

Design Standards Letter

Letter Number: **P-1997-02**

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Effective Date: **02/18/1997**

Section/Plan No.: **P203.20, P203.21, P203.50, P203.75, P502.05, P504.00, P604.27, P608.00, P608.10, P609.00, P609.40, P703.25, P731.10, P902.30, P902.40, P903.02, P903.05, P903.06, P903.07, P903.10, P903.12, P903.60, P612.20, P903.01, P602.00, P604.05, P604.20, P604.21, P604.22, P604.23, P604.24, P604.25, P604.26, P604.27, P604.28, P604.29, P604.30, P604.40, P606.00, P608.20, P614.10, P617.00, P703.20, P703.21, P703.22, P703.24, P731.00, P732.05, P732.10, P605.10, P901.00, P901.01, P902.20, P903.08**

Subject: **1997 Standard Plans Book - Revised, New, and Deleted Standard Plans and Revised D-2 Sheet**

Body

Below is a listing of the revised, new and deleted standard plans, with a brief description of each. The new and revised standard plans are effective with the May, 1997 bid opening and are incorporated into the 1997 *Missouri Standard Plans for Highway Construction*. The English and Metric versions of the 1997 standard plans book will be distributed to division and district offices and to consultants currently working for MoDOT. Others desiring a copy should contact Bill Connell at 573-526-2922.

Revised English Standard Plans

203.20D - Superelevation Spirals and Widening (Undivided Highways) and.

203.21D - Superelevation Spirals and Widening (Divided Highways)

These standard plans have been revised to follow the AASHTO's Policy of Geometric Design of Highways and Streets (1990)(Green Book) recommendations for superelevation. Major revisions are:

Revised the superelevation and widening table values for degree of curve, "e" and "L", to match the Green Book.

As recommended in the Green Book, the tangent runoff rate of removal now equals the superelevation runoff rate; meaning MoDOT now incorporates a straight line method of superelevating from Section A-A to Section D-D.

The location of the PC or PT is now at L/3 for all cases.

The location of the profile grade is at the inside edges of the traveled ways. The typical section D-61 will be changed in the near future to reflect this.

Gives a note defining the tangent runout for Case I. Also, gives a formula for calculating X (the tangent runoff).

Changed all references to pavement or pavement width to traveled way to eliminate any confusion with pavement structure.

203.50K - Typical Cross-Overs (Divided Highways)

Revised to show the 4' shoulder as part of the pavement area from the taper, through the storage area and through the crossover area. The pavement quantities for the English standard plan previously included the shoulder quantities; this is not changed. Added 10:1 slopes to the crossovers to make the approaches to the crossover less dangerous in case a vehicle should leave the traveled way and enter the crossover via the median. Revised to show details of geometrics for the crossover. Drainage shall be handled on an individual basis for each crossover. Added a note showing where a 4" yellow edge line stripe shall be made.

203.75A - Rumble Strips

Removed joint at inside shoulder on divided highways with concrete shoulders.

502.05B - Concrete Pavement and Base Appurtenances (Sheets 1 of 2 and 2 of 2)

Removed joint at inside shoulder on divided highways. Allowed contractor option of Type K or Type L longitudinal joints. This gives the contractor the ability to choose a paving width to fit their preferred method of operation.

504.00B - Concrete Approach Pavement

Removed joint at inside shoulder on divided highways. Allowed contractor option of Type K or Type L longitudinal joints. This gives the contractor the ability to choose a paving width to fit their preferred method of operation.

604.27E - Drop Inlet - Type S - Sheet 3 of 3

Revised to allow the standard to be used independent of typical section. Now requires 0.5 ft of feedboard above top of inlet grate in median sections on grade as specified in PPDM.

