

Appendix G – Signage and Striping Supplement

1.00: GENERAL REQUIREMENTS

Because the County will maintain the traffic control devices on public rights-of-way, all traffic control devices shall be fabricated and installed in accordance with Douglas County Standards (See Appendix A, Signage and Striping Notes, Note A).

The "Engineer" refers to the Douglas County Engineer and/or authorized agent or representative.

Permanent signage and striping shall be completely in place before any new roadway is opened to the public. These standards are to be used in conjunction with other applicable Douglas County Standards.

Signage installed onto traffic signal equipment shall conform to the Colorado Department of Transportation standards and specifications and the Douglas County Signal Specifications.

All traffic control devices shall conform to the most recent version of the federal Manual on Uniform Traffic Control Devices (MUTCD), the "Colorado Supplemental MUTCD", the Douglas County "Roadway Design and Construction Standards Manual" and the "Douglas County Signage and Striping Supplement".

A field inspection of location and installation of all signs & markings shall be performed by Douglas County. All discrepancies identified during the field inspection must be corrected before the two-year warranty period will begin.

2.00: SIGNAGE CRITERIA

2.10: SIGN MATERIAL

2.10a: SIGN BLANKS

Aluminum blanks shall be 0.080 gauge. (See Drawing Number SS-2)

2.10b:

Diamond grade material shall be used on all stop signs and overhead signs. All other roadside traffic control devices shall be high intensity prismatic retroreflective.

2.10c:

Where stop sign control is appropriate, 36" stop signs shall be used for approaches to any roadway that is classified as a collector or greater.

Appendix G – Signage and Striping Supplement

2.10d: STREET NAME SIGNS

2.10d1. Street names are to be obtained from the Douglas County Community Development Department for all intersections. Urban Arterials shall have block numbers.

2.10d2. A 7-foot minimum height shall be maintained from bottom of sign panel to the top grade of sidewalk (at top grade of pavement edge where no sidewalk exists).

2.10d3. Refer to Street Name Sign Drawings SS-2 and SS-3 for street name assembly requirements and sizes. When street name assembly is combined with regulatory sign(s), regulatory sign placement shall govern.

2.10d4. All public road street name signs shall include the Douglas County logo (except for allowances listed below in Section 2.40). When arrows are used/required, DC Logo will be omitted.

2.10d5. All ground mount street name signs shall be high intensity prismatic material. All overhead mounted street name signs shall be Diamond Grade-Long Distance Performance (LDP) material or equivalent.

2.10d6. Street name sign coloring shall be white legend on green background, unless approved otherwise.

2.10d7. Special care shall be taken in sign location to ensure an unobstructed view of each sign.

2.10d8. All removed signs shall be returned to Douglas County Traffic Service, call 303-663-6237 for drop off location.

2.10d9. CIP and/or Special project for roadway improvements shall require all existing traffic signs to be replaced with new traffic signs.

2.20: POSTS AND ANCHOR POSTS

2.20a: All ground mounted signs shall be mounted on standard 12 gauge, two inch by two inch (2"x2") galvanized square steel tube posts, all four sides punched with 3/8" holes at one inch (1") centers.

2.20b: For all signs installed with raised median islands and roundabouts mounted in concrete the "KLEEN BREAK MODEL 425" anchors also need to be installed (per Xcessories Squared Development and Manufacturing Inc. Drawing #XKB425-20-CI "Square Post Sign Support Installation Instructions")

Appendix G – Signage and Striping Supplement

3.30d: Surface temperatures shall be 50° F and rising for all pavement marking applications.

3.30e: When the surface temperature does not reach 50° F (seasonal), the Contractor may, on approval of the Engineer, substitute designated pavement markings with temporary marking materials to be replaced with permanent materials when weather dictates.

3.40: INSTALLATION

All pavement markings shall be applied per the manufacturer's recommendations, unless otherwise authorized by the Engineer.

3.50: PAVEMENT MARKING WARRANTY

The following warranty is required for pavement marking installations:

Two year with normal traffic wear. Material shall not peel or lift in this time period. Approval of all work must be obtained from the Douglas County Traffic Services Division of Public Works Engineering prior to the start of this warranty period.

4.00: LEGENDS

4.10: USE OF STOP BARS

4.10a: Any stop sign controlled approach to a crosswalk adjacent to a school shall include a stop bar.

4.10b: Any multi-way stop controlled approach shall include a stop bar.

4.10c: Any approach to a signalized intersection which does not have a crosswalk shall include a stop bar.

4.10d: Stop lines may be staggered longitudinally on a lane-by-lane basis or as determined by Douglas County Traffic Engineering.

4.20: WORD OR ARROW PAVEMENT MARKING

Any approach to signalized intersection, pavement arrow shall be placed 70 ft back of stop bar or crosswalk. See MUTCD Section 3B.20 for all other word or arrow pavement marking placement or as determined by Traffic Engineering.

5.00: BIKE LANES

Bike lanes are lanes that have been designated with pavement markings for the preferential use of bicyclists. They are typically one-way facilities located to the right of the general travel lanes on both sides of two-way streets.

Appendix G – Signage and Striping Supplement

5.10: BIKE LANE WIDTH

The minimum bike lane width on a roadway with no curb and gutter is 4 feet. On roadway with curb and gutter, the minimum width of a bike lane is 5 feet, measured from the face of curb.

5.20: DESIGNATING BIKE LANES

Bike lanes shall be designated with the bicycle symbol with the directional arrow (shown in SS-10). Using the directional arrow encourages bicyclists to ride with traffic, as the law requires.

Bicycle lane markings should be placed after intersections and major driveways (see Traffic Engineer for placement). In rural areas, the maximum spacing of bike lane markings should not exceed 1500 feet. In urban areas, the spacing should not exceed 700 ft or as determined by Douglas County Traffic Engineer.

The 6-inch white stripe on the left of the bike lane should become dotted (2-foot line with a 6-foot gap) at improved bus stops with pads to clarify that buses are to move right to allow transit riders to disembark off the roadway.

5.30: BIKE LANES AT DRIVEWAYS AND INTERSECTIONS

In Colorado, bicycles are vehicles and are required to follow the rules of the roadway when riding on the streets. Consequently, the striping and marking of bike lanes at intersections should support the operations of bicycles as vehicles, and the safe mixing of bicyclists with motorists at conflict points such as driveways and intersections.

For both motor vehicles and bicycles the approach to a right turn and a right turn shall be made from as close as practicable to the right-hand curb or edge of the roadway. To support crossing a bike lane at a right turn the bike lane striping is either terminated or becomes dotted on the approach to the intersection.

When motorists cross a bike lane to move into a right turn lane, motorists are required to yield the right of way to bicyclists in the bike lane. This means the use of the BEGIN RIGHT TURN LANE YIELD TO BIKES sign (R4-4) (shown in SS-10) is appropriate when it is added to a roadway where a turn lane is added.

5.40: SHARED LANES

A shared lane is a lane of a traveled way that is open to bicycle travel and vehicular use. On local roadways with low volumes and speeds, a shared lane may be all that is needed to comfortably accommodate a bicyclist.

Refer to the SS-17 and SS-18 for proper placement of SHARED LANE MARKINGS.

Appendix G – Signage and Striping Supplement

2.20c: Xcessories Squared 1.25" Aluminum Sign Brace Non Perforated (or equivalent) shall be used on all signs that are >= 1,152 sq in (or as directed by Douglas County Engineering). Install per manufacturers recommendations/specifications.

2.30: CRITERIA ON SPECIAL ALLOWANCES FOR STREET NAME SIGN VARIANCES

2.30a: Plans for any variances must be submitted to and reviewed by the Douglas County Department of Public Works. Engineering Specific variances from County standards must be listed in the special footnote box on the first page of the plans.

2.30b: Only Metro Districts may apply for variances. The Metro District must submit a draft agreement to be reviewed by the Engineering Division and the County Attorney.

2.30c: The agreement is to be addressed to the Department of Public Works Engineer. It must specify that it is the requesting Metro District's responsibility for maintenance and supply in perpetuity of their specific signs and materials.

2.30d: This agreement will be recorded; and notification of the book and page number will be returned to the Metro District.

2.40: DESIGNER'S RESPONSIBILITY

These standards are intended for typical applications of signage and striping for standard conditions. These standards do not alleviate the responsibility of the designer from sound engineering judgment, or from exceeding minimum standards in specific cases where conditions warrant.

3.00: STRIPING CRITERIA

3.10: MATERIAL

- Approved striping materials;
- Waterborne traffic paint (prefer Ennis Flint #980601W, 980602YE or Swarco Colorado Paints #1160 Series)
- Paint Bead – Colorado blend 40%(T-20 coated or equivalent)
- Preformed thermoplastic
- Inlay tape (Stamark or approved equivalent)
- Epoxy paint (Modified Epoxy Pavement Marking, see latest CDOT section 627 & 713)
- Epoxy Bead – Colorado blend 40%(T-20 coated or equivalent)
- Methyl-mythacralate (MMA)
- MMA Bead – Swarco #3131 Blend (T-13') or Potters Visiblend MMA AC 20's
- Other as specified by Engineer.

Appendix G – Signage and Striping Supplement

5.50: BUFFERED BIKE LANES

A buffered bike lane that is separated from adjacent through lanes by a striped out buffer area (SS-19). In some locations it may be desirable to use less than the full space available for a bike lane.

5.60: DESIGN OF BICYCLE SIGNS

If the sign or plaque applies to motorists and bicyclist, then the size of sign shall be as shown for the conventional roads per MUTCD in Tables 2B-1, 2C-2 or 2D-1.

The minimum sign and plaque sizes for shared-use paths shall be those shown in MUTCD Table 9B-1, and shall be used only for signs and plaques installed specifically for bicycle traffic applications. The minimum sign and plaque sizes for bicycle facilities shall not be used for signs or plaques that are placed in a location that would have any application to other vehicles.

Appendix G – Signage and Striping Supplement

3.20: DIMENSIONS & APPLICATION

The following striping widths shall be used unless otherwise directed by the Engineer.

Table with 2 columns: Striping Type and Width. Includes Edge Line (5"), Skip/Lane Line (5"), White Channelizing (8"), Bike Lane (6"), Double Yellow (5" (3' Gap)), Stop Bar (24" (4' from crosswalk)), Diagonal Shoulder Marking (4"), Yield Line (16" x 24" layout based on lane widths and/or size to be determined by the County Engineer), Crosswalk Bar* (2'x10' on Arterials, all others to be 2'x8', (Centered in lane) layout and/or size to be determined by the County Engineer).

Note: Broken and/or Dotted marking patterns shall be per CDOT specs *Unless otherwise directed by the County Engineer.

3.21: APPLICATIONS

Table with 2 columns: Thickness and Application. Includes Paint (15-19 mils), MMA (50-70 mils (RMV or 4:1) Spray application only), Preform Thermo Plastic Pave-Mark (90 mils), Epoxy (16-18 mils per 90-100 Sq ft), Inlay Tape (Per manufacturer specification), Beads (Paint: 7-8 lbs. per Gal, MMA: 11.5-12.5 per 100 Sq ft (Pressurized bead applicator), Epoxy: 18-20lbs. per 90-100 Sq ft).

3.30: SURFACE PREPARATION

Note: Surface preparation includes clean up and disposal of removed material.

3.30a: New concrete pavement shall have all residues removed, such as mud, dirt, curing compound, etc. Removal shall be by water blasting, sand blasting or other method approved by the Engineer.

3.30b: New asphalt pavements shall be dry and free of dirt and debris.

3.30c: For all re-striping on existing concrete or asphalt pavement, the surface shall be clean, dry and free of debris. Cleaning shall be by water sweeping, water or air blasting, or other method approved by the Engineer. Surface grinding shall be performed where directed by the Engineer.

