



Florida Department of Transportation

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ROADWAY DESIGN BULLETIN 19-05
PROGRAM MANAGEMENT BULLETIN 19-04
(FHWA Approved: 8/1/19)

DATE: August 8, 2019

TO: District Directors of Transportation Operations, District Directors of Transportation Development, District Design Engineers, District Consultant Project Management Engineers, District Construction Engineers, District Structures Design Engineers, District Maintenance Engineers, District Roadway Design Engineers, District Traffic Operations Engineers, Program Management Engineers, District Materials Engineers

FROM: Michael Shepard, P.E., State Roadway Design Engineer
Stefanie D. Maxwell, P.E., Manager, Program Management Office

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Michael Shepard
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COPIES: Courtney Drummond, Will Watts, Tim Lattner, Rudy Powell, Amy Tootle, Paul Hiers, Robert Robertson, Trey Tillander, Dan Hurtado, Erik Fenniman, Nick Finch (FHWA), Rafiq Darji (FHWA), Chad Thompson (FHWA), Bren George (FHWA)

SUBJECT: **Directional Tactile Walking Surface Indicator (Directional Indicator)**

This Design Bulletin revises **FDOT Design Manual (FDM) 213** and introduces **Developmental Specification Dev528** and **Developmental Standard Plans (DSP) Index D528-001**, with its **Developmental Standard Plans Instructions (DSPI)**. These new developmental documents are available on the **Developmental Specifications** and **Standard Plans** websites.

REQUIREMENTS

1. Replace the last 3 paragraphs in **FDM 213.8.2** and **Figures 213.8.1-213.8.2** with the following:

Figure 213.8.1 illustrates the geometrics for a bicycle ramp when a utility strip of at least 5-feet is present. The desired angle between the ramp and the roadway ranges from 20 to 25 degrees; however, angle is not to exceed 35 degrees.

Figure 213.8.2 illustrates the geometrics for a bicycle ramp when sidewalk on the approach leg is adjacent to, or near the back of curb.

Place Directional Tactile Walking Surface Indicator (a.k.a., Directional Indicator) at the top of the bicycle ramp to provide a tactile cue for visually impaired pedestrians to continue down the sidewalk. Do not place detectable warning surfaces on the bicycle ramp. See *Developmental Specification Dev528* and Developmental Standard Plans (*DSP*) *Index D528-001* for additional requirements.