608.00E - Paved Approaches - Sheets 1 of 2 and 2 of 2

Revised view titles to clarify that the 3-D views were intended to depict the curb openings, not the street, sideroads, alleys, commercial approaches, or private approaches. Added a note that the ramps were shown for reference only. Added note showing 1/2" transverse expansion joints, and referring to standard plan 609.00 for transverse expansion joint details.

608,10J - Concrete Sidewalk and Curb Ramps - Sheet 1 of 2

Clarified details showing 1/2" preformed fiber expansion joints between sidewalk and paved approaches.

609.00H - Concrete Curb, Curb and Gutter, Gutter

Added 4" Type A Barrier Curb.

609.40G - Drain Basin, Shoulder Paving and Fill Slopes at Bridge Ends - Sheet 1 of 2

Replaced "BCT" with "Approved Crashworthy Guardrail Terminal."

703.25F - Concrete Box Culverts - Skew Data - Sheet 1 of 3

Added granular backfill under bottom slab.

731.10M - Precast Drop Inlet - Sheet 4 of 4

Revised to allow the standard to be used independent of typical section. Now requires 0.5 ft. of freeboard above top of inlet grate in median sections on grade as specified in PPDM.

902.30K - Post Bases

Redesigned to increase capacity and to include mast arms up to 54 feet in length.

902.40K - Tubular Steel Posts

Sheet 1 of 2

Added typical drawings for traffic signal posts, luminaire mounting brackets and mast arm welds. Relocated the base selection chart to 902.30K. Revised other information and drawings for clarification and incorporation of current practices.

Sheet 2 of 2

New sheet establishes minimum design criteria for the manufacture of traffic signal structures.

903.02AA - Highway Signing - Sheet 1 of 8

Corrected errors: Note (1) on typical advance guide sign detail was changed to refer to note (3). Box dimension for 3/4 fraction on overhead sign changed from 15" H X 20" W to 15" H X 25" W. Note designated by * under Guide Sign Legend changed to show ground mount signs as STRIL-2 or L-4 instead of STR2L-2 or L-4.

903.05D - Tubular Span Support - One Tube - Type S

Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00

903.06D - Tubular Span Support - Two Tube - Type S

Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00

903.07D - Tubular Cantilever Support - Type C

Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00

903.10 - Overhead Sign Trusses - Aluminum

Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00

903.12 - Overhead Sign Trusses - Butterfly & Cantilever - Structural Steel

Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00

903.60 - Overhead Sign Trusses - Structural Steel

Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00

New English Standard Plans

612.20 - Sand Filled Impact Attenuators

Deleted English Standard Plans

903.01 Highway Signing - Standard Alphabet - Numeral Series for Sign Usage - Sheet 1 of 2

This sheet has been deleted. Sheet 2 of 2 now becomes 903.01 - Special Signing Characters - Sheet 1 of 1

Revised Metric Standard Plans

M203.20A - Superelevation Spirals and Widening (Undivided Highways) and

M203.21A - Superelevation Spirals and Widening (Divided Highways)

These standard plans have been revised to follow the AASHTO's Policy of Geometric Design of Highways and Streets (1994) (Green Book) recommendations for superelevation. Major revisions are:

Revised the superelevation and widening table values for degree of curve, "e" and "L", to match the Green Book.

As recommended in the Green Book, the tangent runout rate of removal now equals the superelevation runoff rate; meaning MoDOT now incorporates a straight line method of superelevating from Section A-A to Section D-D.

The location of the profile grade is at the inside edges of the traveled ways. The typical section D-61 will be changed in the near future to reflect this.

Gives a note defining the tangent runout for Case I. Also, give a formula for calculating X (the tangent runoff).

Changed all references to pavement or pavement width to traveled way to eliminate any confusion with pavement structure.

M203.50A - Typical Cross-Overs (Divided Highways)

This standard plan now shows the 1.2 m shoulder as part of the pavement area from the taper, through the storage area and through the crossover area. The metric plan pavement areas are new numbers recalculated based on the inclusion of the shoulder quantities as part of the pavement area. Added 1:10 slopes to the crossovers to make the approaches to the crossover less dangerous in case a vehicle should leave the traveled way and enter the crossover via the median. Revised to show details of geometrics for the crossover. Drainage shall be handled on an individual basis for each crossover. Added a note showing where a 100 mm yellow edge line stripe shall be made.