Appendix G – Signage and Striping Supplement

Signage and Striping Notes

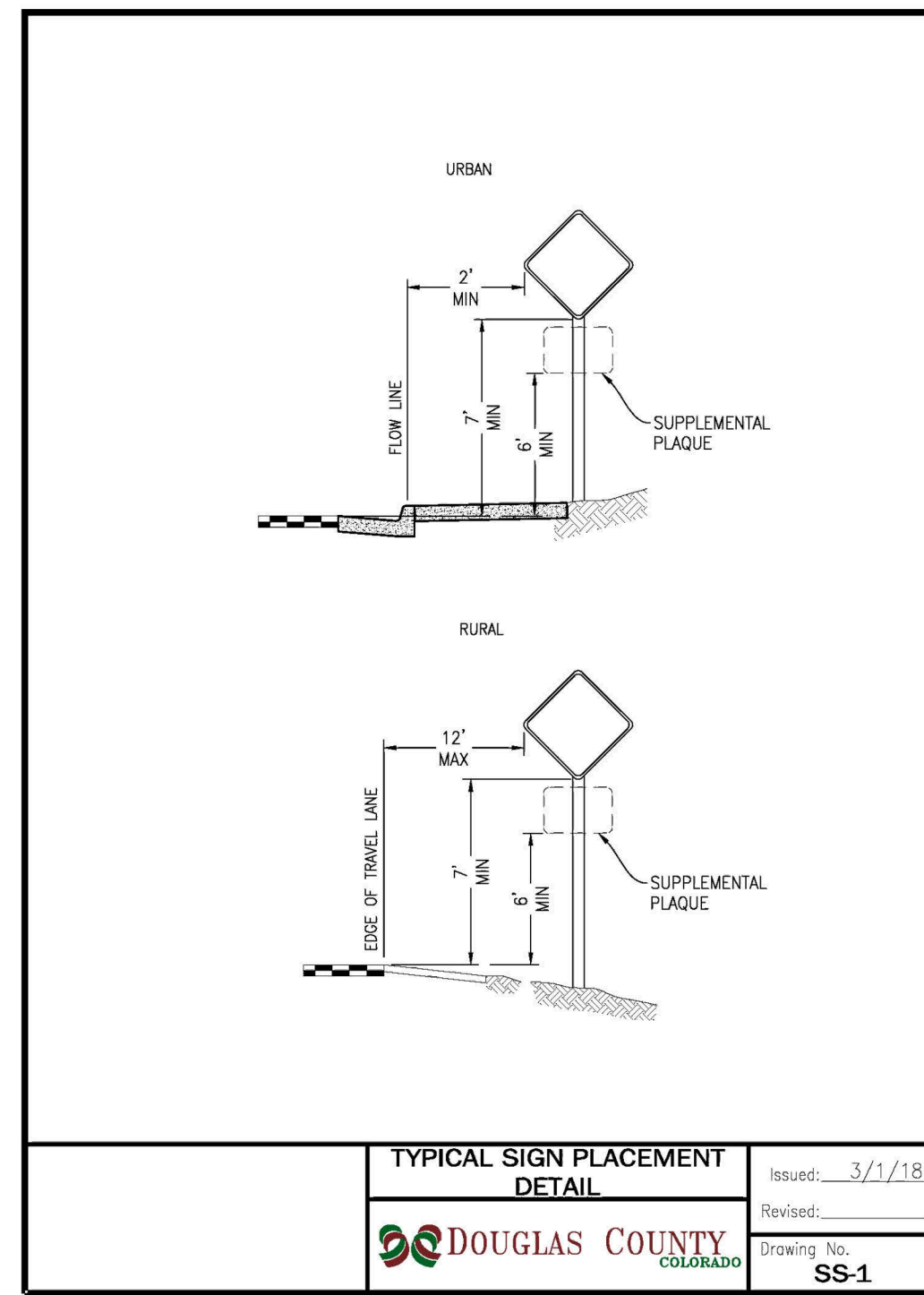
- A. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MOST RECENT VERSION OF THE FEDERAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
B. A FIELD INSPECTION OF LOCATION AND INSTALLATION OF ALL SIGNS & MARKINGS SHALL BE PERFORMED BY DOUGLAS COUNTY
C. THE CONTRACTOR INSTALLING SIGNS SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND UTILITIES
D. TYPE III LIGHTED BARRICADES SHALL BE SET AT ENDS OF ROADWAYS, SEPARATING FINISHED (AND/OR ACCEPTED) AND UNFINISHED CONSTRUCTION AREAS AND SHALL BE MAINTAINED BY THE CONTRACTOR/DEVELOPER
E. SPECIAL CARE SHALL BE TAKEN IN SIGN LOCATION TO ENSURE AN UNOBSTRUCTED VIEW OF EACH SIGN
F. WHERE STOP SIGN CONTROL IS APPROPRIATE, 36" STOP SIGNS SHALL BE USED FOR APPROACHES TO ANY ROADWAY THAT IS CLASSIFIED AS A COLLECTOR OR GREATER
G. A 7-FOOT MINIMUM HEIGHT SHALL BE MAINTAINED FROM BOTTOM OF SIGN PANEL TO THE TOP GRADE OF SIDEWALK (AT TOP GRADE OF PAVEMENT EDGE WHERE NO SIDEWALK EXISTS)
H. DELINEATION OF ROADWAYS WITHOUT CURB AND GUTTER SHALL BE AS SPECIFIED IN THE CDOT "M AND S STANDARDS"
I. SIGNAGE AND STRIPING HAS BEEN DETERMINED BY INFORMATION AVAILABLE AT THE TIME OF REVIEW
J. DIAMOND GRADE MATERIAL SHALL BE USED ON ALL STOP SIGNS AND OVERHEAD SIGNS
K. ALL PUBLIC ROAD STREET NAME SIGNS SHALL HAVE DOUGLAS COUNTY LOGO ON LEFT SIDE OF SIGN
L. ALL REMOVED SIGNS SHALL BE RETURNED TO DOUGLAS COUNTY TRAFFIC SERVICES
M. CROSSWALKS: SHALL BE CONSTRUCTED OF MATERIAL SPECIFIED BY DOUGLAS COUNTY
N. ALL PAVEMENT MARKING MATERIAL (INCLUDING WORDS AND SYMBOLS) SHALL BE AS FOLLOWS
O. INSPECTION AND APPROVAL OF STRIPING AND CROSSWALK LAYOUT TO BE DONE BY DOUGLAS COUNTY ENGINEERING INSPECTION DEPARTMENT

Table for INDEX OF REVISIONS with columns: Rev. No., Date, Description. Includes entries for 1 (5/18) RESSUE and 2 (4/17) Update Sec 2x20c.

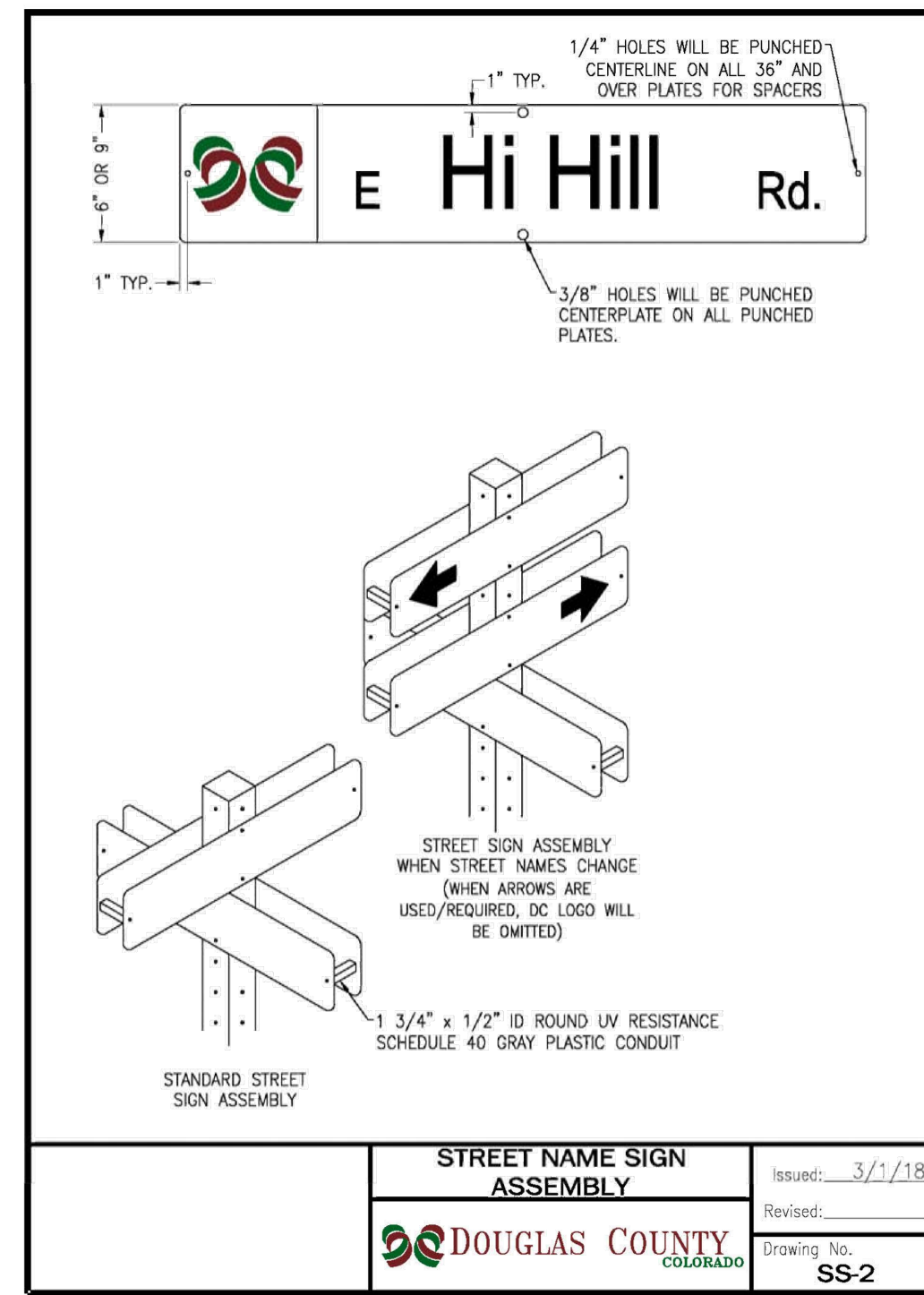
DOUGLAS COUNTY COLORADO Engineering Division 100 Third Street Castle Rock, Colorado 80104 (303) 660-7490

