



Back-to-Basics: ADA Ramps

PRESENTED BY:
DANIELLE DEROLF, P.E.

TUESDAY, NOVEMBER 4,
2025

About Me

- PSU Class of 2018 
- Kimley-Horn (Reston) → Kimley-Horn (Harrisburg) → Dawood → Bowman
- ASHE Harrisburg 1st Vice President



ASHE

- Become a member! Only \$60/year 😊
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Back-to-Basics Topics Still Needed!

- Construction Phase Services
- E&S
- Guiderail
- HOP Process
- MPT
- Project Delivery Process
- Project Management
- Roadway
- Structures
- Traffic Studies
- Utilities & Right-of-Way

Topic Descriptions



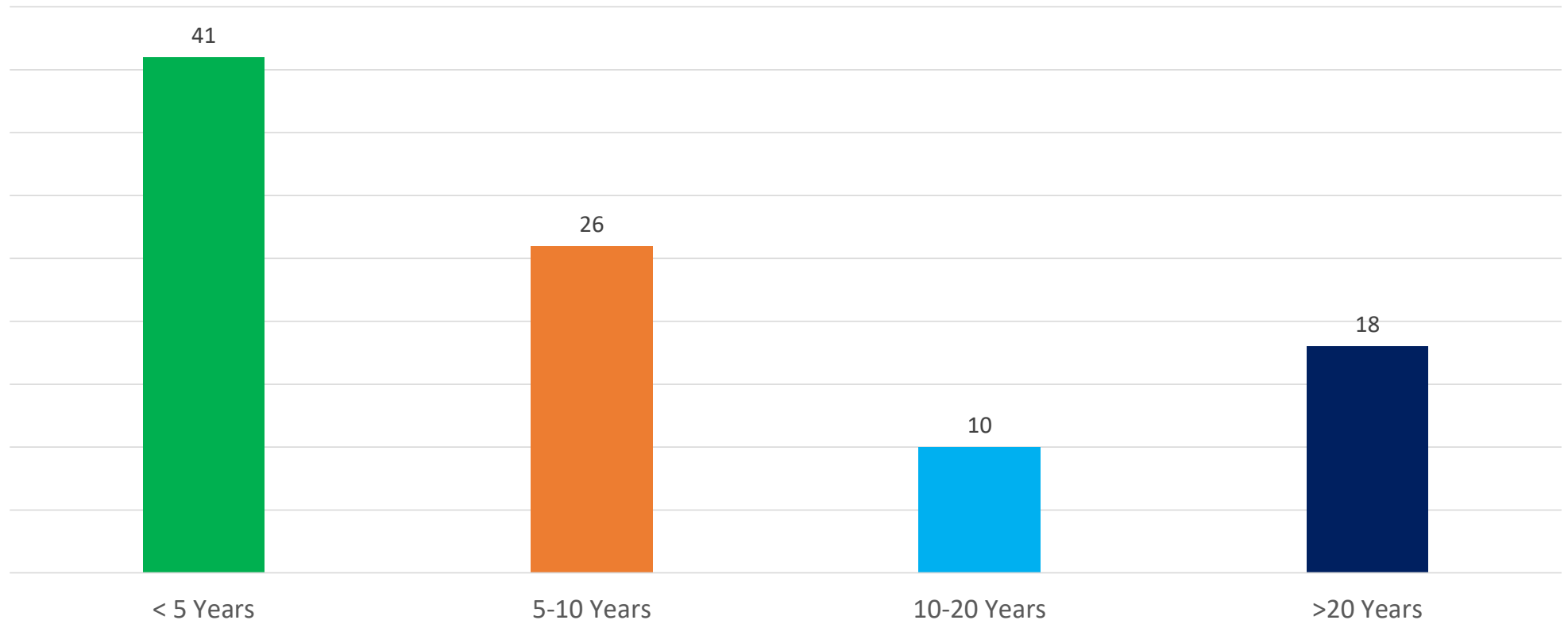
Signup



Upcoming Topics

- 3D Modeling for Digital Delivery
- Drainage
- Permitting & Environmental
- Signals/Intersections & Signing

Today's Attendance



Presentation Outline

- What is ADA?
- ADA Resources & Design Criteria
- Ramp Types
- Design Considerations
- Construction Plans
- TIFs
- Construction & Inspection (CS-4401)

What is ADA and when are ADA ramps included in a project?

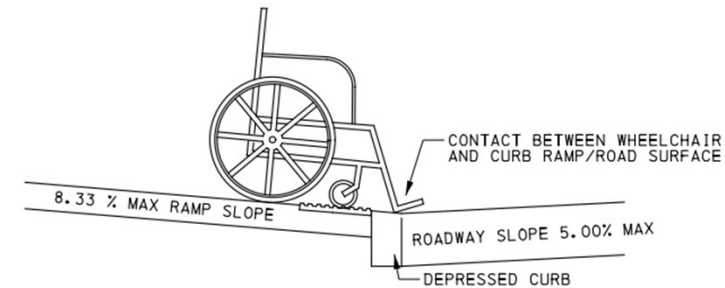
- ADA passed in 1990
- ADA required on new projects and alteration projects
- Pedestrian studies



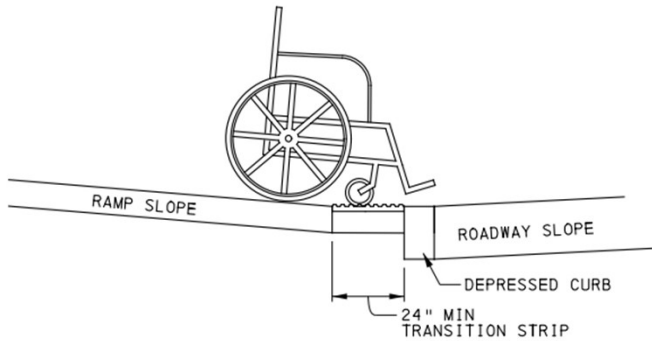
Publications

- PROWAG & ADAAG
- Publication 13M – Chapter 6 – Pedestrian Facilities
 - Requirements to upgrade curb ramps based upon project type
 - Criteria for curb ramps and sidewalk (written description of RC-67 standards)
 - Q&A Section
- Pub 72M, RC-67M
 - Standard drawings
- Publication 149 – Chapter 19 – Pedestrian Facilities at signalized intersections
- PennDOT District 6-0 ADA Design Guidance Document
 - Available on PennDOT website: www.dot.state.pa.us
(Under Design & Construction/Project Delivery)

Standard Design Criteria



ALGEBRAIC DIFFERENCES BETWEEN ROADWAY SLOPE AND CURB RAMP SLOPE GREATER THAN 13.33% NOT PERMITTED.

