

## **SIGNIFICANT CHANGES IN CDOT's 2017 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION**

The following are significant changes from the 2011 Standard Specifications Book to the new 2017 Standard Specifications Book. Most of the changes were previously adopted by CDOT's Specification Committee as standard special provisions and have been applicable to projects put under construction since their adoption.

The following general changes have been made:

- The term Quality Control has been changed to Process Control throughout to match federal terminology.
- Some subsections in Sections 105 and 106 were rewritten to establish proper process control and testing requirements for both concrete and asphalt pavements.
- Significant changes were made to the requirements for earthwork and structure backfill.
- The use of micro-fiber reinforced concrete has been implemented for certain elements of construction.
- The use of maturity meters has been implemented for determining concrete strength for removal of forms and falsework, loading of piers and abutments, opening of bridge decks and concrete pavement to traffic, and backfilling structures.
- The Manual for Assessing Safety Hardware (MASH) has been implemented for determining the acceptability of traffic control devices.

The following Sections of the Specification Book contain significant revisions [there are less significant changes that are not listed]:

### **Significant Changes to the 2017 Standard Specifications**

<b>Specification Sections with Significant Changes</b>	<b>What was Changed (by Subsection Number)</b>
101 – <i>Definitions and Terms</i>	101.01: Added the abbreviations: MASH - Manual for Assessing Safety Hardware and MS4 - Municipal Separate Storm Sewer System.
102 – <i>Bidding Requirements and Conditions</i>	102.02: Revised subsection to require bids on CDOT construction projects to be submitted electronically.
105 – <i>Control of Work</i>	105.03: Added testing of reflectivity of modified epoxy pavement marking for acceptance or price adjustment. 105.03: Incorporated the price adjustment for violation of working time limitations.
	105.06: Revised the requirements for acceptance or price adjustment of concrete pavement.
	105.07: Rewrote subsection to base acceptance or price adjustment of hot mix asphalt smoothness on the mean roughness index rather than the half-car roughness index.
	105.08: Rewrote subsection to base acceptance or price adjustment of concrete pavement smoothness on the mean roughness index rather than the half-car roughness index.
	105.22, 105.23, & 105.24: Made improvements to the process for resolving conflicts on construction projects.

Specification Sections with Significant Changes	What was Changed (by Subsection Number)
106 – <i>Control of Material</i>	106.05: Revised the Mix Verification Testing requirements for hot mix asphalt.
	106.06: Made several revisions to the requirements for sampling and testing of Portland cement concrete pavement.
	106.11(a): Added Contractor documentation to Buy America Requirements for iron and steel.
	106.11(b): Added Buy America requirements for glass beads used in pavement marking.
107 – <i>Legal Relations and Responsibility to Public</i>	107.25: Revised entire subsection to meet current water quality control requirements and conform to current practice. It includes the requirements for obtaining a Stormwater Construction Permit.
108 – <i>Prosecution and Progress</i>	108.01: Revised how the percentage of the work that the Contractor will be allowed to sublet is to be determined.
	108.03: Made major changes to the project schedule that the Contractor must submit and update regularly.
	108.08(c): Revised subsection to more clearly define the various types of delays in construction and who is responsible for them.
	108.08(d): Rewrote subsection to revise how the validity of the Contractor's request for an extension of contract time is determined.
109 – <i>Measurement and Payment</i>	109.06(h): Added this subsection to require the Contractor to report payments to subcontractors and to report payments withheld when the Contractor has "good cause" to withhold payment.
	109.06(i): Added this subsection which provides for adjustments in payment to the Contractor based on changes in fuel costs.
	109.06(j): Added this subsection which provides for adjustments in payment to the Contractor for asphalt pavement based on changes in asphalt cement costs.
	109.06(k): Added this subsection to limit partial payments to the encumbrance amount.
202 – <i>Removal of Structures and Obstructions</i>	202.05: Added specific requirements for removal of temporary pavement marking.
203 – <i>Excavation and Embankment</i>	203: Rewrote and reorganized entire <i>Excavation and Embankment</i> section.
206 – <i>Excavation and Backfill for Structures</i>	206.02(a): Revised the material requirements for Structure Backfill Classes (1) and (2), and Structure Backfill (Flow-Fill). Added chemical requirements for imported structure backfill.
	206.03: Added detailed construction requirements for Structure Backfill (Flow-Fill).
208 – <i>Erosion Control</i>	208: Revised entire section to include new erosion control features and materials, and to conform to current practice.