SIGNING AND STRIPING SUPPLEMENT PAGE 1-8 SIGNAGE AND STRIPING SUPPLEMENT

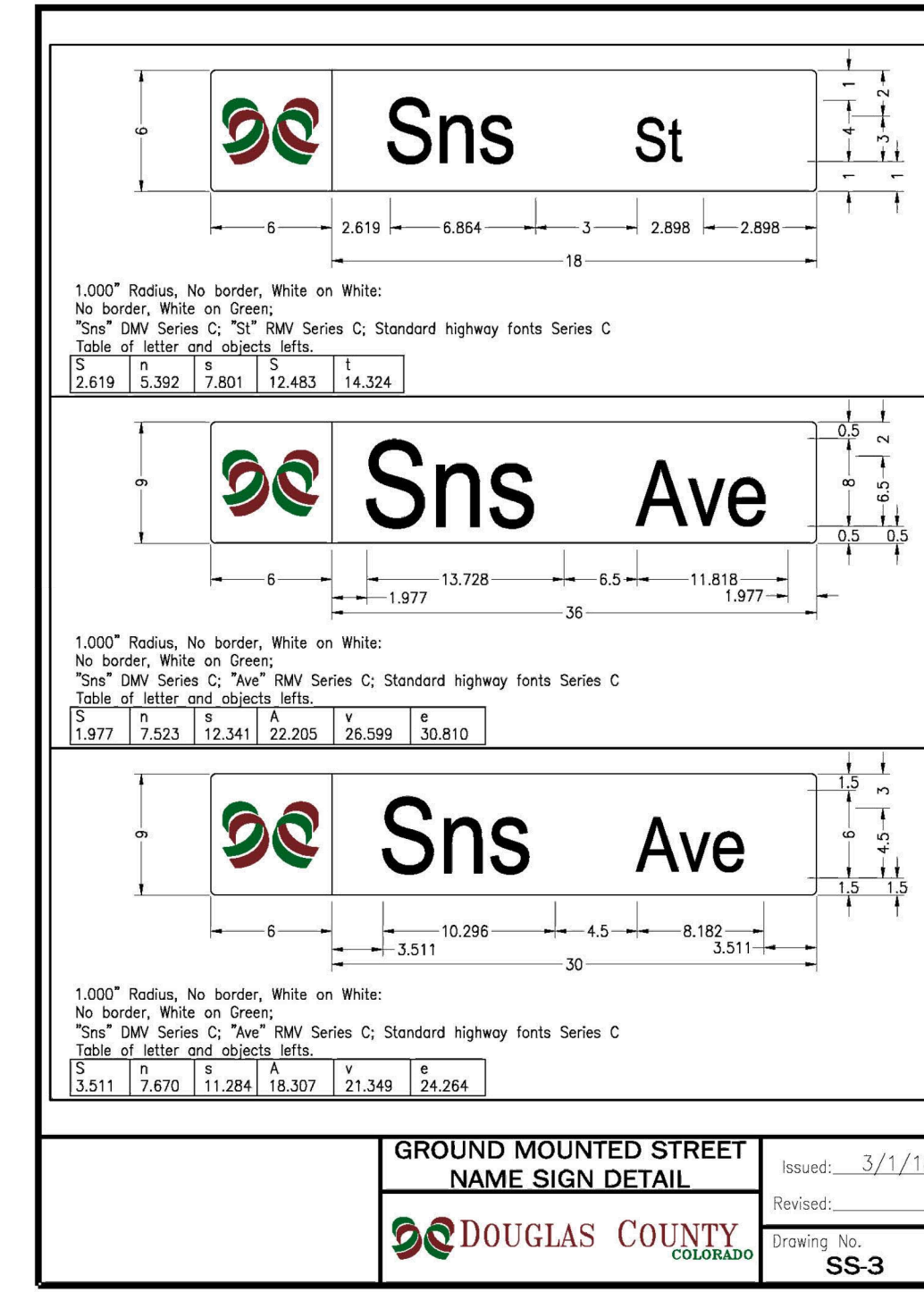
Table for Design/Drawn/Checked/Date/Scale/Job No. with values: BLS, 6/03, N/A.



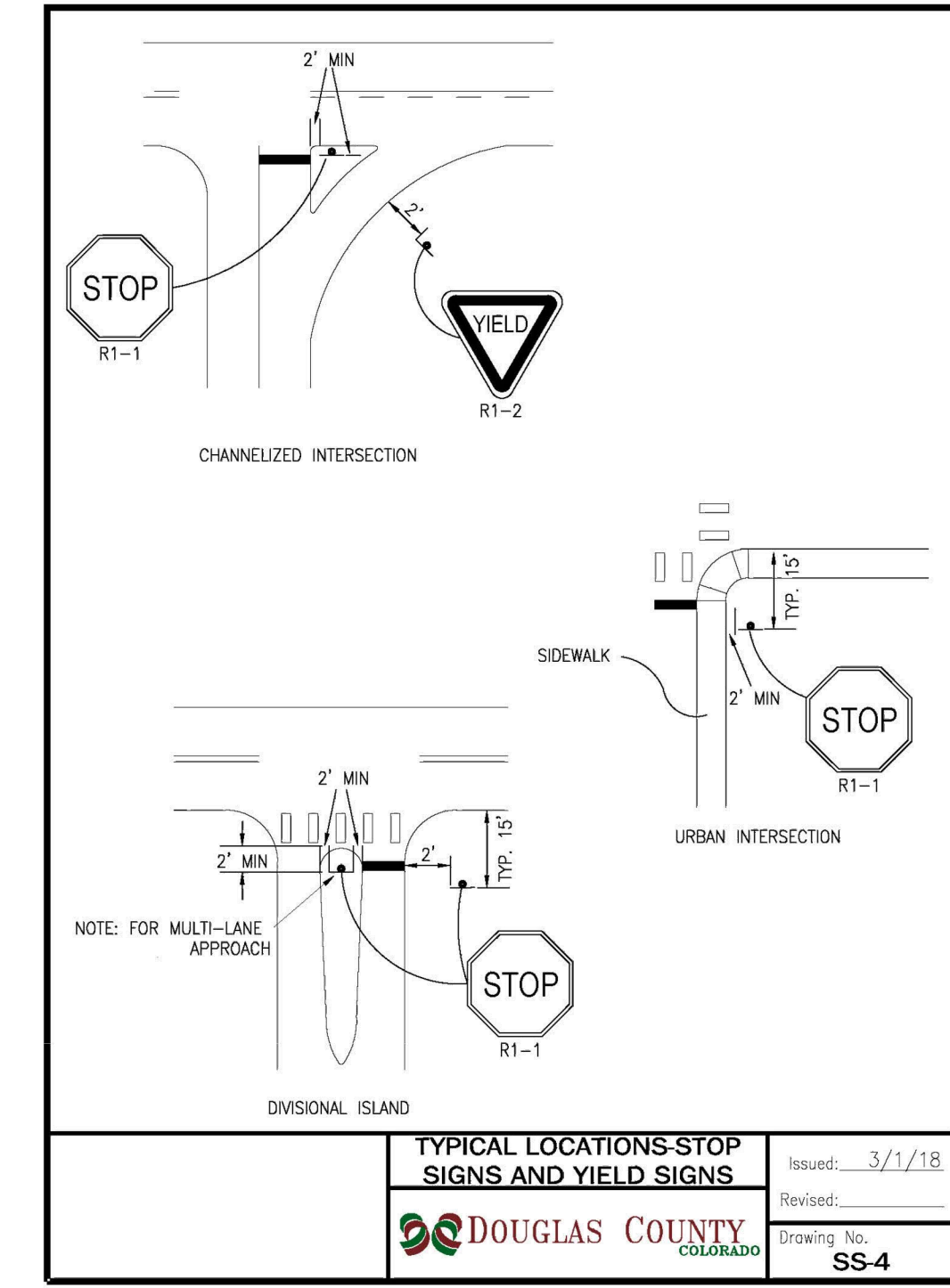
TYPICAL SIGN PLACEMENT DETAIL
 Issued: 3/1/18
 Revised:
 Drawing No. SS-1



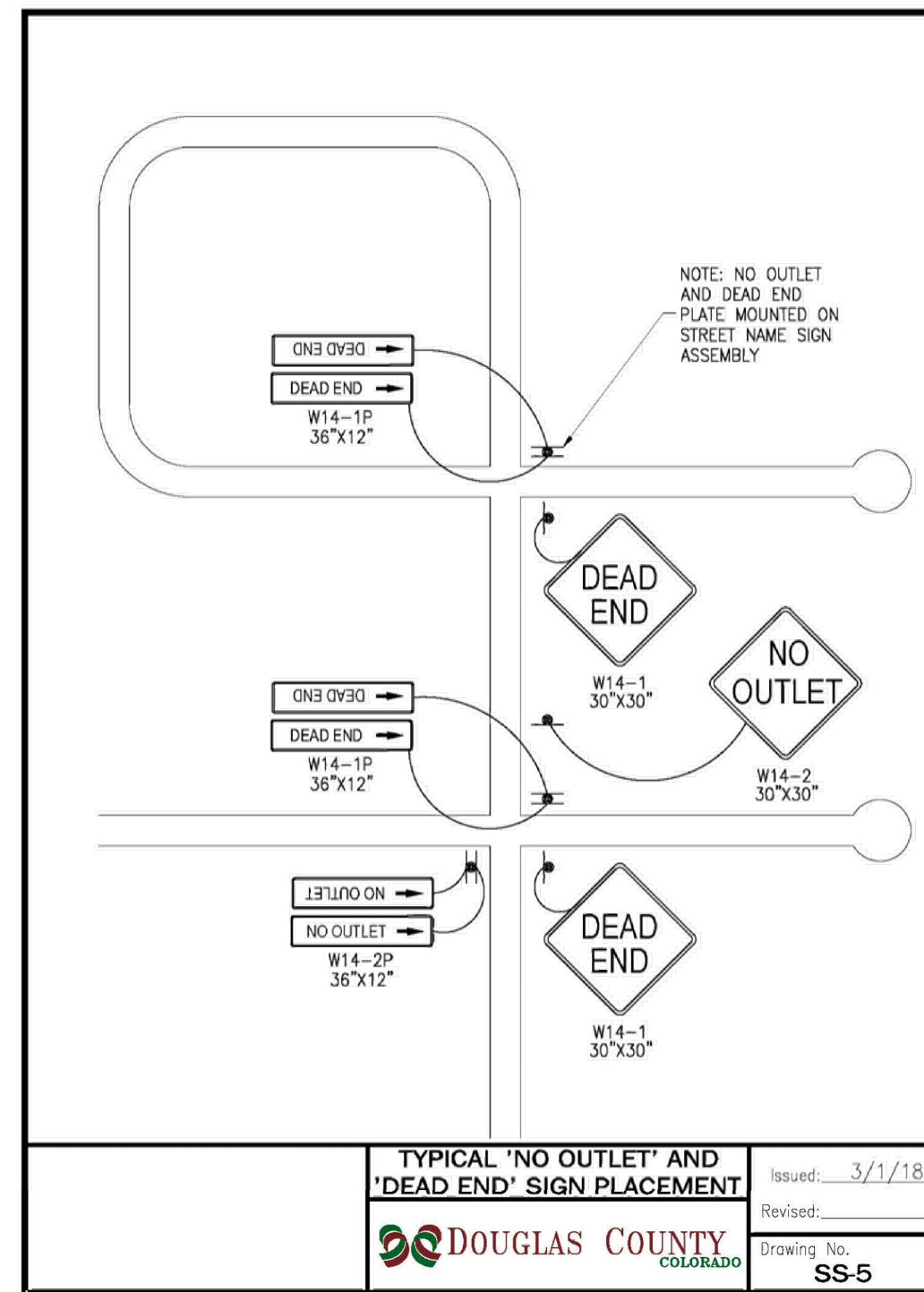
STREET NAME SIGN ASSEMBLY
 Issued: 3/1/18
 Revised:
 Drawing No. SS-2