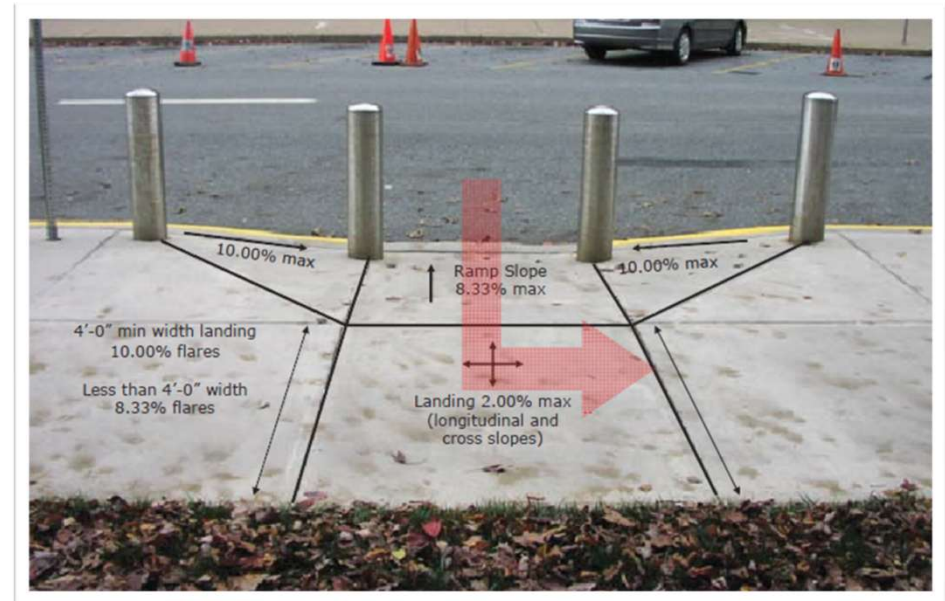


PROVIDE A 24" MIN TRANSITION STRIP IF ALGEBRAIC DIFFERENCES BETWEEN ROADWAY SLOPE AND CURB RAMP SLOPE ARE GREATER THAN 13.33%.

TRANSITION STRIP SLOPE NOT TO EXCEED 5.00%

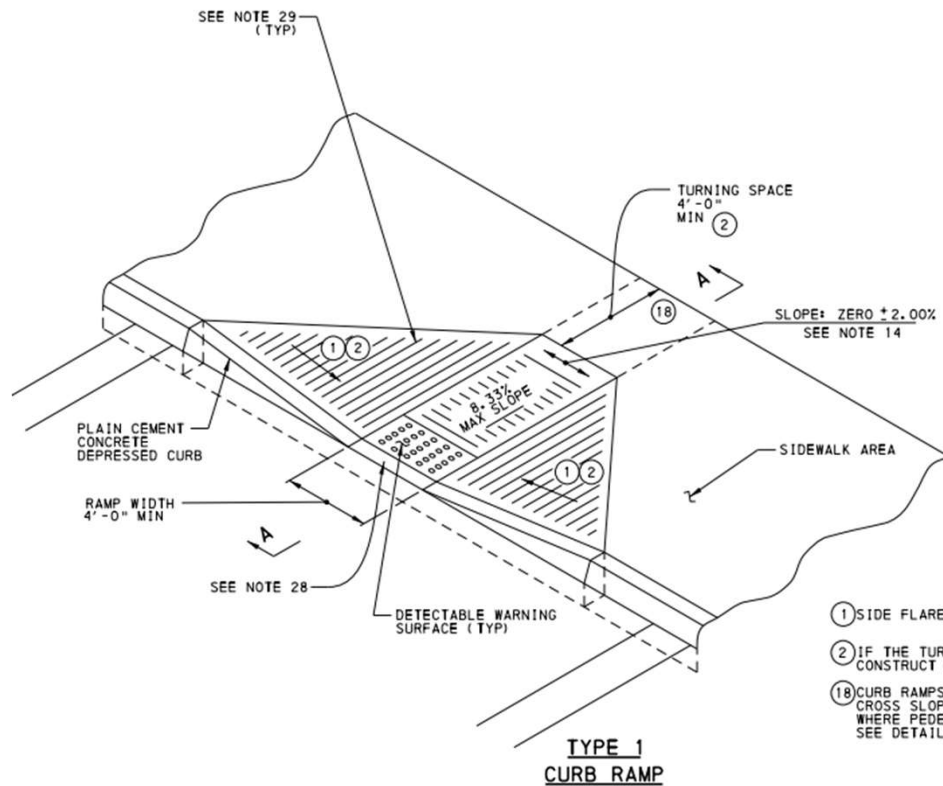
CHANGE OF GRADE LIMITATIONS

T
2
L



Ramp Types

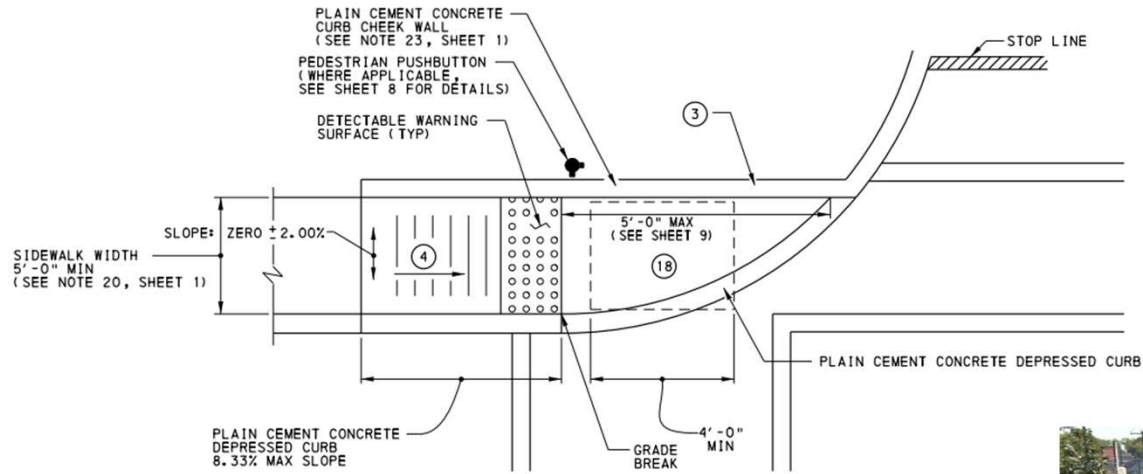
Type 1



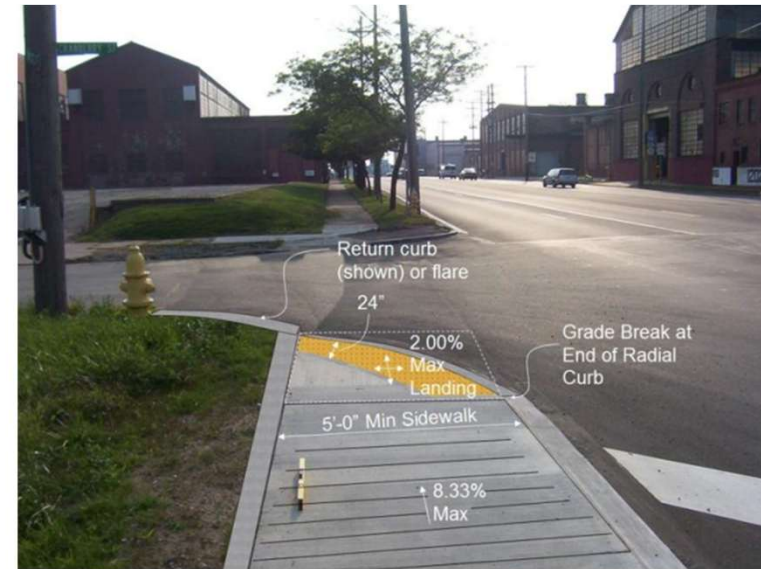
- ① SIDE FLARES 10.00% MAX SLOPE
- ② IF THE TURNING SPACE IS INDICATED TO BE LESS THAN 4'-0", CONSTRUCT SIDE FLARES 8.33% MAX SLOPE.
- ⑱ CURB RAMPS REQUIRE A TURNING SPACE WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS AND DIMENSIONS.