Specification Sections with Significant Changes	What was Changed (by Subsection Number)
212 – <i>Seeding, Fertilizer, Soil Conditioner, and Sodding</i>	212.02(a): Incorporated additional requirements for the quality of seed provided.
213 - <i>Mulching</i>	213.02: Added several products and updated the requirements for others.
	213.03: Revised the construction requirements for spray-on mulch blanket and added the requirements for bonded fiber matrices.
216 – <i>Soil Retention Covering</i>	216: Revised most of this section to include more detailed materials and construction requirements and to add a new material.
250 – <i>Environmental, Health, and Safety Management</i>	250: Replaced entire section to incorporate major changes throughout.
304 – Aggregate Base Course	304.06: Updated compaction requirements. Added compaction requirements for reclaimed asphalt pavement used for aggregate base course.
401 – <i>Plant Mix Pavements General</i>	401.10: Added requirements for equipment to construct a safety edge.
	401.17: Added compaction requirements for stone matrix asphalt pavement.
	401.18: Added requirement for a demonstration strip for stone matrix asphalt pavement.
409 – <i>Chip Seal</i>	409: Replaced entire section (formerly <i>Seal Coat</i> ) with the requirements for chip seals (the type of seal coat commonly used on CDOT projects).
412 – <i>Portland Cement Concrete Pavement</i>	412.07: Added requirements for equipment to construct a safety edge. Deleted the requirement for tining equipment.
	412.10: Added specification for equipment to test dowel bar placement.
	412.12(a): Revised the requirements for hand finishing of concrete pavement.
	412.12(c): Revised the requirements for final finishing of concrete pavement. Replaced requirements for tining with texturing by diamond grinding.
	412.13: Several changes were made to the construction requirements for joints in the concrete pavement.
	412.14: Revised the curing requirements for concrete pavement.
	412.22: Rewrote subsection to require strength for opening pavement to traffic to be determined by use of maturity meters.
504 – <i>Walls</i>	504: Replaced entire section (formerly <i>Cribbing</i> ) with the requirements for Concrete Panel Facing Mechanically Stabilized Earth Walls.
507 – <i>Slope and Ditch Paving</i>	507.02: Revised this subsection to require concrete slope and ditch paving to be constructed of macro-fiber reinforced Concrete Class B.
508 – <i>Treated Timber</i>	508: Updated the requirements for preservative treatment of timber throughout the section.

Specification Sections with Significant Changes	What was Changed (by Subsection Number)
510 – <i>Structural Plate Structures</i>	510.03: Updated the requirements for forming and punching the steel plates.
512- <i>Bearing Device</i>	512.09: Updated requirements for Engineer's accessibility to the manufacturer's bearing testing facilities.
518 – <i>Waterstops and Expansion Devices</i>	518.04 and 518.05: Revised subsections to require all structural steel in expansion devices to be galvanized.
601 – <i>Structural Concrete</i>	601: Added specifications for high-reactivity pozzolans at appropriate locations throughout the section.
	601.02: Revised the materials requirements for Concrete Classes E, H, HT, and P. Added the concept of optimized gradations and specified the conditions under which their use would be allowed.
	601.03: Added the requirements for fiber-reinforced concrete.
	601.04: Updated the requirements for the various classes of sulfate resistance.
	601.05: Revised the proportioning requirements for Concrete Classes E and P. Added proportioning requirements for optimized gradations. Updated the requirements for use of fly ash, silica fume, or pozzolans.
	601.06: Revised batching requirements to address use of pozzolans and OG gradations.
	601.07: Revised the general mixing requirements for concrete.
	601.09: Revised requirements for removal of forms. Determination of concrete compressive strength for removal will be made using maturity meters.
	601.11: Revised requirements for removal of falsework. Determination of concrete compressive strength for removal will be made using maturity meters.
	601.12(a): Added detailed specifications for hand finishing of concrete.
	601.12(l): Revised compressive strength determination for loading piers and abutments to be made by use of maturity meters.
	601.12(m): Revised compressive strength determination for opening structures to traffic to be made by use of maturity meters.
	601.13: Revised compressive strength determination to be made by use of maturity meters.
	601.15(b): Revised the requirements for the concrete bridge deck test slab.
	601.15(c): Revised the requirements for placing concrete in bridge decks.
	601.16: Revised the requirements for curing concrete bridge decks.