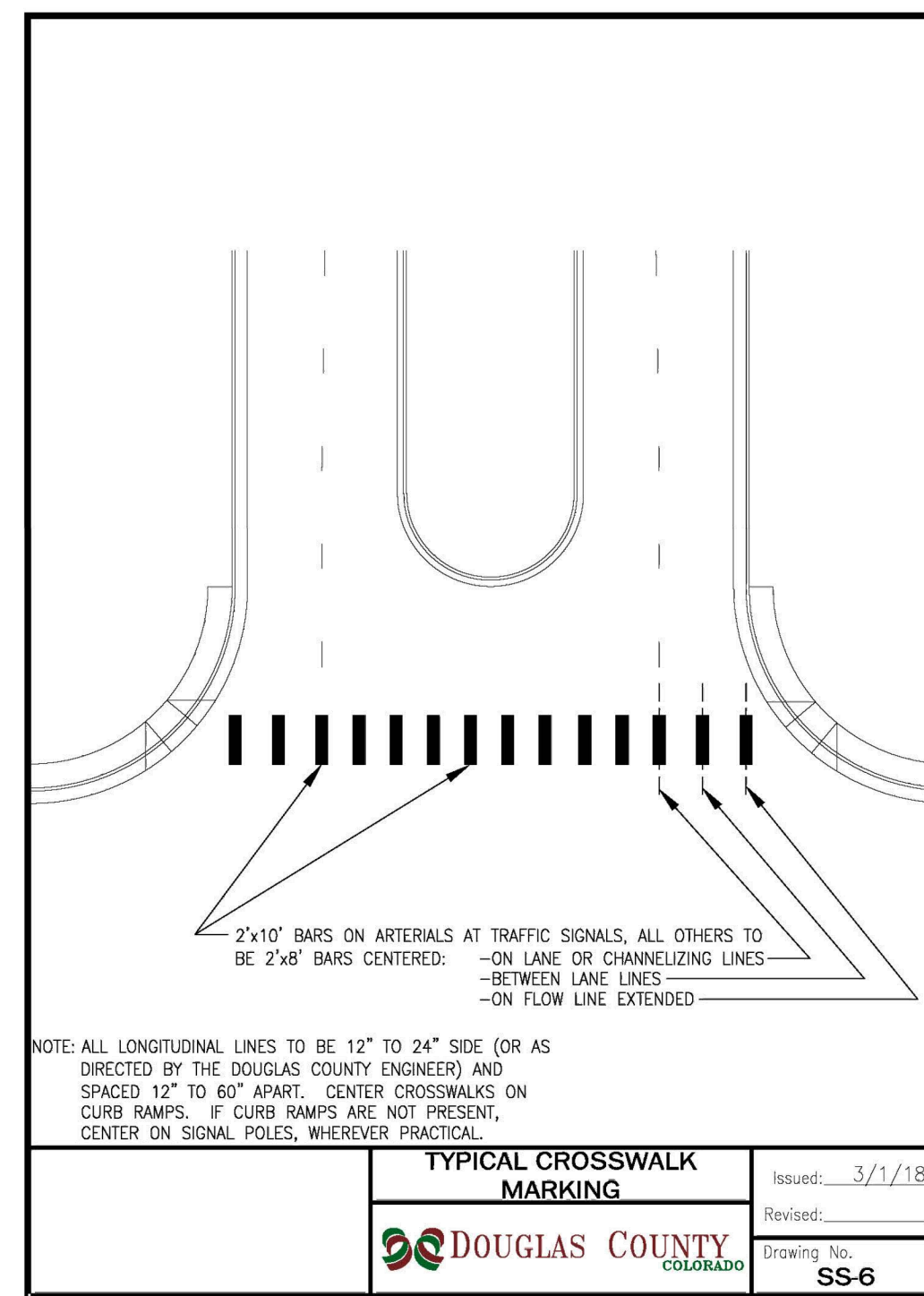
GROUND MOUNTED STREET NAME SIGN DETAIL
 Issued: 3/1/18
 Revised:
 Drawing No. SS-3



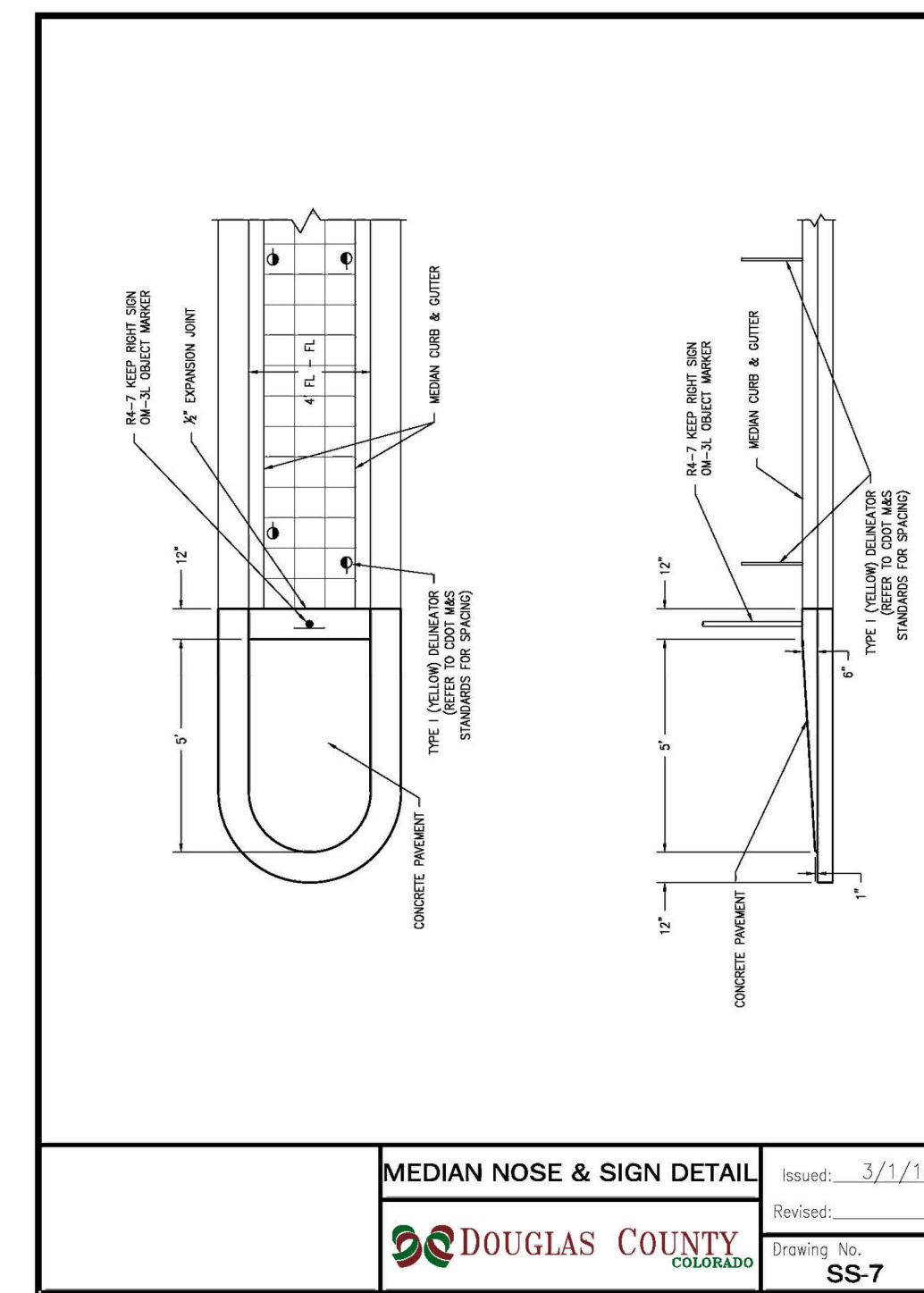
TYPICAL LOCATIONS-STOP SIGNS AND YIELD SIGNS
 Issued: 3/1/18
 Revised:
 Drawing No. SS-4



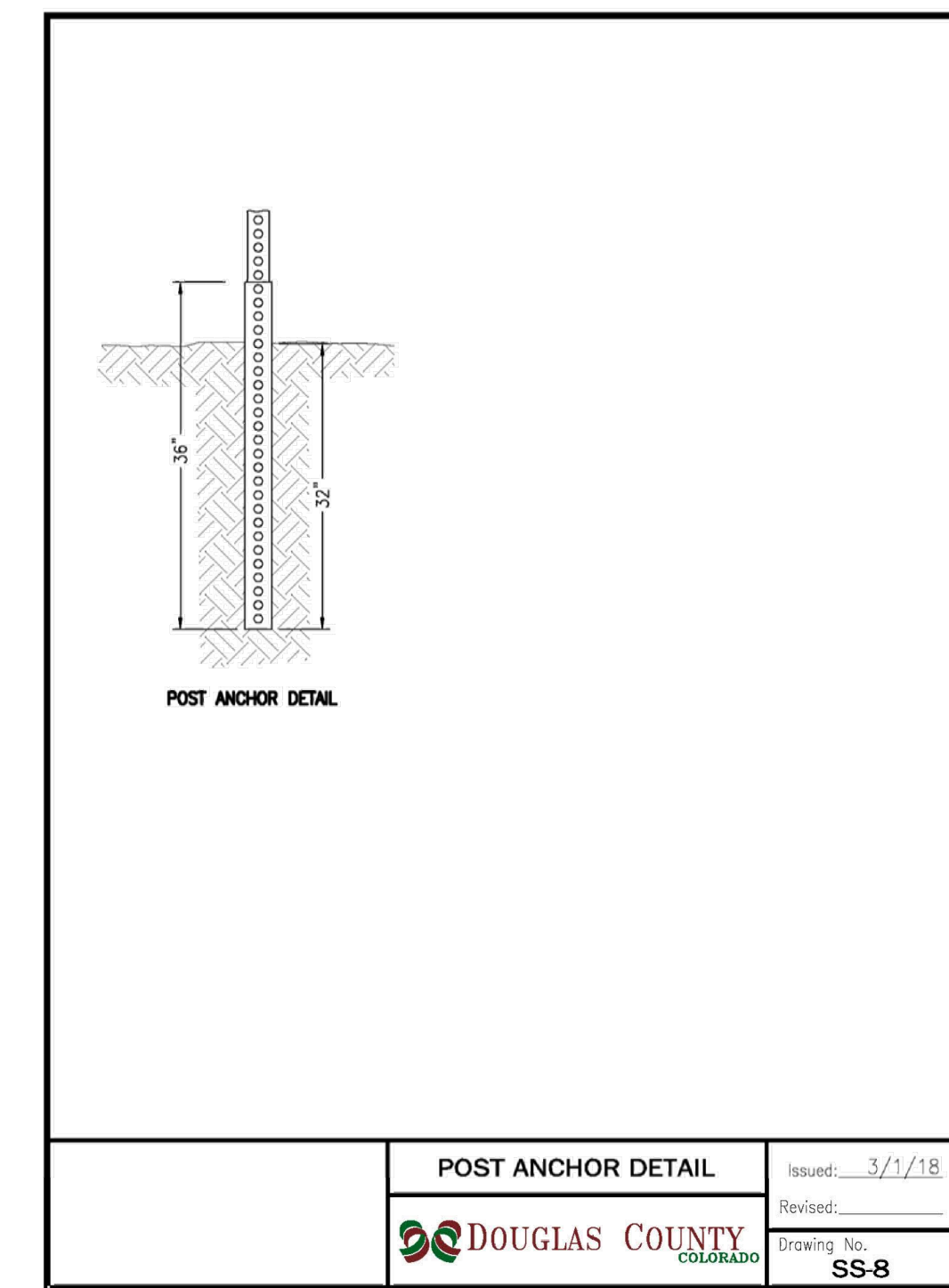
TYPICAL 'NO OUTLET' AND 'DEAD END' SIGN PLACEMENT
 Issued: 3/1/18
 Revised:
 Drawing No. SS-5