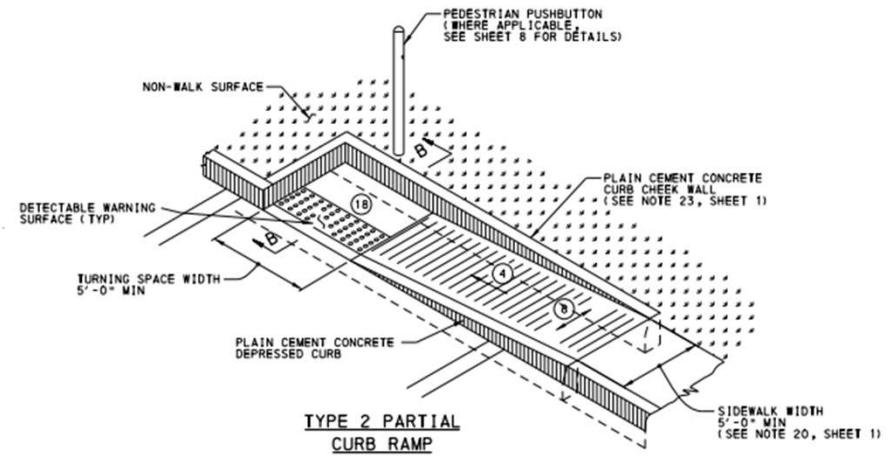
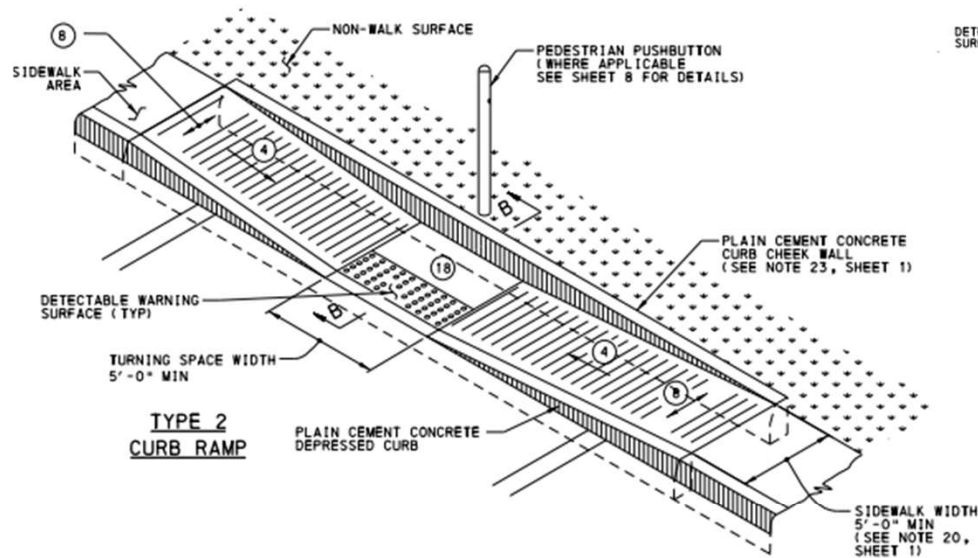
Type 1A



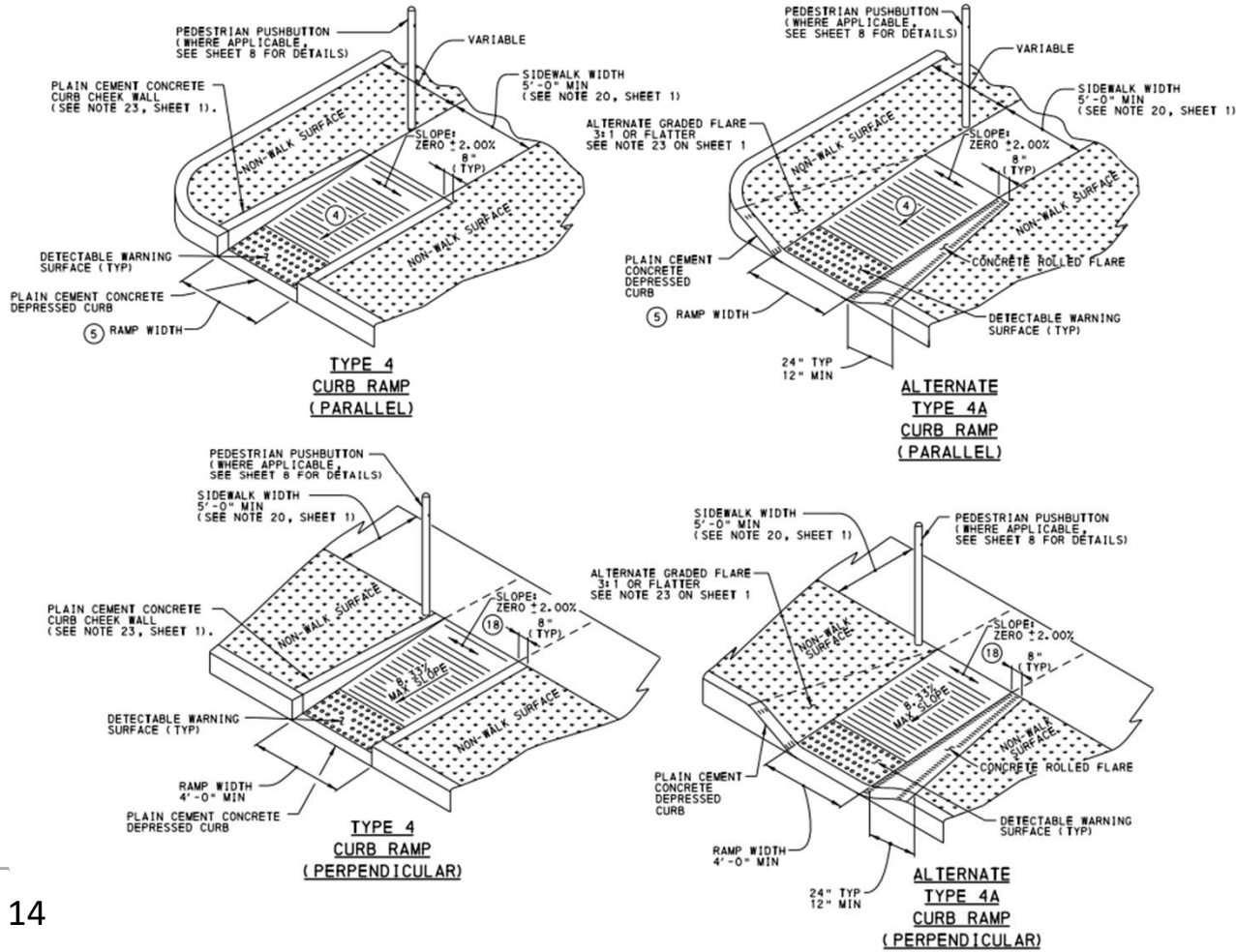
TYPE 1A
CURB RAMP
ASSISTANT DISTRICT EXECUTIVE APPROVAL
REQUIRED IF TURNING SPACE
IS NOT ENTIRELY ON SIDEWALK