M203.75A - Rumble Strips

Removed joint at inside shoulder on divided highways with concrete shoulders.

M502.05B - Concrete Pavement and Base Appurtenances (Sheets 1 of 2 and 2 of 2)

Removed joint at inside shoulder on divided highways. Allowed contractor option of Type K or Type L longitudinal joints. This gives the contractor the ability to choose a

paving width to fit their preferred method of operation. Changed metric rebar designations to match ASTM specifications.

M504.00B - Concrete Approach Pavement

Removed joint at inside shoulder on divided highways. Allowed contractor option of Type K or Type L longitudinal joints. This gives the contractor the ability to choose a paving width to fit their preferred method of operation. Changed metric rebar designations to match ASTM specifications.

M602.00A - Right-of-Way and Drain Markers

Changed metric rebar designations to match ASTM specifications.

M604.05B - Pipe Culvert Headwalls - Type S

Changed metric rebar designations to match ASTM specifications.

M604.20A - Drop Inlet - Type B

Changed metric rebar designations to match ASTM specifications.

M604.21 B - Drop Inlet - Type C

Changed metric rebar designations to match ASTM specifications.

M604.22A - Drop Inlet - Type D

Changed metric rebar designations to match ASTM specifications.

M604.23A - Drop Inlet - Type E

Changed metric rebar designations to match ASTM specifications.

M604.24A - Drop Inlet - Type EE

Changed metric rebar designations to match ASTM specifications.

M604.25B - Drop Inlet - Type F

Changed metric rebar designations to match ASTM specifications.

M604.26A - Drop Inlet - Type G

Changed metric rebar designations to match ASTM specifications.

M604.27B - Drop Inlet - Type S

Sheet 1 of 3 and Sheet 2 of 3

Changed metric rebar designations to match ASTM specifications. Sheet 3 of 3

Revised to allow the standard to be used independent of typical section. Now requires 0.5 ft of freeboard above top of inlet grate in median sections on grade as specified in PPDM.

M604.28A - Drop Inlet - Type T

Changed metric rebar designations to match ASTM specifications.

M604.29A - Drop Inlet - Type X

Changed metric rebar designations to match ASTM specifications.

M604.30A - Concrete Manholes

Changed metric rebar designations to match ASTM specifications.

M604.40A - Pipe Collars

Changed metric rebar designations to match ASTM specifications.

M606.00B - Guardrail

Changed metric rebar designations to match ASTM specifications.

M608.00B - Paved Approaches - Sheets 1 of 2 and 2 of 2

Revised view titles to clarify that the 3-D views were intended to depict the curb openings, not the street, sideroads, alleys, commercial approaches, or private approaches. Added a note that the ramps were shown for reference only. Added note showing 13 mm transverse expansion joints and referring to standard plan 609.00 for transverse expansion joint details.

M608.10B - Concrete Sidewalk and Curb Ramps - Sheet 1 of 2

Clarified details showing 13 mm preformed fiber expansion joints between sidewalk and paved approaches.

M608.20A - Concrete Stairs

Changed metric rebar designations to match ASTM specifications

M609.00A - Concrete Curb, Curb and Gutter, Gutter

Added 4" Type A Barrier Curb. Changed metric rebar designations to match ASTM specifications

M609.40B - Drain Basin, Shoulder Paving, and Fill Slopes at Bridge Ends - Sheet 1 of 2

Replaced "BCT" with "Approved Crashworthy Guardrail Terminal."

