer Cleanout For Lake Line Connections	<ul style="list-style-type: none"> • Renumbered S-25 • Added Note 3 which calls for cover to read “SEWER CO” and “DO NOT BURY”. • Replaced “SIDU” mechanical sewer plug with “All plastic” mechanical sewer plug. • Replaced Fog-Tite concrete meter box with Olympic Foundry metal meter box. • Other minor revisions
Standard Detail S-19, Check Valve Assembly For Joint Use Side Sewer (4” to 8” Diameter)	Standard Detail S-26, Check Valve Assembly For Joint Use Side Sewer (4” to 8” Diameter)	<ul style="list-style-type: none"> • Renumbered S-26 • Specified Romac couplings • Replaced Fog-Tite concrete meter box with Mid-States Plastics box (for valve chamber less than 3 feet deep). • Other minor revisions
Standard Detail S-20, Sampling Tee	Standard Detail S-27, Sampling Tee	<ul style="list-style-type: none"> • Renumbered S-27 • For sampling tee located in non-traveled areas, change Fog-Tite concrete meter box to Mid-States Plastics box. • Other minor revisions
Standard Detail S-21, 100 Gallon Baffle Type Oil/Water Separator	Standard Detail S-28, 100 Gallon Baffle Type Oil/Water Separator	<ul style="list-style-type: none"> • Renumbered S-28 • Change hatch to read “SEWER” instead of “OIL/WATER”. • Revised drawing to show inlet pipe on left and outlet on right. • Require inlet pipe invert to be 3” minimum above outlet invert • Add gasketed cap to top of outlet tee. • Require Kor-n-Seal connectors for pipe penetrations. • Added Note 7 requiring that interior oil/water separators have venting per Uniform Plumbing Code. • Other minor revisions

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Standard Detail S-22, 450 Gallon Baffle Type Oil/Water Separator	Standard Detail S-29, 450 Gallon Baffle Type Oil/Water Separator	<ul style="list-style-type: none"> • Renumbered S-29 • Outlet tee to extend 18” <u>minimum</u> below water surface. • Change hatch to read “SEWER” instead of “OIL/WATER”. • Revised drawing to show inlet pipe on left and outlet on right. • Add gasketed cap to top of outlet tee. • Require Kor-n-Seal connectors for pipe penetrations. • Added Note 7 requiring that interior oil/water separators have venting per Uniform Plumbing Code. • Other minor revisions
Standard Detail S-23, 800 & 1000 Gallon Baffle Type Oil/Water Separator	Standard Detail S-30, 800 & 1000 Gallon Baffle Type Oil/Water Separator	<ul style="list-style-type: none"> • Renumbered S-30 • Outlet tee to extend 18” <u>minimum</u> below water surface. • Change hatch to read “SEWER” instead of “OIL/WATER”. • Revised drawing to show inlet pipe on left and outlet on right. • Add gasketed cap to top of outlet tee. • Require Kor-n-Seal connectors for pipe penetrations. • Added Note 7 requiring that interior oil/water separators have venting per Uniform Plumbing Code. • Other minor revisions
Standard Detail S-24, Grease Interceptor	Standard Detail S-31, Grease Interceptor	<ul style="list-style-type: none"> • Renumbered S-31 • Replace “flexible coupling” with “Romac 501”. • Add cap to top of outlet tee. • Add stainless steel strap and 5/8” bolt to secure inlet tee to vault wall. • Inlet pipe invert to be 3” minimum above outlet invert. • Require Kor-n-Seal connectors at pipe penetrations. • Added Note 14 requiring outlet tee cap to be gasketed. • Other minor revisions
Standard Detail S-25, Uncovered Paved Vehicle Service Area Drainage Detail	Standard Detail S-32, Uncovered Paved Vehicle Service Area Drainage Detail	<ul style="list-style-type: none"> • Renumbered S-32 • Renumbered references to other Standard Details • Added “Type 1” to Catch Basins • Other minor revisions

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Standard Detail S-26, Casing Installation	Standard Detail S-33, Casing Installation	<ul style="list-style-type: none"> • Renumbered S-33 • Other minor revisions
Standard Detail S-27, New Manhole On Existing Sewer	Standard Detail S-7, New Manhole On Existing Sewer	<ul style="list-style-type: none"> • Renumbered S-7 • Major revision is to eliminate “saddle manhole” connection. New manhole shall be connected to existing sewer line by cutting into existing pipe and connecting manhole and PVC pipe stubs to existing pipe with Romac couplings. • Require vertical channel walls to be full height up to the top of highest pipe crown in the manhole. • Require Kor-n-Seal connector at pipe penetrations. • Invert of new sewer shall be at springline of existing sewer. • If new sewer is a side sewer, new invert shall be at or above existing sewer crown, but maximum 18” above invert of existing (main) sewer. • Channel shall be 3,000 psi concrete • Angle of entry for new sewer shall be 90° or less from existing line. • Other minor revisions
Standard Detail S-28, Manhole Section Adjustment	Standard Detail S-9, Manhole Section Adjustment	<ul style="list-style-type: none"> • Renumbered S-9 • Added existing soil with concrete collar cast up against side of excavation. • Collar thickness shall be 12” minimum. • If necessary, “<u>cut</u>” instead of “break” key at bottom of new barrel section. • Grout inside joint seam, leaving no goiters. • Added Note 3, requiring grouting of all joints inside and out to achieve watertight construction. • Other minor revisions

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Standard Detail S-29, Manhole Type 2, 72" and 96"	Standard Detail S-2, Manhole Type 2, 72" and 96"	<ul style="list-style-type: none"> • Renumbered S-2 • Revised grade ring dimensions. • Require 6' minimum headroom in lowest barrel section. • Channels shall be vertical and full height of largest diameter pipe. • Slope channel top shelf at 2% minimum. • Added Note 9, requiring grouting of all joints inside and out to achieve watertight construction. • Other minor revisions
Standard Detail S-30, Manhole Type 3, 72" and 96"	Standard Detail S-3, Manhole Type 3, 72" and 96"	<ul style="list-style-type: none"> • Renumbered S-3 • Revised grade ring dimensions • Channels shall be vertical and full height of largest diameter pipe. • Removed maximum height limitation for manhole Type 3. • Added Note 10, requiring grouting of all joints inside and out to achieve watertight construction. • Other minor revisions
Standard Detail	Standard Detail S-34, Single Home Sewer Pump System	New Sewer Detail – please refer to 2008 Standard Detail S-34
Standard Detail	Standard Detail S-35, Project Sign Detail	New Sewer Detail – please refer to 2008 Standard Detail S-35
Appendix S-4, Joint Restraint Systems	Appendix S-4, Joint Restraint Systems	Added 600 Series, RomaGrip to Romac (Grip Ring)
Appendix S-4, Couplings	Appendix S-4, Couplings	Added 400 and 501 Series to Romac
Appendix S-4	Appendix S-4, Meter Boxes	Added specs for cleanout service and valve chamber
Appendix S-4, Mechanical Sewer Plugs	Appendix S-4, Mechanical Sewer Plugs	Added Graham Hand Tite (Plastic)