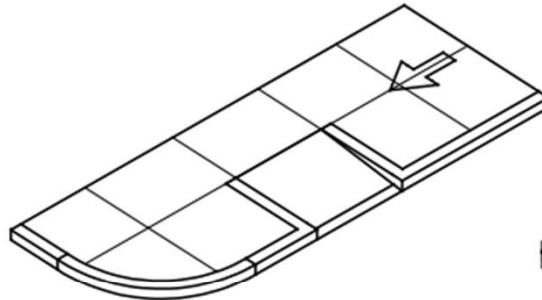
Type 2



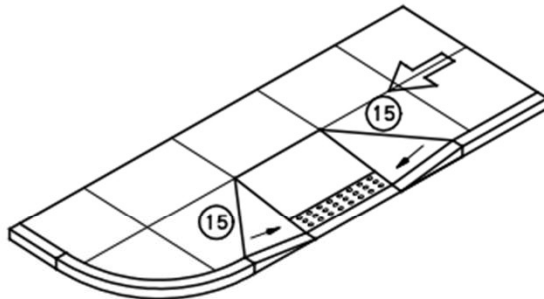
Type 4



Type 4

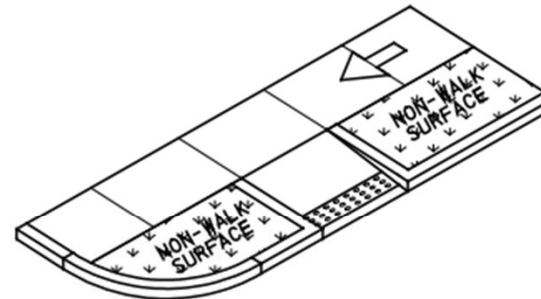


POTENTIAL PROBLEM
VERTICAL DROP



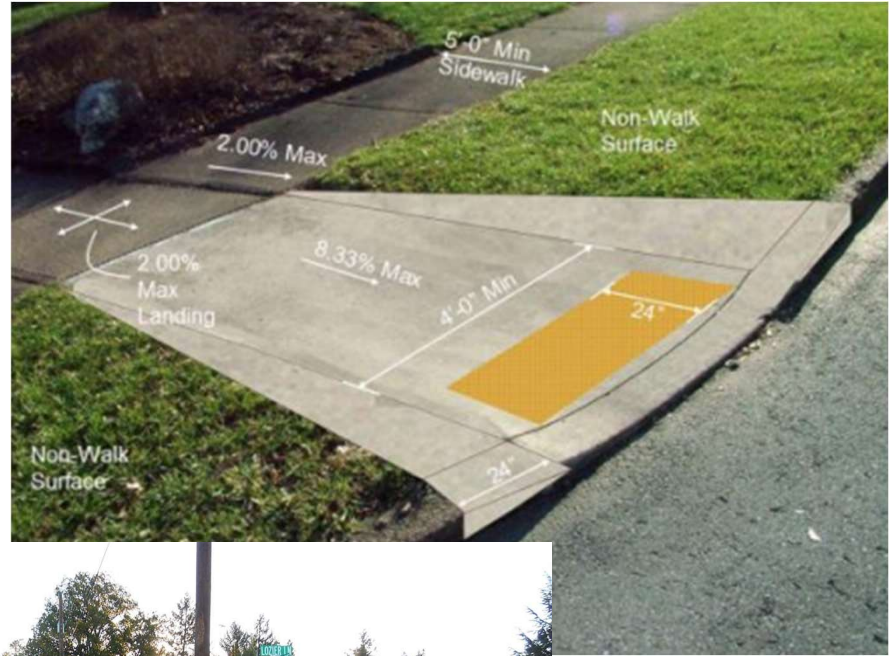
⑮ SIDE FLARES 1V:10H (10.00%) MAX FOR
RAMPS WITH LANDINGS 1220 (4'-0")
OR GREATER.
SIDE FLARES 1V:12H (8.33%) MAX FOR
RAMPS WITH LANDINGS LESS THAN 1220 (4'-0").

RECOMMENDATION

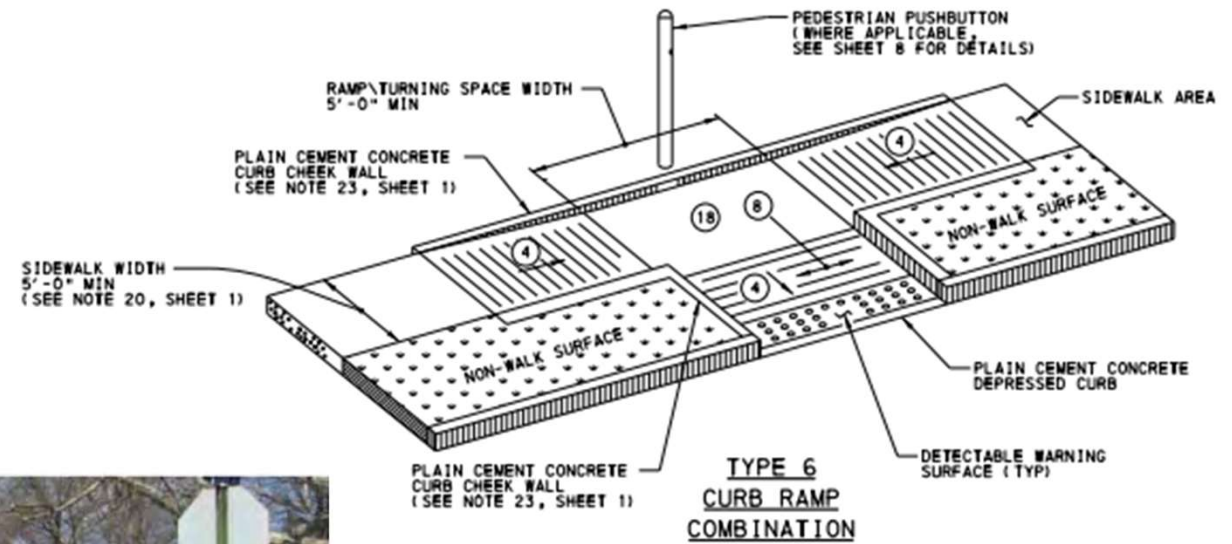


RECOMMENDATION

Bowman



Type 6



Determining Ramp Location and Type

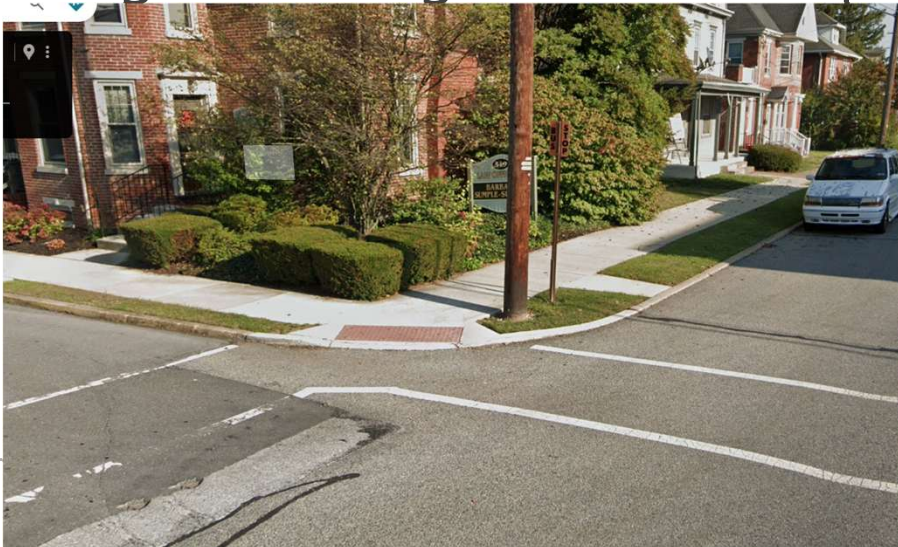
- Providing the most compliant ramp possible (trial and error)
- Accessibility to push buttons, when applicable
- Keeping location close to the intersection (within traffic signal visibility, when applicable)
- Orientation of ramp with opposing ramps and crosswalk
- Providing visibility of pedestrians by turning vehicles for safe pedestrian crossing