Specification Sections with Significant Changes	What was Changed (by Subsection Number)
	601.17: Modified the provisions for determining acceptance of the concrete and the application of pay factors.
603 – Culverts and Sewers	603.07: Added requirement for all systems to be watertight.
	603.10: Added this subsection for deflection testing of metal and concrete pipe.
606 – Guardrail	606.02: Added requirement for concrete bridge rail to be constructed with macro-fiber reinforced Class D concrete.
613 – Lighting	613.02(e) and 613.02(i): Revised specifications to require luminaires to be LEDs.
	613.02(j) and 613.02(k): Added requirements for a manufacturer's warranty on the LEDs and for technical support.
	613.07: Added more detailed requirements for backfilling trenches.
614 – Traffic Control Devices	614.04: Revised the requirements for sign panel manufacturing.
	614.08(f) Added requirements for pedestrian push button assemblies.
618 – Prestressed Concrete	618: Replaced entire section due to the large number of revisions.
624: Drainage Pipe	624.02: Added new types of pipe to the materials list. Updated materials requirements for connecting bands, end sections, and pipe extensions. Updated Table 624-1 to include new types of pipe. Added requirement for joint systems to be watertight.
	624.05: Added installation requirements for Aluminized Corrugated Steel Pipe.
627 – Pavement Marking	627.02: Replaced Epoxy Pavement Marking Material with Modified Epoxy Pavement Marking Material.
	627.04: Replaced waterborne and low volatile organic compound solvent base paint with low temperature acrylic paint and high build acrylic paint. Modified the application requirements.
	627.05: Replaced epoxy pavement marking with modified epoxy pavement marking and modified the placement requirements.
	627.08: Modified the replacement requirements for preformed plastic pavement marking.
	627.13: Updated the pay items for certain types of pavement marking.
630 – Construction Zone Traffic Control.	630: Added requirement for devices to meet MASH specifications throughout the section.
	630.01: Updated the list of traffic control items covered by this section.
	630.02: Updated retroreflective sheeting requirements for certain signs.

Specification Sections with Significant Changes	What was Changed (by Subsection Number)
	630.07(c): Added the material requirements for temporary portable rumble strips.
	630.15: Added construction requirements for emergency pull-off areas.
	630.16: Added construction requirements for temporary portable rumble strips.
701 – <i>Hydraulic Cement</i>	701.01: Updated the requirements for several types of cement. Deleted the requirement for project-specific CTRs.
	701.02: Revised fly ash requirements to allow blending of pozzolans.
	701.03: Deleted the requirement for project-specific CTRs.
	701.04: Added the requirements for high-reactivity pozzolans.
702 – <i>Bituminous Materials</i>	702: Subsections 702.02 through 702.06 have been revised and reorganized. The requirements now appear as subsections 702.02 through 702.04.
	702.02: This subsection now contains the requirements for emulsions for tack and fog coats, chip seals, slurry seals and micro-surfacing, prime coat, recycling agents, and asphalt rejuvenation agents.
	702.03: This subsection is unused.
	702.04: This section contains the requirements for hot poured joint and crack sealant.
703 - <i>Aggregates</i>	703.00: Deleted the table named "Definition of Nominal Aggregates".
	703.01 and 703.02: Modified the requirements for fine and coarse aggregates for concrete.
	703.03: Added the requirements for Aggregate Base Course (RAP).
	703.04: Added aggregate requirements for Hot Mix Asphalt Gradings SF and ST. Added requirements for resistance to coarse aggregate degradation for hot mix asphalt and stone matrix asphalt.
	703.05: Added a limitation on the amount of flat and elongated aggregate in cover coat material. Revised the percent passing the #200 sieve in Table 703-7.
	703.06: Added requirements for mineral filler used in stone matrix asphalts.
705 – <i>Joint, Waterproofing, and Bearing Materials</i>	705.02: Added this subsection for watertight joint systems.
	705.03: Revised the reference specification for gaskets.
707 – <i>Metal Pipe</i>	707.11: Added the requirements for Aluminized Corrugated Steel Pipe Type 2.
708 - <i>Paints</i>	708.05: Revised the materials used for pavement marking paint.