TYPICAL CROSSWALK MARKING
 Issued: 3/1/18
 Revised:
 Drawing No. SS-6



MEDIAN NOSE & SIGN DETAIL
 Issued: 3/1/18
 Revised:
 Drawing No. SS-7



POST ANCHOR DETAIL
 Issued: 3/1/18
 Revised:
 Drawing No. SS-8

INDEX OF REVISIONS

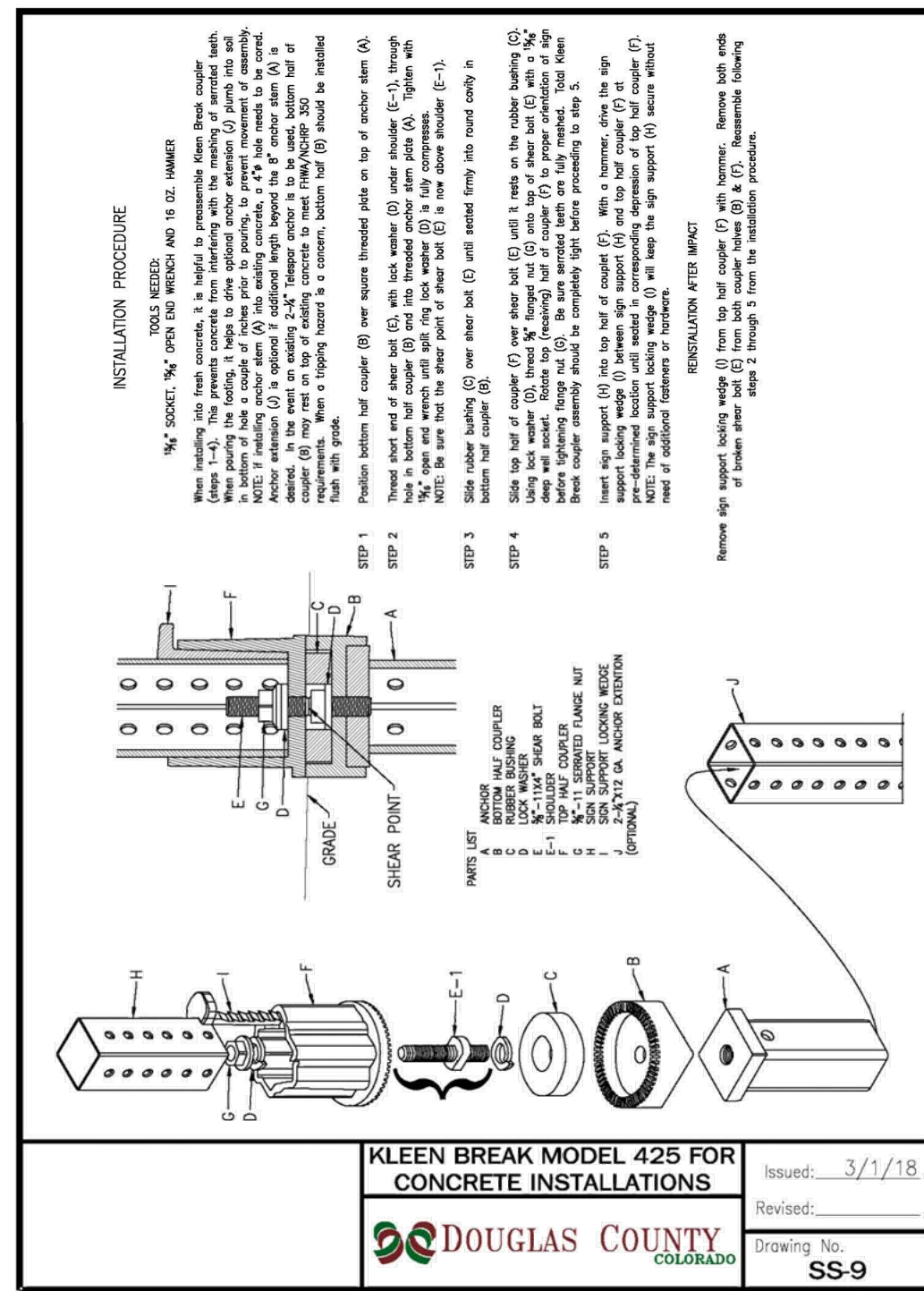
Rev.	Date	Description
1	5/18	REISSUE

DOUGLAS COUNTY COLORADO
 Engineering Division
 100 Third Street
 Castle Rock, Colorado 80104
 (303) 660-7490

SIGNING AND STRIPING SUPPLEMENT
PAGE 9-16
 SIGNAGE AND STRIPING SUPPLEMENT

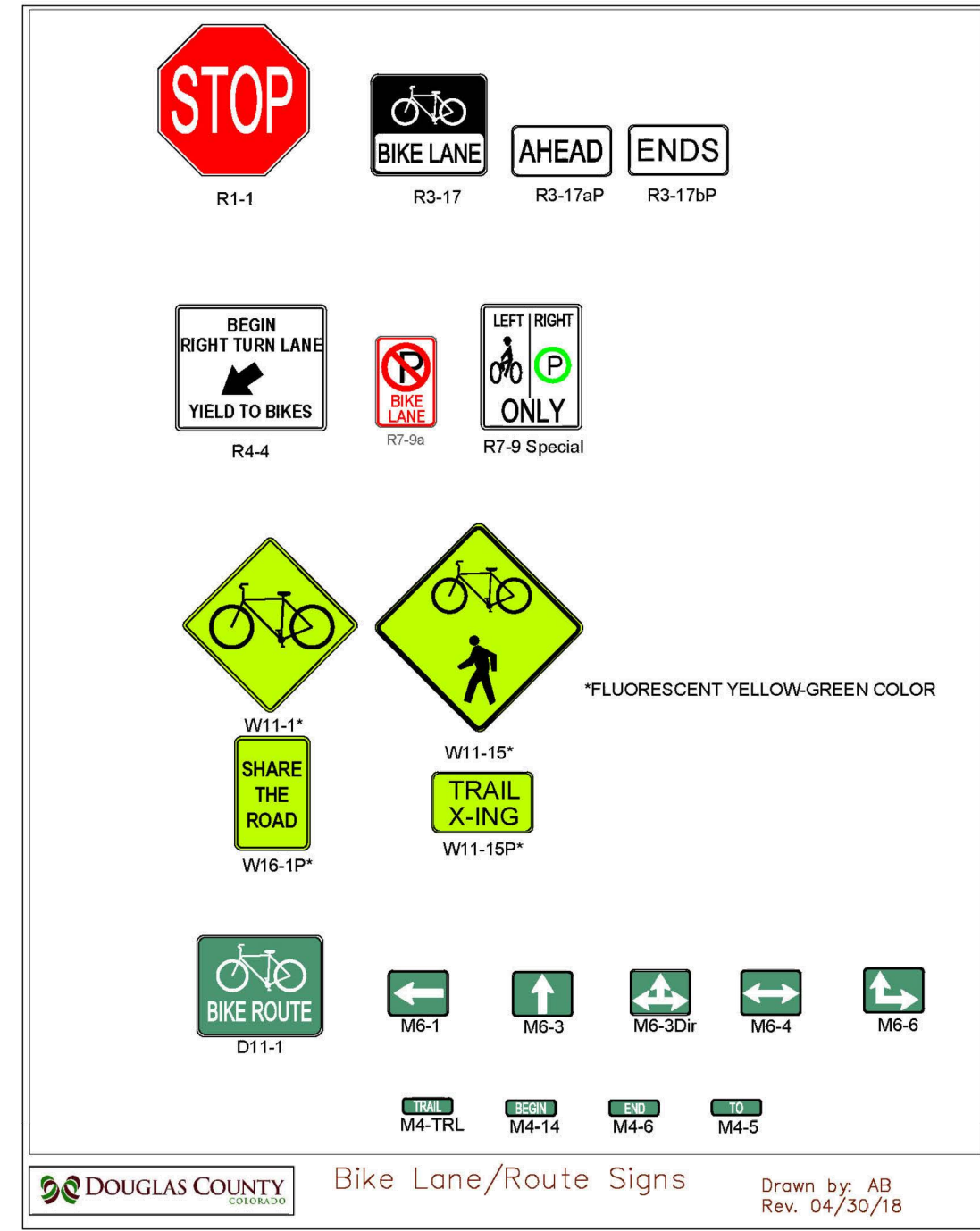
Design	Drawn	Checked	Date	Scale	Job No.
			6/03	N/A	

Appendix G – Signage and Striping Supplement



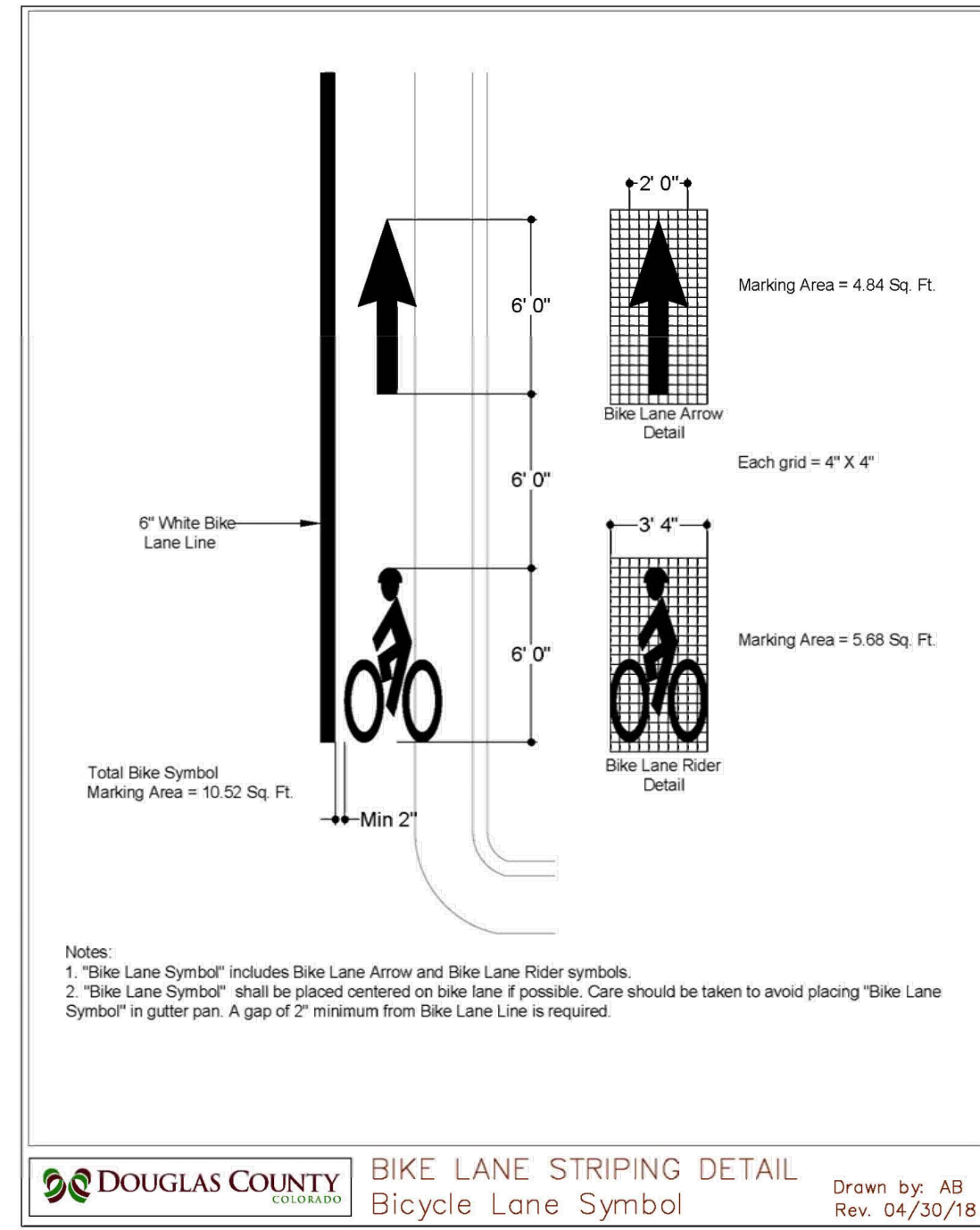
KLEEN BREAK MODEL 425 FOR CONCRETE INSTALLATIONS
 Issued: 3/1/18
 Revised:
 Drawing No. SS-9
 DOUGLAS COUNTY COLORADO