Other Design Considerations

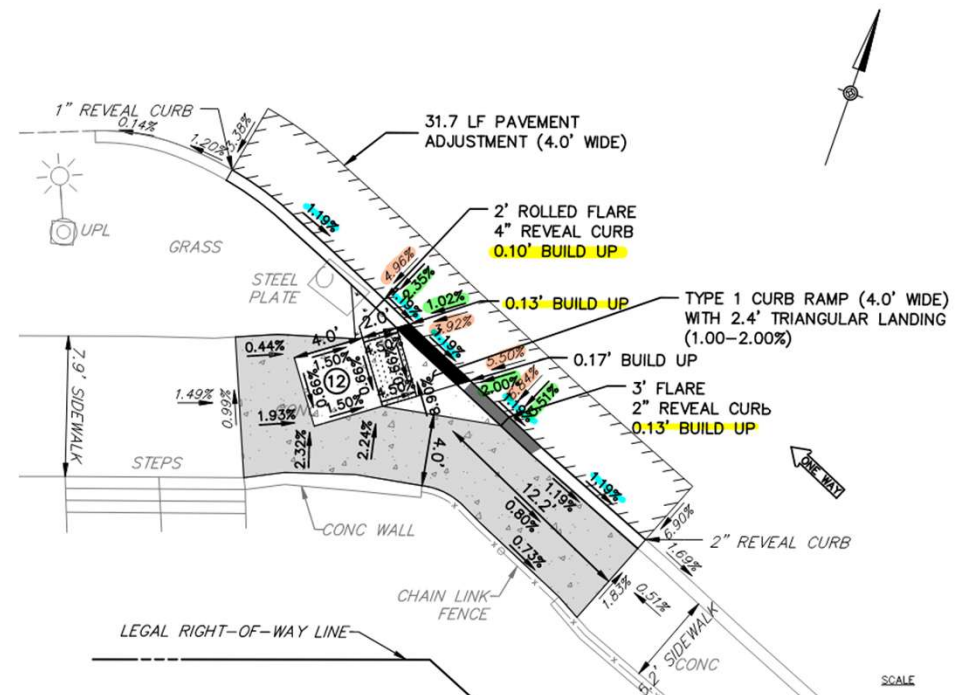
Diagonal Curb Ramps

- Require District Approval
- Do not provide directional information about crosswalk to pedestrians with visual disabilities
- Require pedestrians using wheelchairs to change direction when entering or leaving the curb ramp

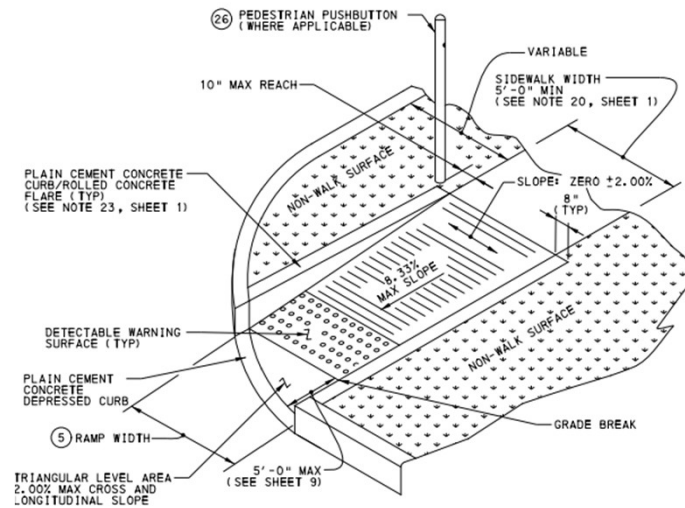


Other Design Considerations

- Mitigation of Low Points along Curbline within PAR

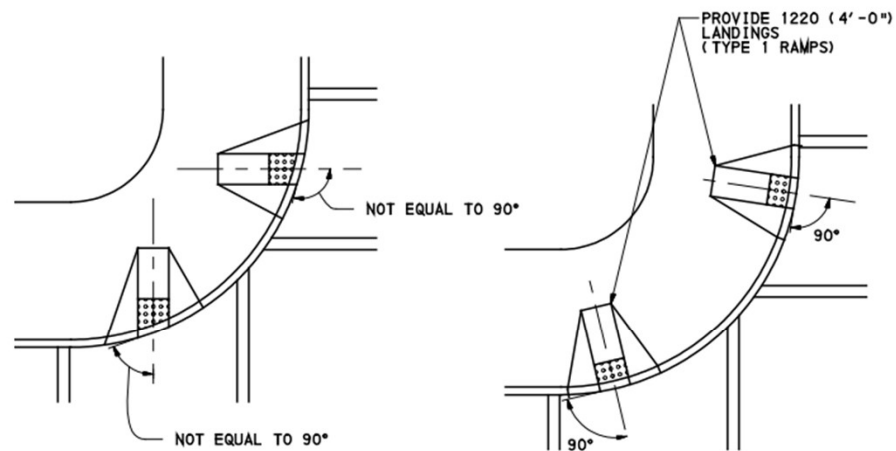


Triangular Landing



TRIANGULAR LEVEL AREA FOR DIRECTIONAL RAMP ON CURB RETURNS

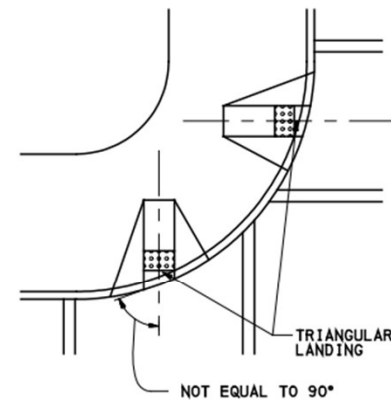
PROVIDE A LEVEL TRIANGULAR AREA WHEN DIRECTIONAL RAMP IS INSTALLED ON A CURB RETURN TO TRANSITION THE GRADE BREAK.



ON CORNERS WITH WIDE TURNING RADII, CURB RAMP THAT ARE NOT PERPENDICULAR TO THE CURB CREATE PROBLEMS FOR WHEELCHAIR USERS BECAUSE THEY REQUIRE USERS TO NEGOTIATE RAPID CHANGES IN GRADE AND CROSS SLOPE WITH TWO WHEELS LEAVING THE GROUND.