M614.10B - Curb Inlets, Grates, & Bearing Plates

Changed metric rebar designations to match ASTM specifications

M617.00B - Concrete Traffic Barrier

Changed metric rebar designations to match ASTM specifications

M703.20A - Concrete Single Box Structure (Straight Wings - Square) - Sheet 3 of 3

Added granular backfill under bottom slab

M703.21A - Concrete Single Box Structure (Flared Wings - Square) - Sheet 3 of 3

Added granular backfill under bottom slab

M703.23A - Concrete Single Box Structure (Straight Wings - Skewed) - Sheet 3 of 3

Added granular backfill under bottom slab

M703.24A - Concrete Single Box Structure (Flared Wings - Skewed) - Sheet 3 of 3

Added granular backfill under bottom slab

M731.00B - Precast Manholes

Changed metric rebar designations to match ASTM specifications

M731.10B - Precast Drop Inlet - Sheet 1 of 4 through 4 of 4

Changed metric rebar designations to match ASTM specifications. Revised to allow the standard to be used independent of typical section. Now requires 0.5 ft. of freeboard above top of inlet grate in median sections on grade as specified in PPDM.

M732.05A - Beveled Pipe End Treatment

Changed metric rebar designations to match ASTM specifications

M732.10B

Changed metric rebar designations to match ASTM specifications

M901.00A - Poles, Foundations & Appurtenances for 9.0 m Mounting Height

Changed metric rebar designations to match ASTM specifications

M901.01A - Poles, Foundations & Appurtenances for 13.5 m Mounting Height

Changed metric rebar designations to match ASTM specifications

M902.20A - Pull Boxes

Changed metric rebar designations to match ASTM specifications

M902.30A - Post Bases

Redesigned to increase capacity and to include mast arms up to 16.5 meters in length. Changed metric rebar designations to match ASTM specifications.

M902.40A - Tubular Steel Posts

Sheet 1 of 2

Added typical drawings for traffic signal posts, luminaire mounting brackets and mast arm welds. Relocated the base selection chart to M902.30A. Revised other information and drawings for clarification and incorporation of current practices.

Sheet 2 of 2

New sheet establishes minimum design criteria for the manufacture of traffic signal structures.

M903.02A - Highway Signing - Sheet 1 of 8

Corrected errors: Note (1) on typical advance guide sign detail was changed to refer to note (3). Box dimension for 3/4 fraction on overhead sign changed from 375 mm H x 500 mm W to 375 mm H x 625 mm W. Note designated by * under Guide Sign Legend changed to show ground mount signs as STRIL - 2 or L-4 instead of STR2L - 2 or L-4.

M903.05A - Tubular Support Steel - Type S, one Tube (Span)

Changed metric rebar designations to match ASTM specifications. Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00.

M903.06A - Tubular Support Steel - Type S, Two Tube (Span)

Changed metric rebar designations to match ASTM specifications. Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00.

M903.07A - Tubular Support Steel - Type C (Cantilever)

Changed metric rebar designations to match ASTM specifications. Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00.

M903.08A - Tubular Support Steel - Type B (Butterfly)

Changed metric rebar designations to match ASTM specifications

M903.10A - Overhead Sign Trusses - Aluminum

Changed metric rebar designations to match ASTM specifications. Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00.

M903.12A - Overhead Sign Trusses - Butterfly & Cantilever - Structural Steel

Changed metric rebar designations to match ASTM specifications. Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00.

M903.60A - Overhead Sign Trusses - Structural Steel

Changed metric rebar designations to match ASTM specifications. Removed details of guardrail installation at sign post bases. Guardrail is installed as specified on Standard Plan 606.00.

New Metric Standard Plans

M605.10 - Class A Underdrains

M612.20 - Sand Filled Impact Attenuators

Detailed Metric Standard Plans

M903.01 - Highway Signing - Standard Alphabet - Numeral Series for Sign Usage - Sheet 1 of 2.

This sheet has been deleted. Sheet 2 of 2 now becomes 903.01 - Special Signing Characters - Sheet 1 of 1

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