Appendix G – Signage and Striping Supplement



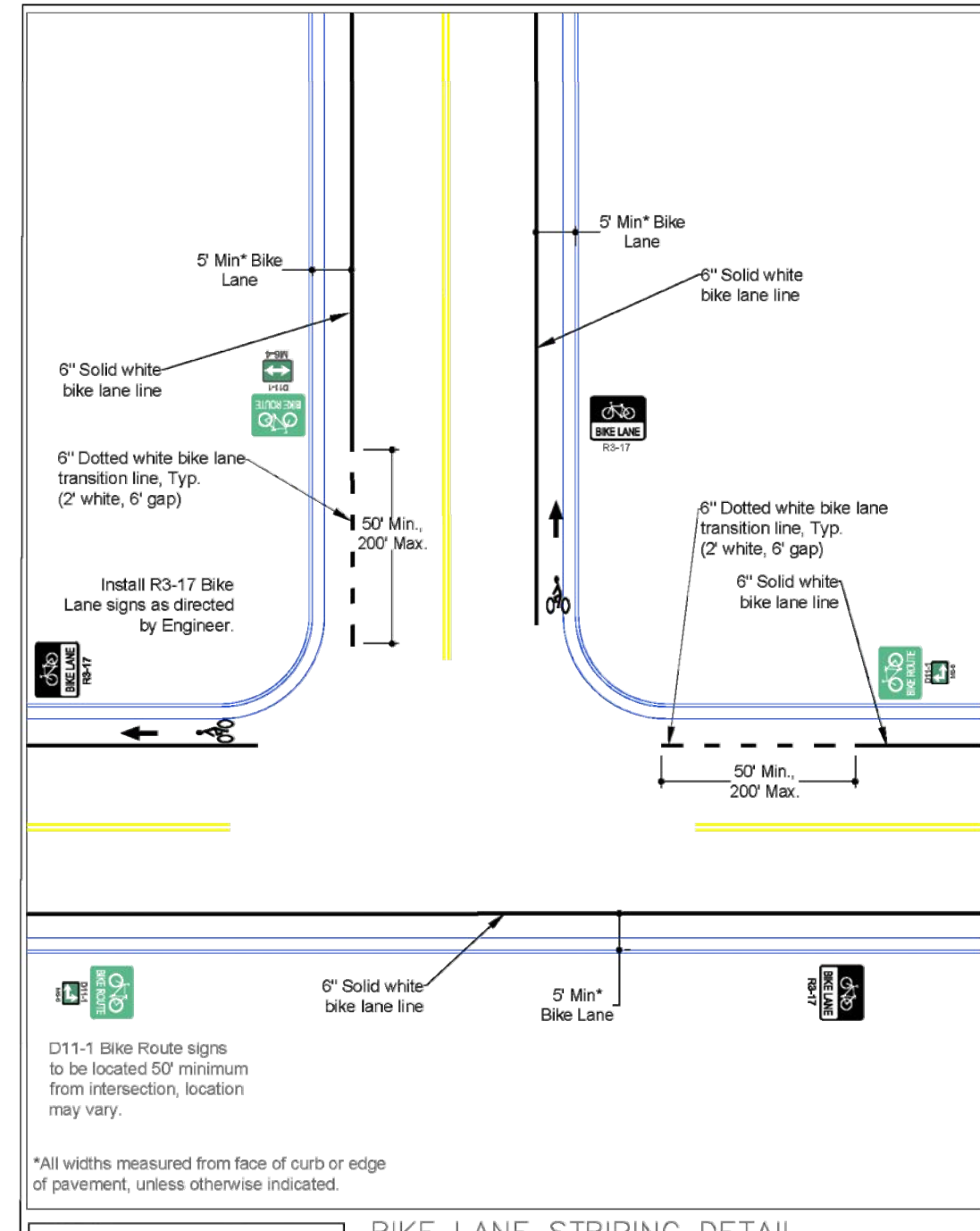
Bike Lane/Route Signs
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

Appendix G – Signage and Striping Supplement



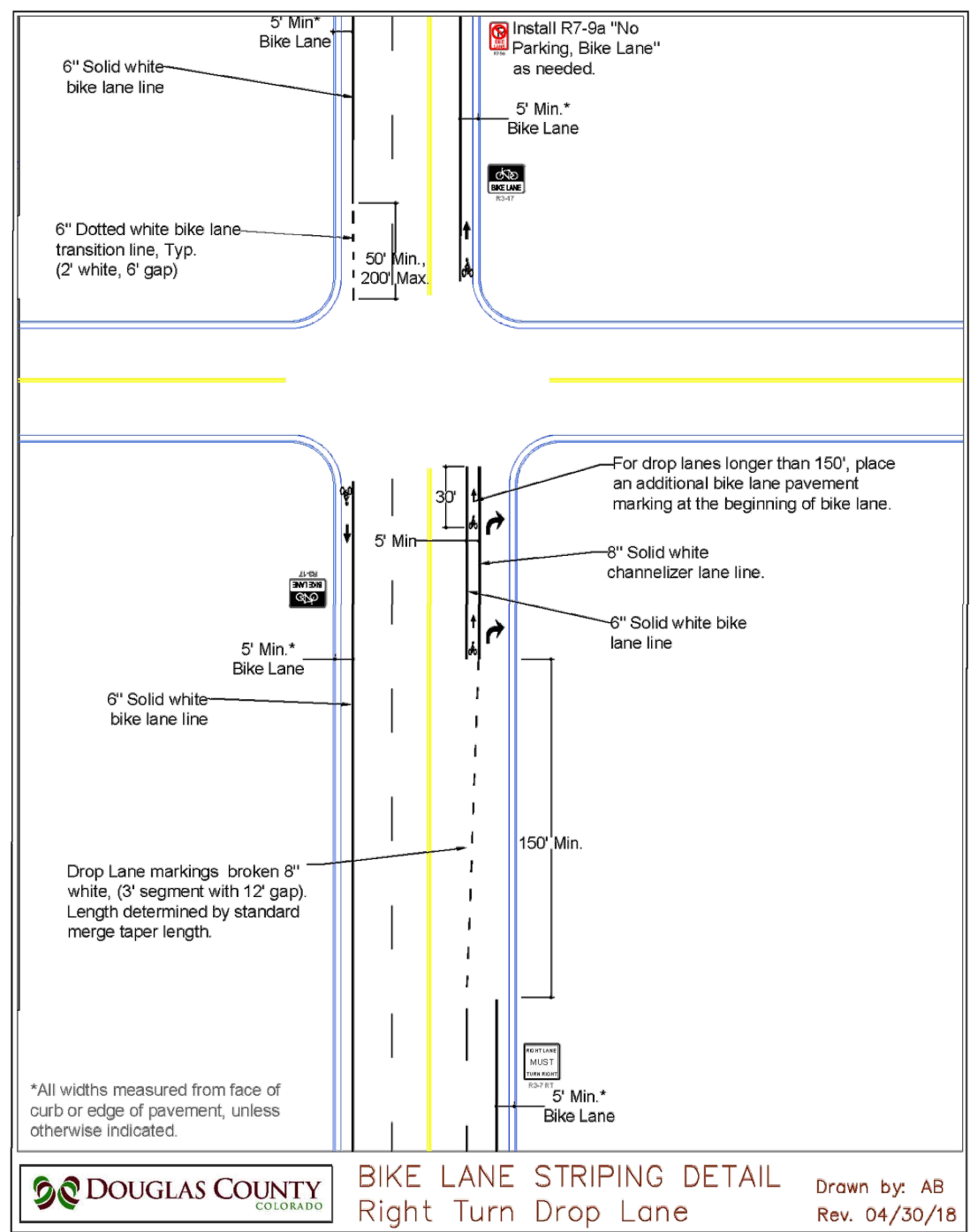
BIKE LANE STRIPING DETAIL Bicycle Lane Symbol
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

Appendix G – Signage and Striping Supplement



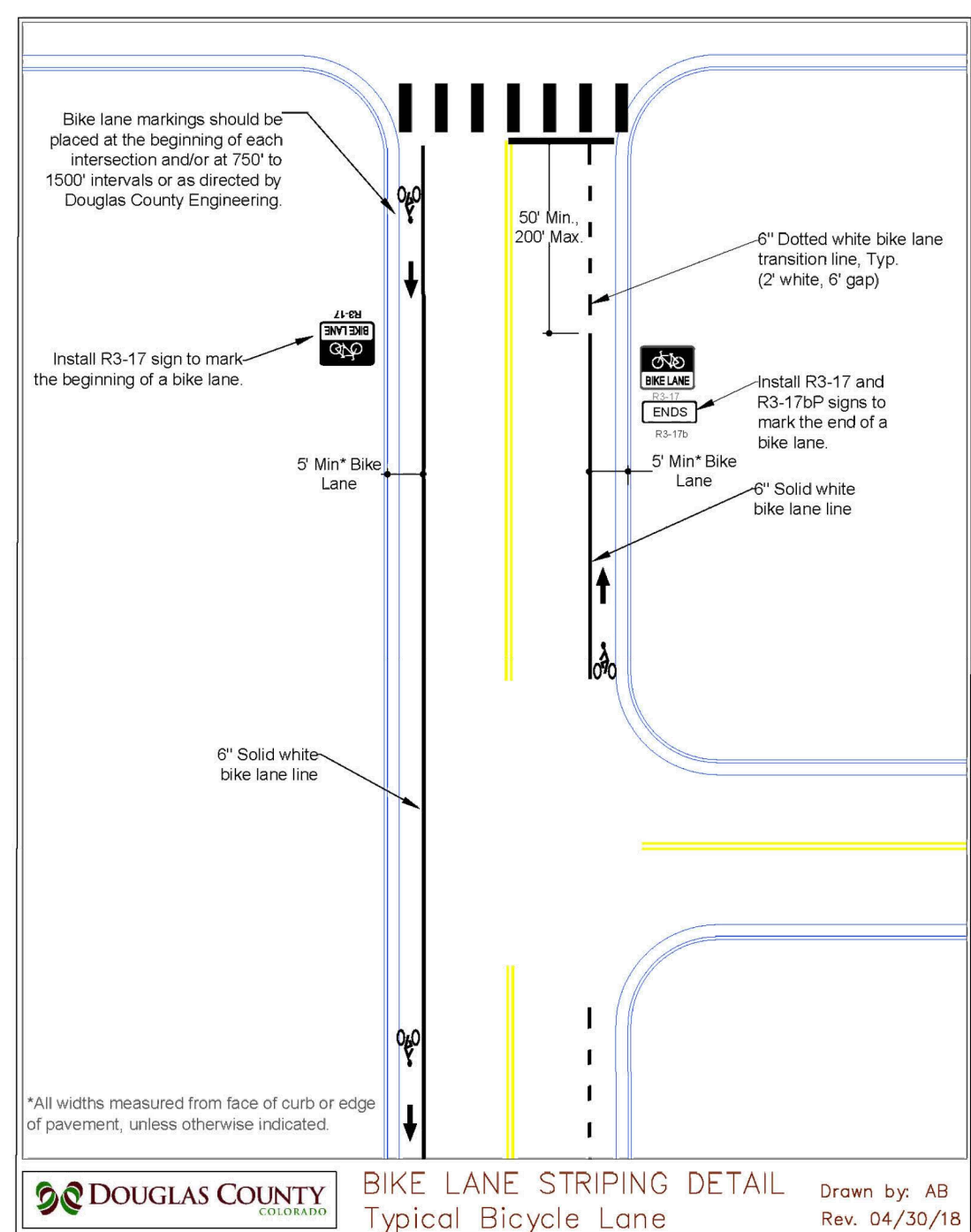
BIKE LANE STRIPING DETAIL T-Intersection
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