POTENTIAL PROBLEM CURB RAMP NOT PERPENDICULAR TO CURB RETURNS

RECOMMENDATION RECONSTRUCT RAMP 90° TO CURB RETURN

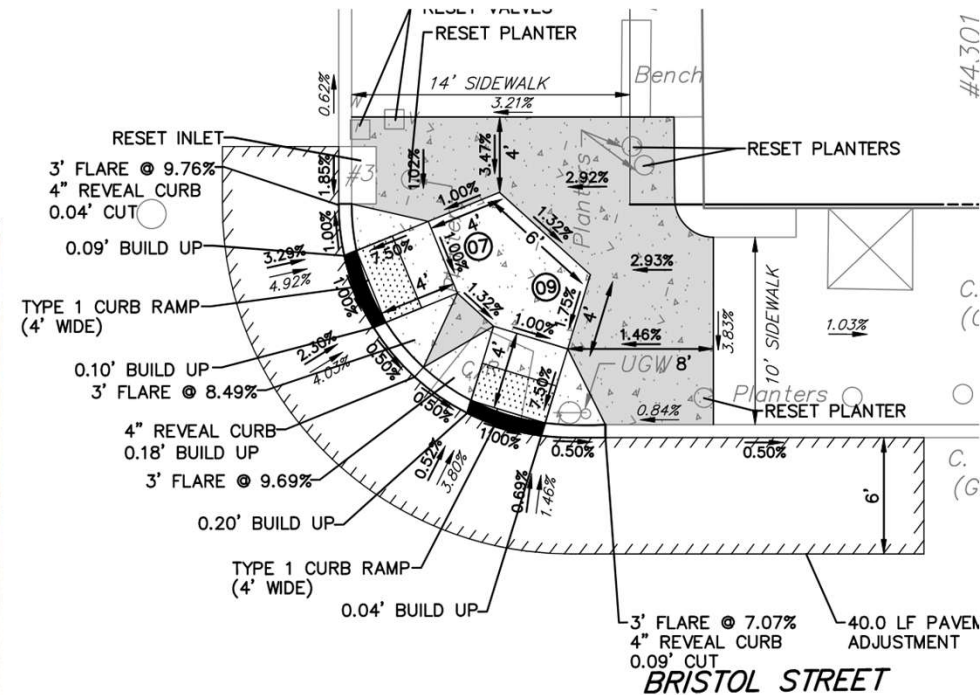


SEE RC-67M FOR DETAILS

RECOMMENDATION PROVIDE TRIANGULAR LANDINGS AT THE BOTTOM OF THE CURB RAMP

Other Design Considerations

- Curb Reveal between ramps



Other Design Considerations

- Consistent Slopes on DWS
- Cutting of DWS



Roadway Profile Transition



RAMP CROSS SLOPE TRANSITION TO MATCH ROADWAY PROFILE SLOPE

* SLOPES SHOWN ARE FOR ILLUSTRATION ONLY.

TRANSITION CURB RAMP CROSS SLOPE TO MATCH ROADWAY PROFILE AS GRADUALLY AS POSSIBLE. DO NOT EXCEED 3.00% PER 1'-0" CROSS SLOPE RATE OF CHANGE WHEN TRANSITIONING TO ROADWAY PROFILE.

COMPLETE TRANSITION TO ROADWAY PROFILE BEHIND DETECTABLE WARNING SURFACE OR USE 1'-0" DETECTABLE WARNING SURFACE TILES.

CONSTRUCT DEPRESSIBLE CURB SLOPE TO MATCH ROADWAY PROFILE.

Other Design Considerations

- Traffic Signals-Push Buttons
 - Must be reachable from a 4'x4' level landing (within 10")
- Push Button extension arms
- Pedestrian stub poles
- Foundations



Other Design Considerations

- Traffic Signals-Push Buttons
 - Must be reachable from a 4'x4' level landing (within 10")
- Push Button extension arms
- Pedestrian stub poles
- Foundations



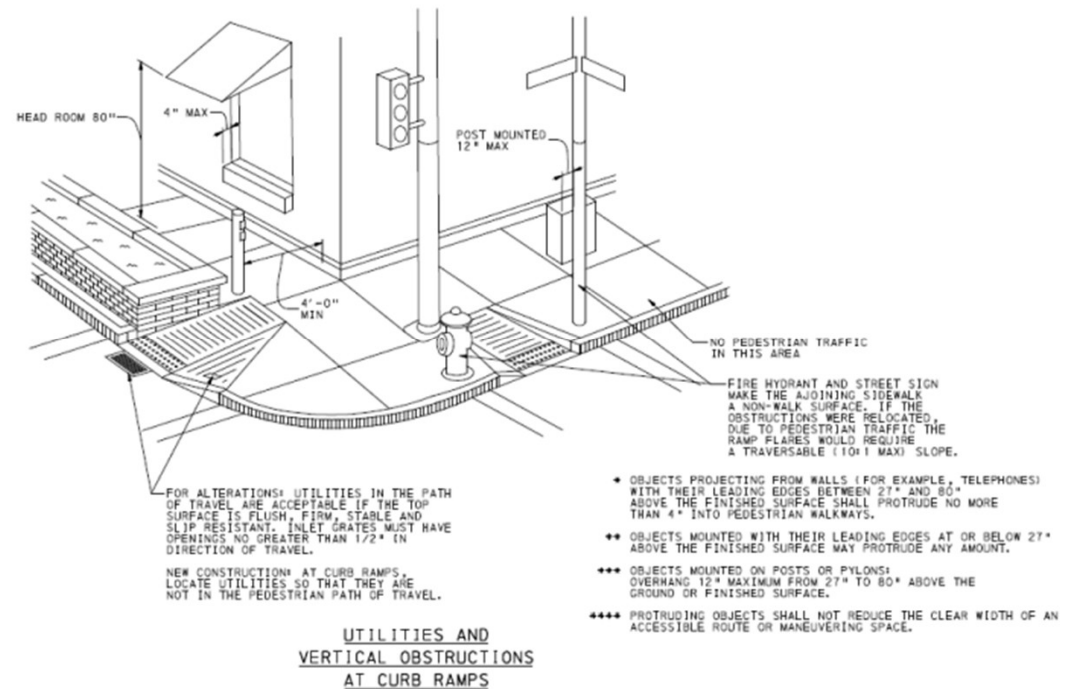
Other Design Considerations

- Traffic Signals-Push Buttons
 - Must be reachable from a 4'x4' level landing (within 10")
- Push Button extension arms
- Pedestrian stub poles
- Foundations