Figure 213.8.1 Angled Bicycle Ramp

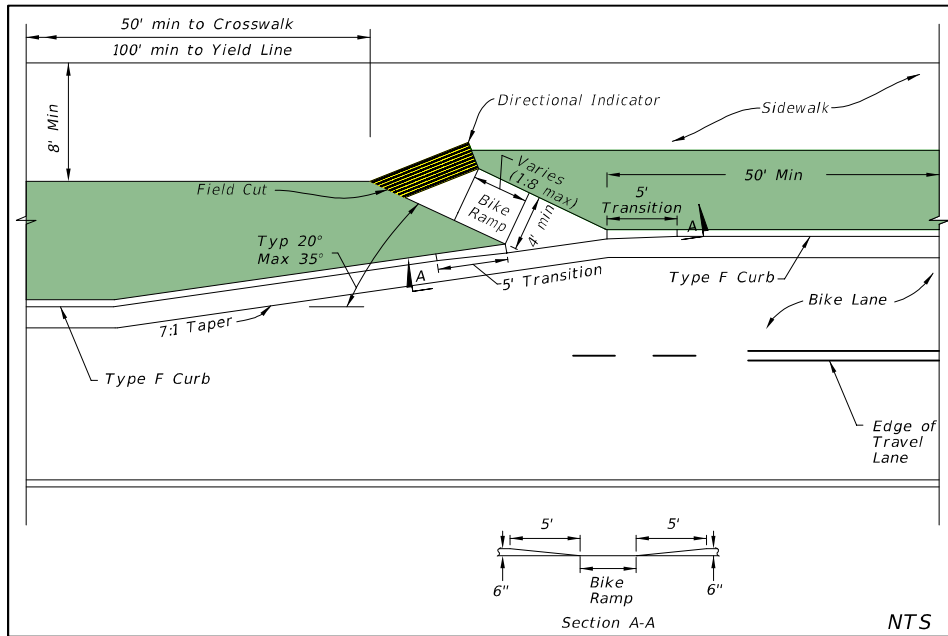
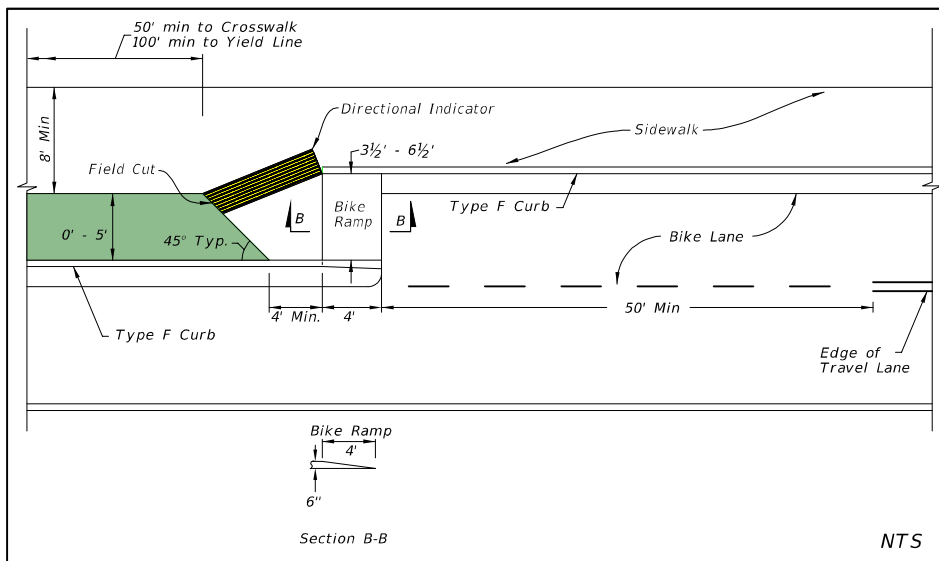


Figure 213.8.2 Straight Bicycle Ramp



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2. ***DSP Index D528-001*** and ***Developmental Specification Dev528*** have been released. They provide details and placement requirements for Directional Indicators at roundabouts with bicycle ramps. See Attachment ‘A’ for ***Developmental Specification Dev528*** and ***DSP, Index D528-001***.
3. The ***Basis of Estimates Manual*** has been revised to include the pay item **919-528** for Directional Indicators.

COMMENTARY

Many other countries currently use Directional Indicators (known as “guiding patterns of tactile walking surface indicators”) in buildings, sidewalks, and rail stations. The requirements for Directional Indicators are based on the ***International Standard (ISO) 23599, Assistive products for blind and vision impaired persons – Tactile walking surface indicators***.

BACKGROUND

Bicycle ramps near roundabouts may be confusing to pedestrians with visual impairments. Directional Indicators are intended to minimize confusion by redirecting pedestrians with visual impairments away from bicycle ramps and guide them to stay on the sidewalk. Directional Indicators are designed to be detectable by cane, underfoot, and visual contrast with surrounding pavement.

IMPLEMENTATION

The use of Directional Indicators as specified in ***FDM 213.8.2, Developmental Specification Dev528***, and ***DSP, Index D528-001*** is required for all applicable projects being designed with the ***2019 FDM*** where implementation will not adversely impact production schedules. All projects including Directional Indicators must be submitted to the State Roadway Design Office (i.e., the Central Office Monitor) for review and approval. Follow the Usage Process as outlined in ***FDM 115.2.4***, and see Attachment ‘A’ for ***Developmental Specification Dev528*** and ***DSP, Index D528-001***.

The product drawings will be listed on FDOT’s Innovative Products List (IPL) Website as they become available.

Insert ***DSP Index D528-001*** into the Plans as described in ***FDM 302.9*** for projects approved for use of Directional Indicators.

The ***Developmental Specification Dev528*** must be requested through the District Specifications Office.

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ATTACHMENT 'A'

DIRECTIONAL TACTILE WALKING SURFACE INDICATORS.
(REV 8-6-19)

The following new Section is inserted after Section 527:

SECTION 528
DIRECTIONAL TACTILE WALKING SURFACE INDICATORS

528-1 Description.