Appendix G – Signage and Striping Supplement



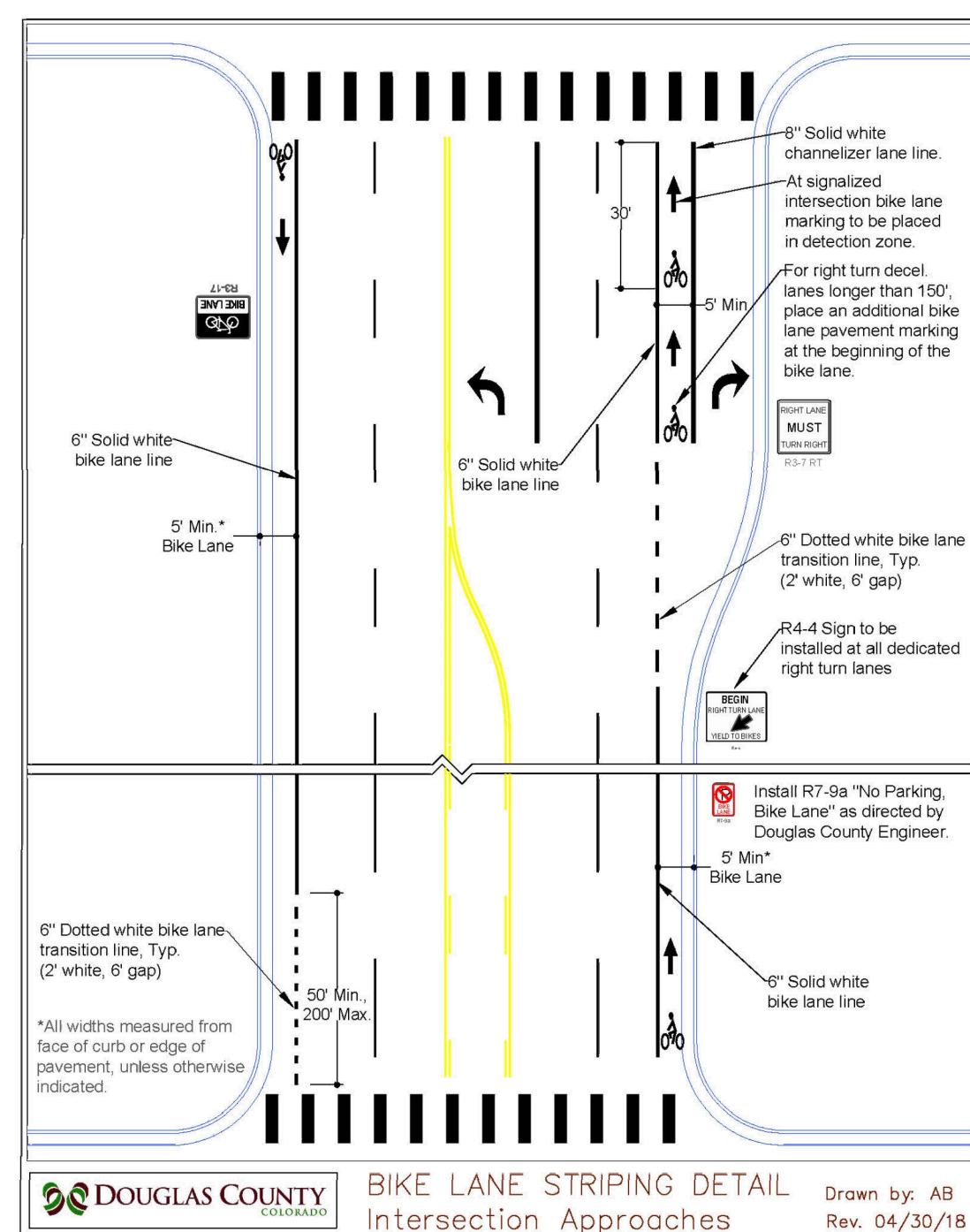
BIKE LANE STRIPING DETAIL Right Turn Drop Lane
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

Appendix G – Signage and Striping Supplement



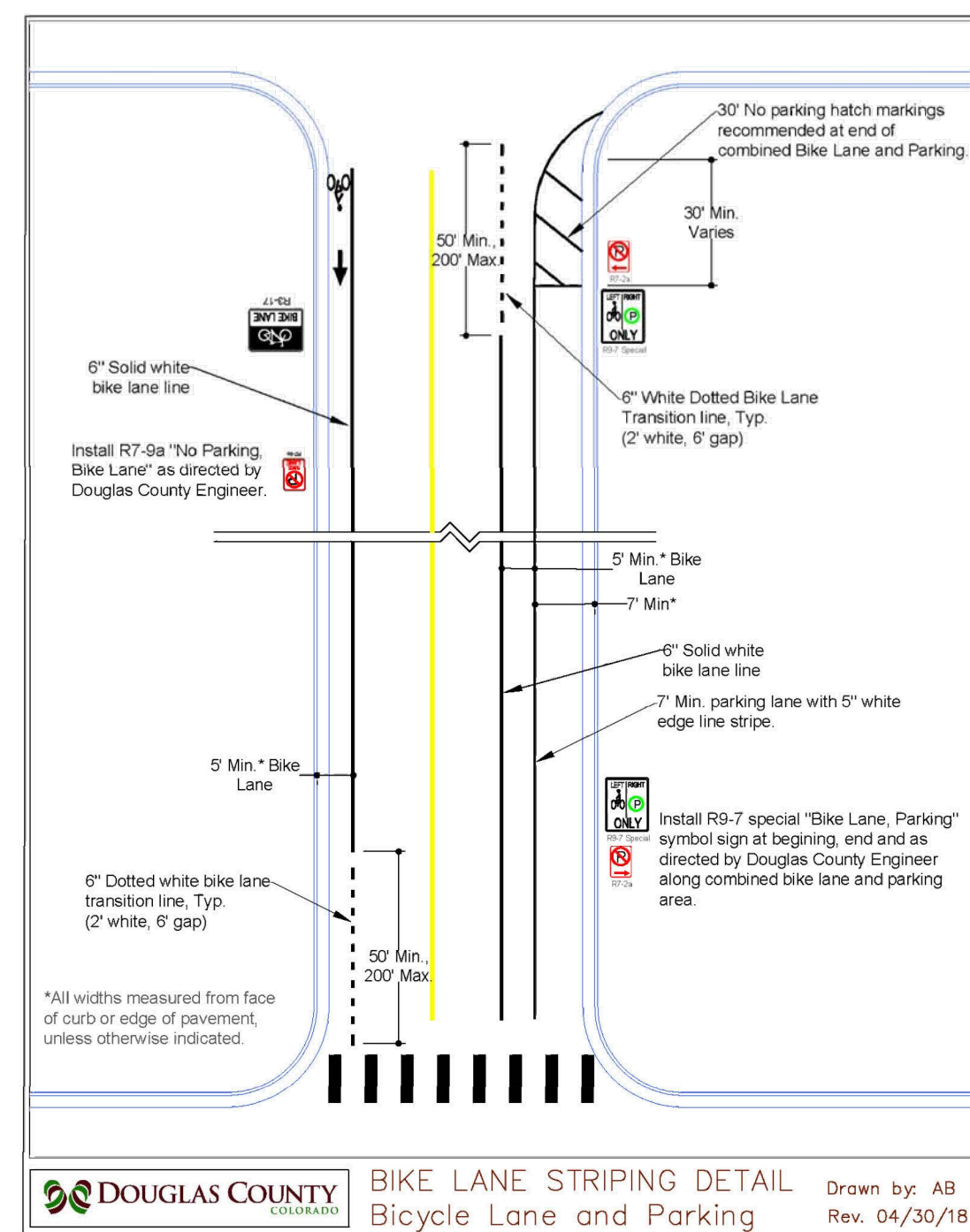
BIKE LANE STRIPING DETAIL Typical Bicycle Lane
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

Appendix G – Signage and Striping Supplement



BIKE LANE STRIPING DETAIL Intersection Approaches
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

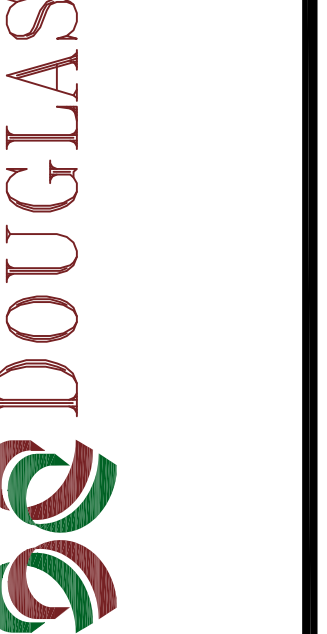
Appendix G – Signage and Striping Supplement



BIKE LANE STRIPING DETAIL Bicycle Lane and Parking
 Drawn by: AB
 Rev. 04/30/18
 DOUGLAS COUNTY COLORADO

INDEX OF REVISIONS	Rev.	Date	Description
1	5/18	REISSUE	

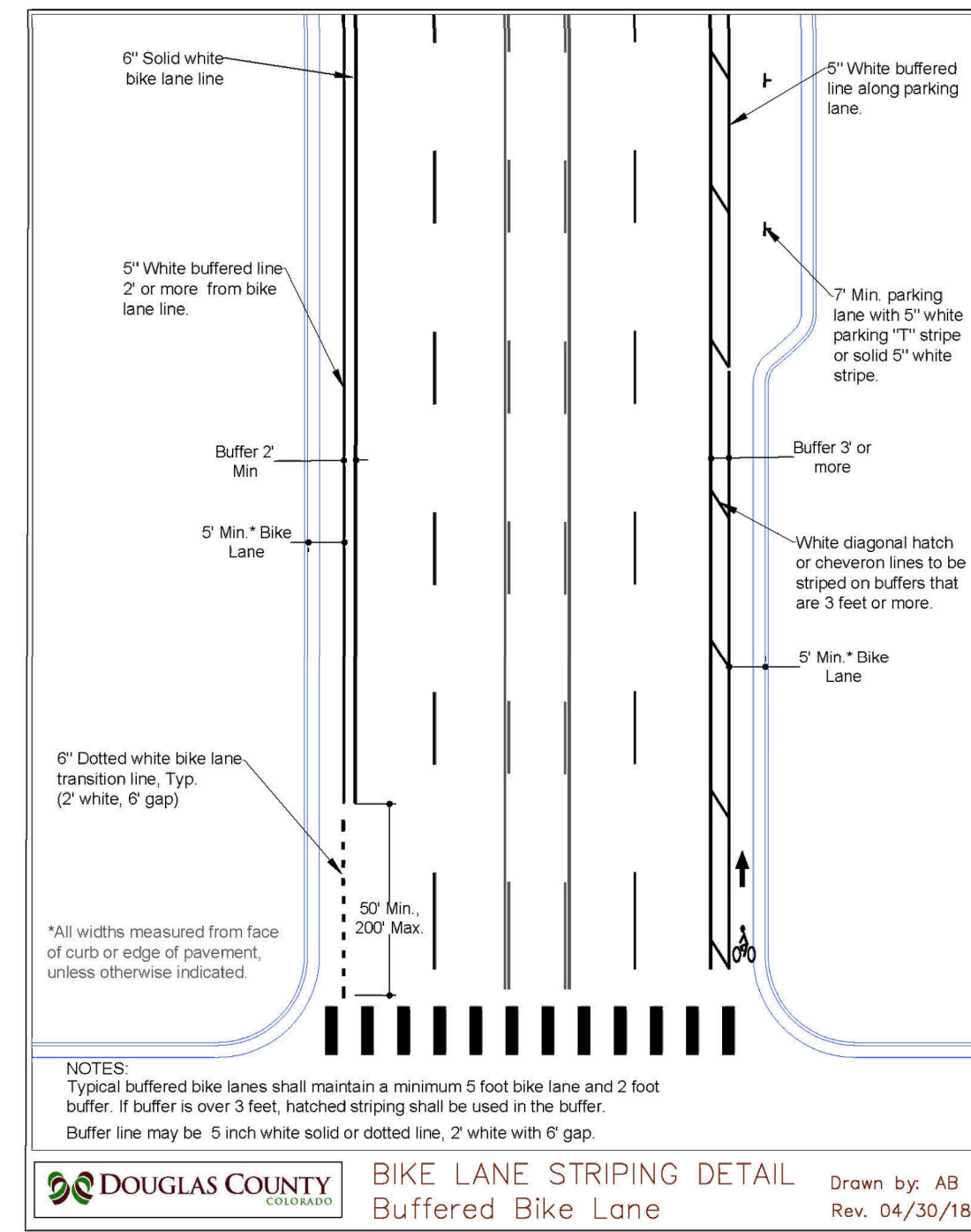
DOUGLAS COUNTY COLORADO
 Engineering Division
 100 Third Street
 Castle Rock, Colorado 80104
 (303) 660-7490