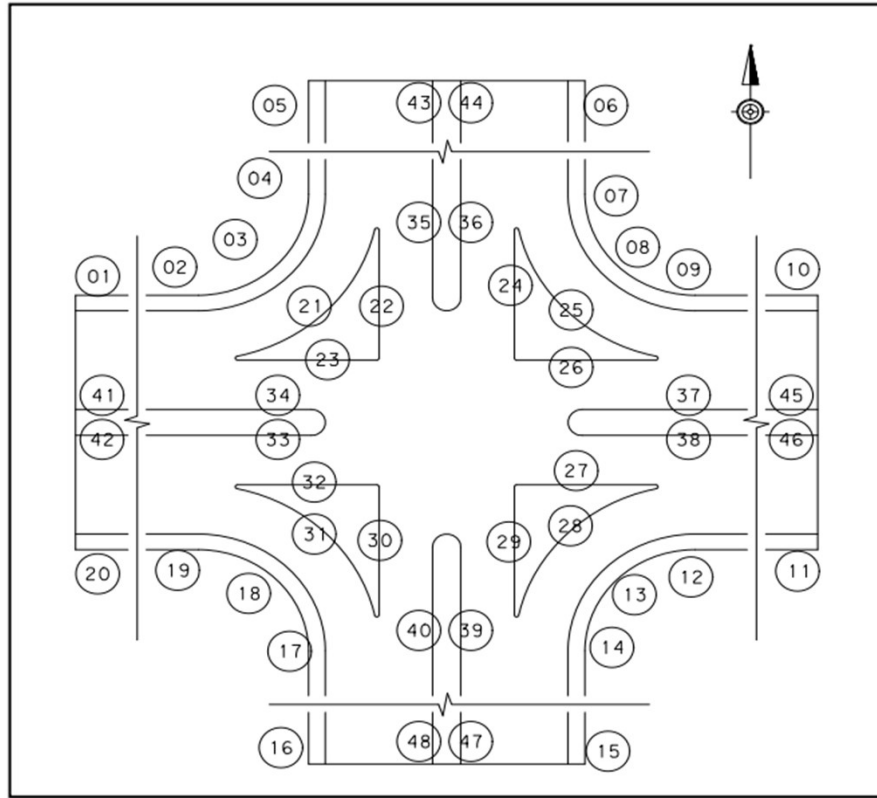


Other Design Considerations

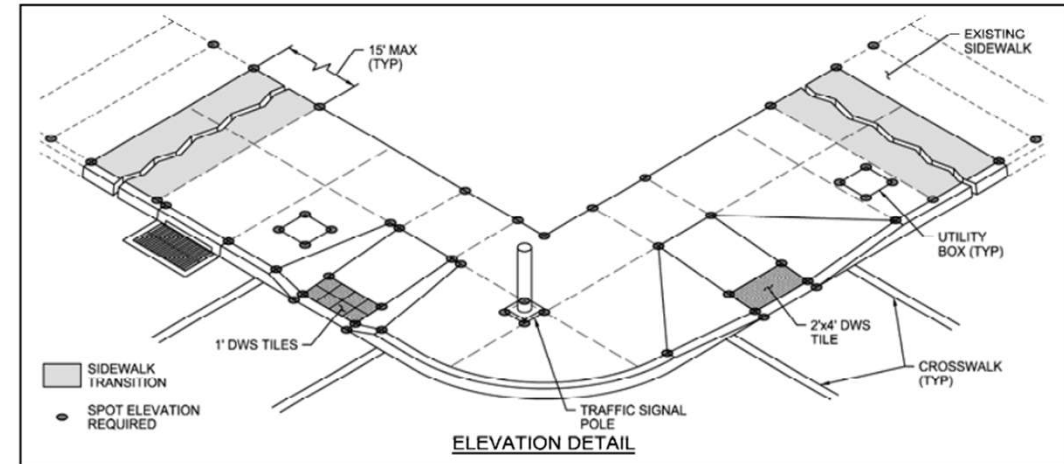
- Right-of-Way
- Utility Adjustments/Obstructions



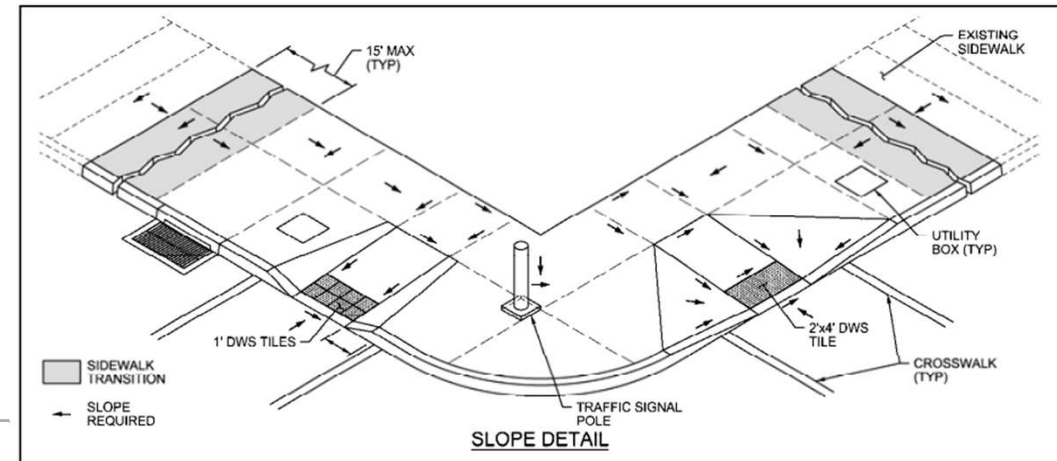
ADA Plans



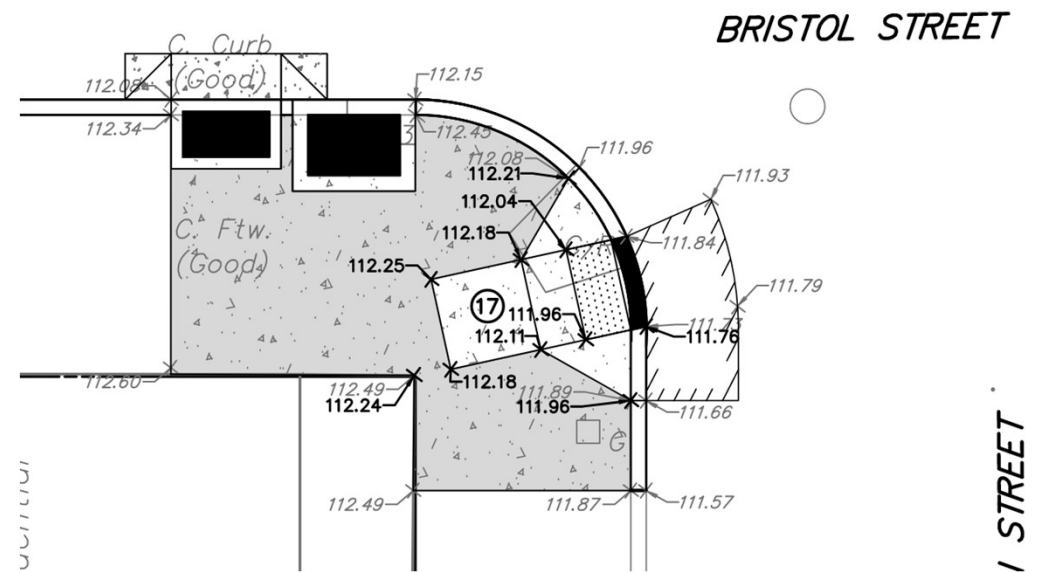
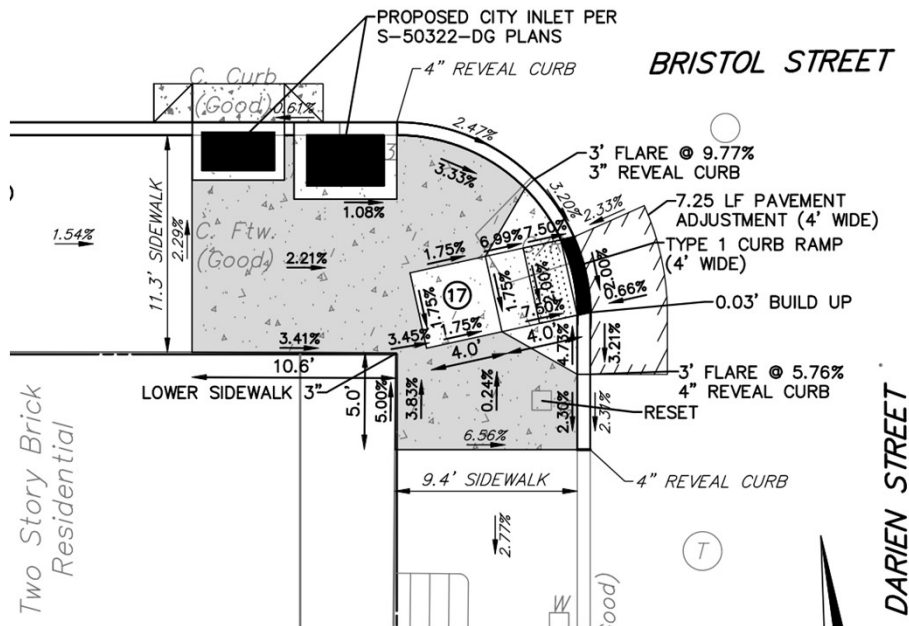
Example 1: Location of required spot elevations