Furnish and install directional tactile walking surface indicators (directional indicators) on concrete or asphalt walking surfaces in accordance with the Plans, this Section and Developmental Standard Plan, Index 528-001.

528-2 Materials.

Directional indicators must consist of materials intended for exterior use subject to routine pedestrian traffic. Use directional indicators consisting of weather-resistant tiles, pavers or panels that are cast into concrete, or panels or mats that are surface applied to concrete or asphalt surfaces with adhesives and mechanical fasteners. Do not form directional indicators in wet concrete.

Directional indicators meeting the requirements of this Section are listed on the Department's Innovative Product List (IPL). Manufacturers may submit products for inclusion on the IPL.

528-2.1 Material Properties: Directional indicators must meet the following requirements:

Property	Standard	Test Value
Slip Resistance	FM 3-C1028	Dry Coefficient of Friction – 0.8 min. Wet Coefficient of Friction – 0.65 min.
Wear Resistance	FM 5-594	Average Volume Loss: no more than 0.06 cm ³
Water Absorption*	ASTM D570	Not to exceed 5%.
Adhesion/Bond Strength**	FM 5-589	150 psi min. tensile adhesion strength
Non-Hazardous Classification	Submit Material Safety Data Sheet (SDS)	Non-Hazardous, per RCRA Subtitle C
Dimensions	ISO 23599	Meet criteria in ISO 23599, section 4.1.3.2
* Applies only to plastic materials. ** Applies to surface-applied materials.		

528-2.2 Color/Contrast: Use safety yellow, brick red or black colored directional indicators on concrete walking surfaces. Use safety yellow colored directional indicators on asphalt walking surfaces. Acceptable materials must meet the following criteria for a duration of three years.

Color	Light Reflectance Values (LRV) CAP Y*
Safety Yellow	25 – 45
Brick Red	5 – 15
Black	0 – 5

*When measured with a spectrophotometer

528-3 Installation Procedures.

528-3.1 Surface Preparation and Installation: Prepare the surface in accordance with the manufacturer's recommendations. Use only products and materials appropriate for the surface on which they will be applied. Install in accordance with the manufacturer's instructions, using materials and equipment recommended and approved by the manufacturer. For surface-applied panels or mats, use adhesives applied over the entire surface and mechanical fasteners.

528-3.2 Cutting Directional Indicators: Edges must maintain factory edges for all pedestrian approaches. Cutting of directional indicators allowed only on edges not approachable by pedestrians.

528-4 Method of Measurement.

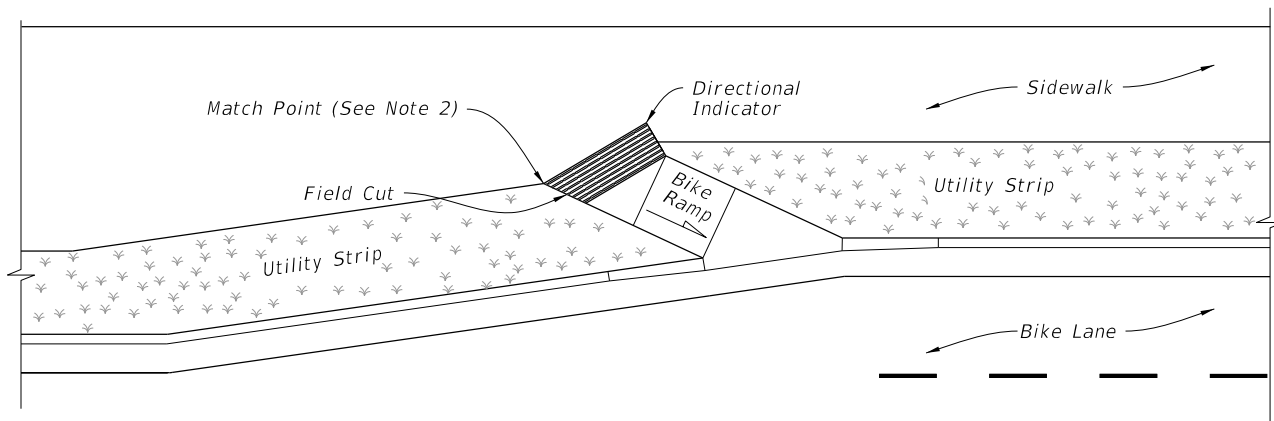
The quantity to be paid for will be the plan quantity, in square feet, for directional indicators, completed and accepted.