Specification Sections with Significant Changes	What was Changed (by Subsection Number)
709 – Reinforcing Steel and Wire Rope	709.01: Revised the reference specification for epoxy coated reinforcing bars.
	709.03: Revised the reference specification for dowel bars and tie bars.
710 - Fence and Guardrail	710.06: Revised the preservative treatment for wood used to build wood sound barrier.
711 – Concrete Curing Materials and Admixtures	711.01: Revised the reference specification for liquid membrane-forming compounds for curing concrete.
712 - Miscellaneous	712.13(c): Added the requirements for polypropylene pipe.
713 – Traffic Control Materials	713.01: Revised the requirements for sign panels in Table 713-1.
	713.04: Replaced this subsection with the requirements for sign Message Materials.
	713.06: Deleted the requirements of this subsection. See subsection 713.04.
	713.08: Revised the requirements for glass beads for traffic markings.
	713.10(a): Revised the reflective quality requirements for delineator and median barrier reflectors.
	713.10(b): Added detailed requirements for retroreflective sheeting.
	713.17: Replaced the requirements for epoxy pavement marking material with the requirements for modified epoxy pavement marking material.
715 – Lighting and Electrical Materials	715.04: Revised to implement the use of LED luminaires.
	715.05: Replaced subsection with the requirements for LED drivers.

Following is a list of standard special provisions incorporated into the 2017 Standard Specifications:

#### **Standard Special Provisions Incorporated into the 2017 Standard Specifications**

- Revision of Sections 101, 508, 514 and 710 - Treated Timber
- Revision of Sections 101 and 630 - Construction Zone Traffic Control
- Revision of Section 102 - Contents of Proposal Forms
- Revision of Section 105 - Construction Surveying
- Revision of Section 105 - Contractor Submittals Traffic Signal Pedestal Pole
- Revision of Section 105 - Disputes and Claims for Contract Adjustments
- Revision of Section 105 - Hot Mix Asphalt Pavement Smoothness
- Revision of Section 105 - Portland Cement Concrete Pavement Smoothness
- Revision of Section 105 - Violation of Working Time Limitation

- Revision of Sections 105, 106, 412, 601, 709 - Conformity to the Contract of Portland Cement Concrete Pavement and Dowel Bars and Tie Bars for Joints
- Revision of Section 106 - Buy America Requirements
- Revision of Section 106 - Certificates of Compliance and Certified Test Reports
- Revision of Section 106 - Hot Mix Asphalt – Verification Testing
- Revision of Section 106 - Material Sources
- Revision of Section 106 - Modified Epoxy Pavement Marking Acceptance and Pay Factors
- Revision of Section 106 - Supplier List
- Revision of Sections 106 and 412 - Surface Texture of Portland Cement Concrete Pavement
- Revision of Sections 106, 627, and 713 - Glass Beads for Pavement Marking
- Revision of Section 107 - Responsibility for Damage Claims, Insurance Types, and Coverage Limits
- Revision of Section 107 - Warning Lights for Work Vehicles and Equipment
- Revision of Section 107 - Water Quality Control (CDOT Obtained Stormwater Permit)
- Revision of Section 107 - Water Quality Control (Contractor Obtained Stormwater Permit)
- Revision of Section 108 - Delay and Extension of Contract Time
- Revision of Section 108 - Holiday Weekend
- Revision of Section 108 - Liquidated Damages
- Revision of Section 108 - Notice to Proceed
- Revision of Section 108 - Project Schedule
- Revision of Section 108 - Subletting of Contract
- Revision of Sections 108 and 109 - Payment Schedule (Multiple Fiscal Years)
- Revision of Section 109 - Asphalt Cement Cost Adjustment (Asphalt Cement Included in the Work)
- Revision of Section 109 - Compensation for Compensable Delays
- Revision of Section 109 - Fuel Cost Adjustment
- Revision of Section 109 - Measurement of Quantities
- Revision of Section 109 - Measurement of Water
- Revision of Section 109 - Prompt Payment
- Revision of Section 109 – Scales
- Revision of Section 201 – Clearing and Grubbing
- Revision of Sections 202, 627, and 708 – Pavement Marking Paint
- Revision of Section 203 – Excavation and Embankment
- Revision of Sections 203, 206, 304, and 613 – Compaction
- Revision of Section 206 – Imported Material for Structure Backfill
- Revision of Section 206 – Structure Backfill (Flow-Fill)
- Revision of Section 206 – Structure Backfill at Bridge Abutments