Example 2: Location of required slopes



ADA Plans



Technically Infeasible Form (TIF)



Forward Completed Forms to District ADA Coordinators

ADA Technically Infeasible Form (Used to document design decisions and to be completed before construction)	
*Facility Type ☐ Curb Ramp ☐ Sidewalk ☐ Ped. Push Button ☐ Ped. Signal ☐ Other _____	Complete Section Below to ADD Location to Transition Plan *Add Location to Transition Plan ☐ Yes ☐ No Suggested Repair _____ Approx. Repair Costs _____ Actual Repair Costs _____ Actual Repair _____ Date Repaired _____
Justification for Technically Infeasible <i>(check all that apply)</i> ☐ Limited Right-of-Way ☐ Existing Utilities ☐ Structures, Buildings, Vaults ☐ Historic Areas ☐ Environmental Areas ☐ Grade Separations ☐ Other 1 _____ ☐ Other 2 _____ ☐ Other 3 _____ ☐ Other 4 _____	General Information *District: _____ *County: _____ *Township/Boro: _____ Project ECMS # _____
	Submitter Information Submitted By: _____ Submitter Company: _____ Street Address _____ City State Zip _____ Telephone _____ *Date Submitted: _____

Pr ☐ ☐ ☐ ☐ ☐ Per Per Sal R9 Exi Exi Exi AD ADA Technically Infeasible Form lorthbound 	
(Additional Explanation Sheet)	
1.) 2.) 3.)	Investigated Design Alternative #1 Investigated Design Alternative #2 Investigated Design Alternative #3 Summary
AD ☐ ☐ TII	

Technically Infeasible Form (TIF)

ADA Technically Infeasible Form
(Additional Explanation Sheet)
Investigated Design Alternative #1
Investigated Design Alternative #2
Investigated Design Alternative #3
Summary

Construction and Inspection



CS-4401 (6-17)



See the last tab of this workbook for instructions

*Date of Investigation (yyyy mm dd)				
Field Investigators 1				
Field Investigators 2				
*Engineering District Code				
*County Name				
*County Code (auto)	(Automatically Filled In)			
*Municipality Name				
*Municipality Code (auto)	(Automatically Filled In)			
Construction Phase	☐ Constructed ☐ Ex-Surveyed ☐ Missing			
Ramp Crosses	☐ State Rte ☐ Local Rd ☐ Both			
Ramp Surface	☐ Brick ☐ Concrete ☐ Other			
Surface Stable, Firm, and Slip Resistant	☐ No ☐ Yes			
Elevation Differences > 1/4"	☐ No ☐ Yes (X/16")			
Grate Openings or Gaps > 1/2"	☐ No ☐ Yes (X/16")			
Utilities in Path of Travel	☐ No ☐ Yes			
Water Ponding in Path of Travel	☐ No ☐ Yes			
Detectable Warning Surface (DWS)	☐ No ☐ Yes			
DWS type (if applicable)	☐ Mat ☐ PolConc ☐ PolCom ☐ Iron ☐ Steel ☐ Brick ☐ Other			
Pedestrian Crossing and Type	☐ No ☐ Yes ☐ N/A ☐ 1Ramp 1Crossing ☐ 1Ramp 2Crossing			
Ramp at Stop or Yield Controlled Crosswalk	☐ No ☐ Yes			
Ramp Leads to Accessible Path	☐ No ☐ Yes			
Longitudinal Slope in Front of Ramp				
Cross Slope in Front of Ramp (Road Profile)				
Turning Maneuver in Street	☐ No ☐ Yes			
Turning Maneuver at Top of Ramp (Smax)	☐ No ☐ Yes			
ECMS #	Alg Δ Grade			
Intersection Ramp # of #				
*Ramp Location (Use Figure Below)				
*Curb Ramp Type				
*North Leg		(segment)	(offset)	
*North Leg Desc.	☐ SR ☐ St ☐ Other			
*East Leg		(segment)	(offset)	
*East Leg Desc.	☐ SR ☐ St ☐ Other			
*South Leg		(segment)	(offset)	
*South Leg Desc.	☐ SR ☐ St ☐ Other			
*West Leg		(segment)	(offset)	
*West Leg Desc.	☐ SR ☐ St ☐ Other			

Construction and Inspection

TYPE 1 MAX ALG. CHANGE IN GRADE _____ % TOP TURNING AREA ☐ IF YES, MAX SLOPE "5" _____ %	TYPE 1A MAX ALG. CHANGE IN GRADE _____ %	TYPE 2 MAX ALG. CHANGE IN GRADE _____ %
TYPE 4 MAX ALG. CHANGE IN GRADE _____ % TOP TURNING AREA ☐ IF YES, MAX SLOPE "5" _____ %	TYPE 4A MAX ALG. CHANGE IN GRADE _____ % TOP TURNING AREA ☐ IF YES, MAX SLOPE "5" _____ %	TYPE 5 MAX ALG. CHANGE IN GRADE _____ % TOP TURNING AREA ☐ NO ☐ YES "CC" RAIL HEIGHT _____ INCHES
TYPE 6 MAX ALG. CHANGE IN GRADE _____ %	BLENDED TRANSITION MAX ALG. CHANGE IN GRADE _____ %	
TYPE A MEDIAN TYPE B MEDIAN 	NON-TYPICAL "A" RAMP WIDTH "B" RAMP LENGTH "C" RAMP SLOPE "D" LT FLARE SLOPE "I" RT FLARE SLOPE "J" LT SIDEWALK WIDTH "M" RT SIDEWALK WIDTH "P" SIDEWALK LANDING DEPTH "Q" LT SIDEWALK CROSS SLOPE "R" RT SIDEWALK CROSS SLOPE "S" SIDEWALK LANDING MAX SLOPE "N" RAMP MAX CROSS SLOPE MAX ALG. CHANGE IN GRADE _____ % SIDEWALK TURNING AREA ☐ IF YES, DESIGNATE MAX SLOPE "5" _____ %	
1 RAMP, 2 CROSSINGS NOTE: CROSSING MAY BE MARKED OR UNMARKED		
(insert comments below)		

"0.00" inches or %	
A	(IN)
B	(IN)
C	(%)
D	(%)
E	(%)
F	(%)
G	(%)
H	(%)
I	(%)
J	(IN)
K	(IN)
L	(IN)
M	(IN)
N	(IN)
O	(IN)
P	(IN)
Q	(%)
R	(%)
S	(%)
T	(IN)
U	(IN)
V	(%)
W	(%)
X	(IN)
Y	(IN)
YY	(IN)
Z	(IN)
ZZ	(IN)
AA	(IN)
BB	(IN)
CC	(IN)

The background features large, semi-transparent, light blue letters spelling out 'Q&A' in a bold, sans-serif font. The 'Q' is on the left, followed by an ampersand, and then the 'A' on the right. The word 'Questions?' is written in white, bold, sans-serif font, positioned in front of the 'Q' and the ampersand.

Questions?

Contact Me

Danielle.Derolf@bowman.com