528-5 Basis of Payment.

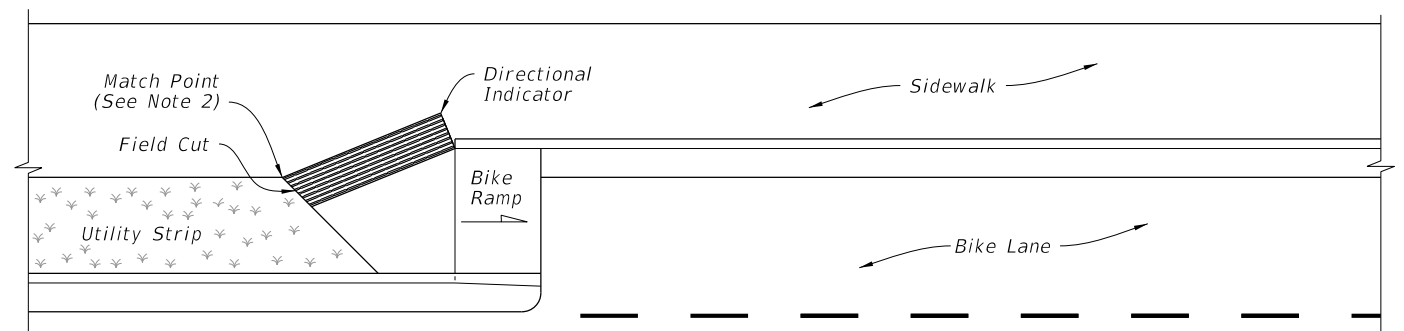
Price and payment will be full compensation for all work specified in this Section, including all materials, equipment, labor, surface preparation, and incidentals necessary to complete the work.

Payment will be made under:

919-528- A Directional Indicators – per square foot



ANGLED BICYCLE RAMP



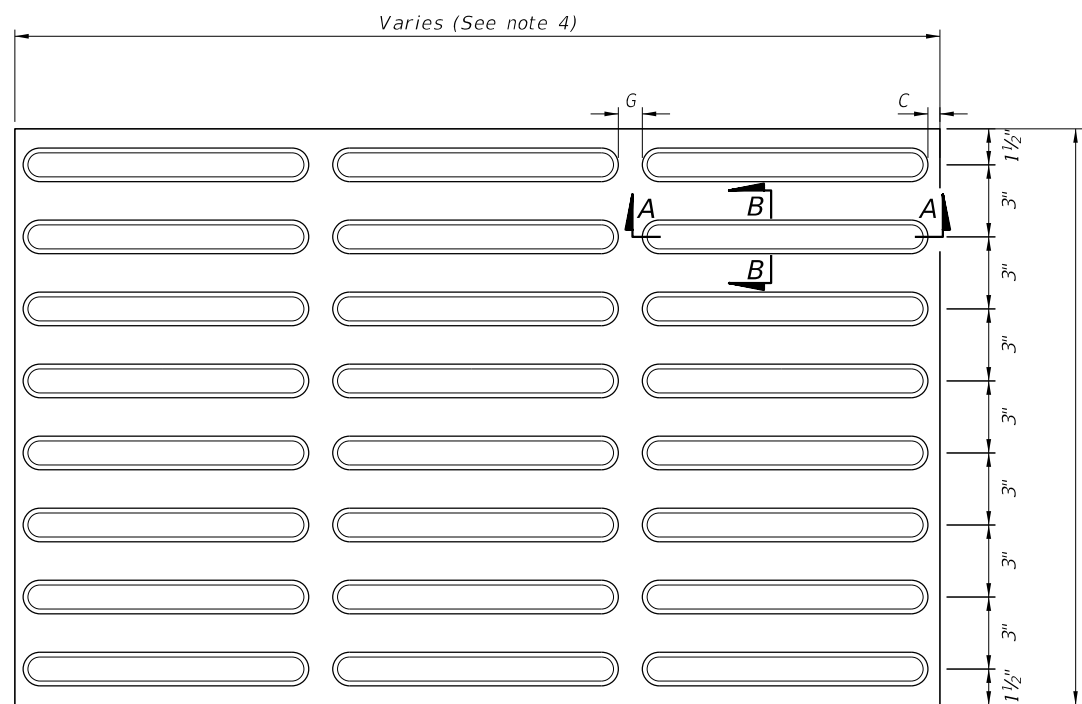
STRAIGHT BICYCLE RAMP

TYPICAL PLACEMENT ON BICYCLE RAMPS

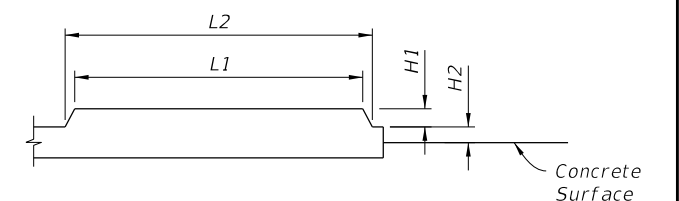
NOTES:

1. Construct Bicycle Ramp and locate Directional Tactile Walking Surface Indicator (Directional Indicator) as shown in the Plans. Extend Directional Indicators the full length of the bicycle ramp width.
2. Cut Directional Indicators to match skewed edges as shown.
3. Install Directional Indicators in accordance with Developmental Specification Dev528.
4. Panel lengths can vary based on vendor requirements and are not limited to three rows of raised bars as shown.
5. Panel widths can vary based on vendor requirements. Multiple panels can be placed side-by-side to achieve the overall 2'-0" width.

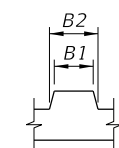
Dimension	Range (in.)
B1	0.70 to 1.00
B2	B1 + 0.40
C	1/2 G
G	0.70 to 1.20
H1	0.18 to 0.20
H2	0.12 Max.
L1	10.70 to 12.00
L2	L1 + 0.40



PLAN



SECTION A-A



SECTION B-B

DIRECTIONAL INDICATOR DETAILS

8/6/2019 8:39:00 AM

LAST REVISION	DESCRIPTION:
08/08/19	



DEVELOPMENTAL STANDARD PLANS

DIRECTIONAL INDICATOR

INDEX
D528-001

SHEET
1 of 1

Index D528-001 Directional Indicator

Design Criteria

FDOT Design Manual (FDM); International Standard (ISO) 23599, Assistive Products for blind and vision-impaired persons – Tactile walking surface indicators

Design Assumptions and Limitations

For usage information, see [FDM 213](#).

Directional Indicators (a.k.a., Directional Tactile Walking Surface Indicators) must have rounded or beveled edges on all sides except for sidewalk edges adjacent to utility strips (with grass or other vegetation). This will decrease tripping and improve safety for people with mobility impairments.

Provide a continuous linear pattern where possible to ensure the vision impaired can follow guiding patterns (Directional Indicator bars).

The width of Directional Indicator mats must not be less than 2 feet when approached by pedestrians at an angle. This is necessary to improve detection for the vision impaired (i.e., someone using a guide dog or white cane to negotiate the sidewalk).

Plan Content Requirements

Summary Boxes:

Summarize quantities in the Summary of Sidewalk and Detectable Warnings. See Example A: Summary of Sidewalk and Detectable Warnings with Directional Indicators.

Roadway Plan Views:

1. Location (Station)
2. Side (either Left or Right)

Payment

Item number	Item Description	Unit Measure
919-528	Directional Indicators	SF

See the Basis of Estimates Manual (BOE) and Developmental Specifications Dev528 for additional information on payment, pay item use, and compensation.

Payment includes the cost of furnishing and installing Directional Indicators for new construction or retrofit. All incidental items are included in the pay item for Directional Indicators, SF.

EXAMPLE A: SUMMARY OF SIDEWALK AND DETECTABLE WARNINGS

SUMMARY OF SIDEWALK & DETECABLE WARNINGS														
LOCATION	SIDE	AREA ID	LENGTH	WIDTH	CONC SIDEWALK 4"			DETECTABLE WARNINGS			DIRECTIONAL INDICATORS		DESIGN NOTES	CONSTRUCTION REMARKS
					0522 1			0527 2			919 528			
STA. TO STA.	SF			SF			SF							
	P	F		P	F		P	F						
SUB-TOTAL:														
TOTAL:														

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	