SIGNING AND STRIPING SUPPLEMENT PAGE 17-24

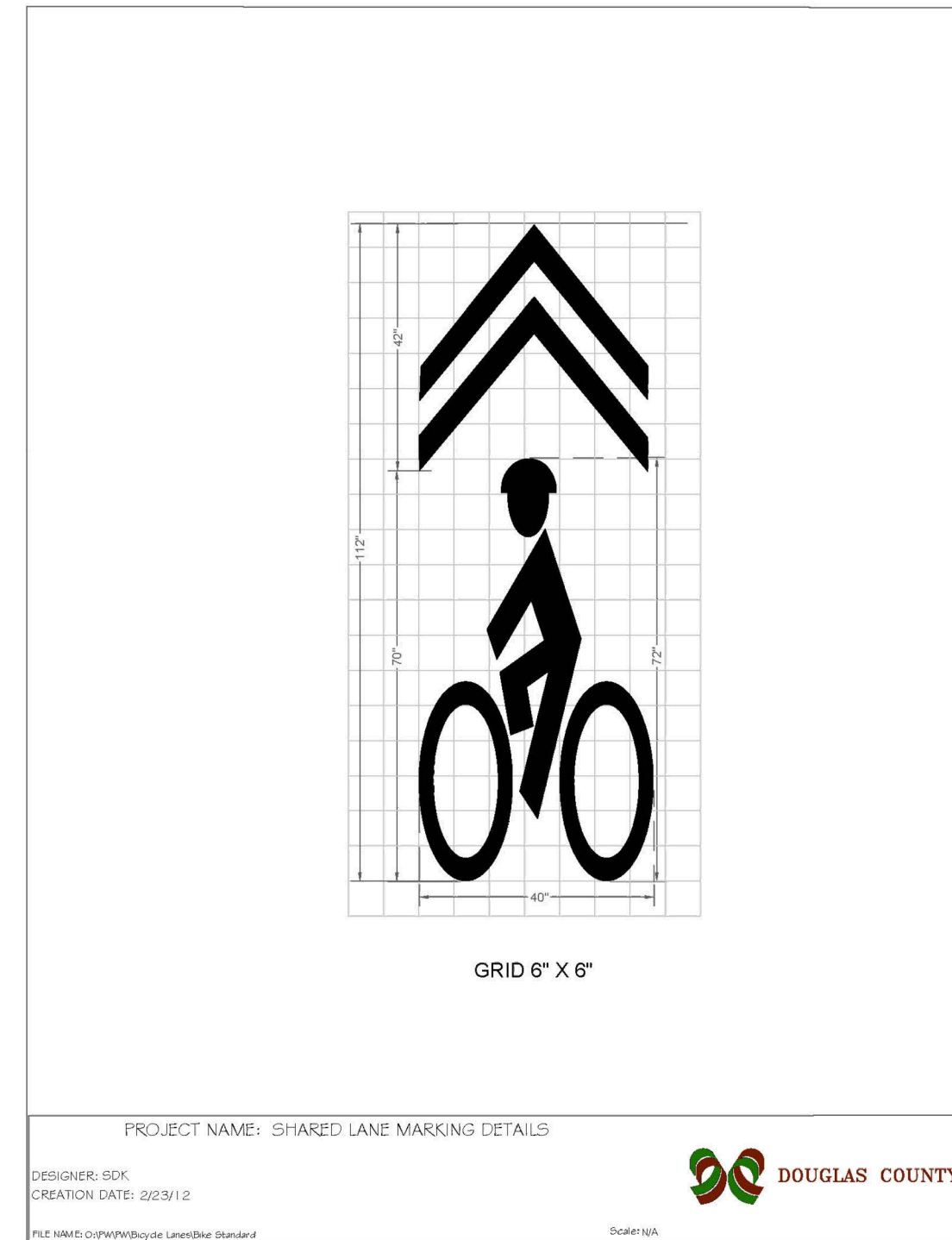
Design	Drawn	Checked	Date	Scale	Job No.
BLS			6/03	N/A	

Appendix G – Signage and Striping Supplement



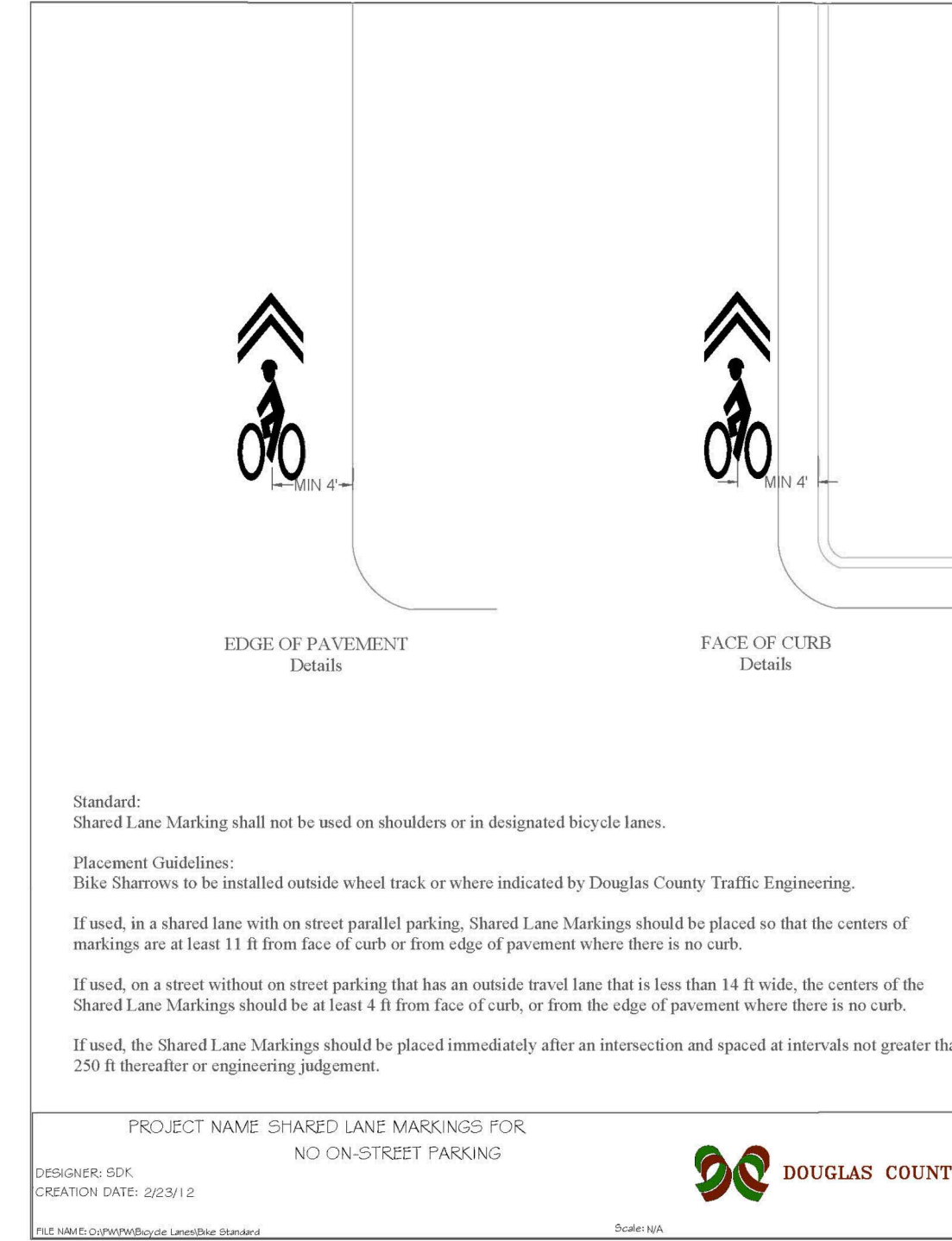
SS-17

Appendix G – Signage and Striping Supplement



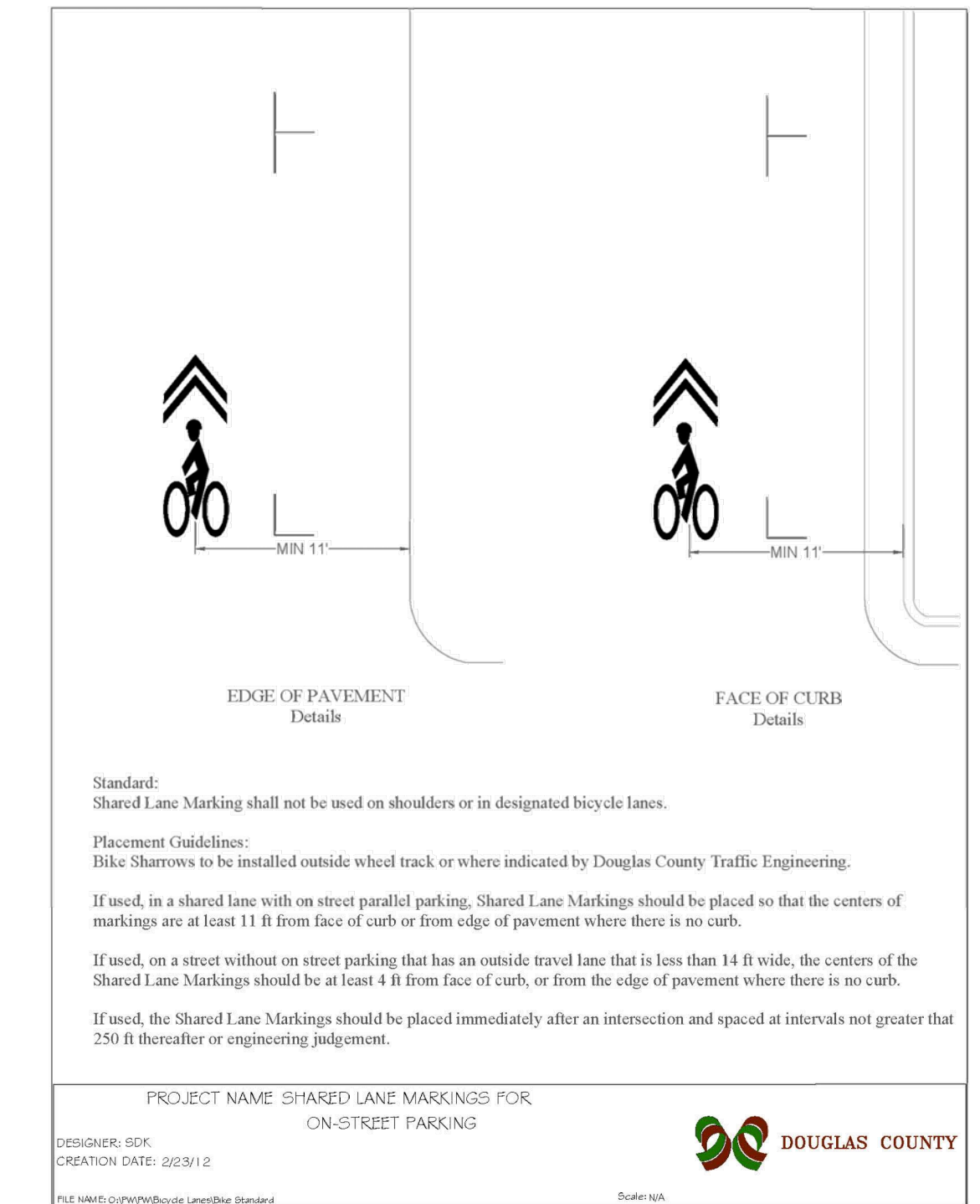
SS-18

Appendix G – Signage and Striping Supplement



SS-19

Appendix G – Signage and Striping Supplement



SS-20

Rev.	Date	Description
1	5/18	REISSUE

DOUGLAS COUNTY COLORADO
Engineering Division
100 Third Street
Castle Rock, Colorado 80104
(303) 660-7490

SIGNING AND STRIPING SUPPLEMENT
PAGE 25-28

Design	BLS
Drawn	
Checked	6/03
Date	N/A
Scale	
Job No.	