- Revision of Sections 206 and 601 – Maturity Meters and Concrete Form and Falsework Removal
- Revision of Section 208 – Erosion Control
- Revision of Section 212 – Seed
- Revision of Section 213 – Mulching
- Revision of Section 216 – Soil Retention Covering
- Revision of Section 250 – Environmental, Health and Safety Management
- Revision of Sections 304 and 703 – Aggregate Base Course (RAP)
- Revision of Section 401 – Compaction of Hot Mix Asphalt
- Revision of Section 401 – Compaction Pavement Test Section (CTS)
- Revision of Section 401 – Temperature Segregation
- Revision of Sections 401 and 412 – Safety Edge
- Revision of Section 409 – Chip Seal
- Revision of Section 412 – Portland Cement Concrete Pavement Finishing
- Revision of Sections 412, 601, and 711 – Liquid Membrane-Forming Compounds for Curing Concrete
- Revision of Section 504 – Concrete Panel Facing MSE Wall
- Revision of Section 507 – Grouted Riprap Slope and Ditch Paving
- Revision of Sections 507, 601, and 606 – Macro Fiber-Reinforced Concrete
- Revision of Section 510 – Structural Plate Structures
- Revision of Section 512 – Bearing Device Testing
- Revision of Section 518 – Bridge Expansion Device
- Revision of Section 601 – Class B, BZ, D, DT, and P Concrete
- Revision of Section 601 – Class H and HT Bridge Deck Concrete
- Revision of Section 601 – Concrete Batching
- Revision of Section 601 – Concrete Finishing
- Revision of Section 601 – Concrete Slump Acceptance
- Revision of Section 601 – Depositing Concrete Under Water
- Revision of Section 601 – Fiber-Reinforced Concrete
- Revision of Section 601 – QC Testing Requirements for Structural Concrete
- Revision of Section 601 – Structural Concrete Strength Acceptance
- Revision of Sections 601 and 701 - Cements and Pozzolans
- Revision of Section 603 – Culvert Pipe Inspection
- Revision of Sections 603, 624, 705, 707, and 712 – Drainage Pipe
- Revision of Section 612 – Delineators
- Revision of Sections 613 and 715 – LED Roadway Luminaire

- Revision of Section 614 – Pedestrian Push Button Assembly
- Revision of Sections 614 and 713 – Sign Panel Sheeting
- Revision of Section 618 – Prestressed Concrete
- Revision of Section 627 – Preformed Plastic Pavement Marking
- Revision of Sections 627 and 713 – Modified Epoxy Pavement Marking
- Revision of Section 627 – Emergency Pull-off Area (Temporary)
- Revision of Section 630 – Retroreflective Sign Sheeting
- Revision of Section 627 – Temporary Portable Rumble Strips
- Revision of Section 702 – Bituminous Materials
- Revision of Section 703 – Aggregate for Bases
- Revision of Section 703 – Aggregate for Cover Coat Material
- Revision of Section 703 – Aggregate for Hot Mix Asphalt
- Revision of Section 703 – Aggregate for Stone Matrix Asphalt
- Revision of Section 703 – Classification for Aggregate Base Course
- Revision of Section 703 – Concrete Aggregate
- Revision of Section 703 – Mineral Filler
- Revision of Section 709 – Epoxy Coated Reinforcing Bars
- Revision of Section 712 – Geotextiles
- Revision of Section 712 – Water for Mixing or Curing Concrete
- Revision of Section 712 – Reflectors for Delineators and Median Barrier