ADA Training
Design Case Studies

2018
MnDOT
ADA Design Case Studies

Overview

• TH 61 (Mounds Blvd) Mill & Overlay
  – Lesson: Steep Slopes and Construction Limits
• Snelling Avenue Mill & Overlay
  – Lesson: Strategies for Commercial Constraints
• TH 43 (Mill St) Reconstruction, Rushford
  • Lesson: Strategies for Rural Retrofit
• TH 23 (Grand Ave) Mill & Overlay
  • Lesson: Strategies for Curb-Attached Sidewalks
• In-Class Design
TH 61 (Mounds Blvd)

Mill & Overlay, St. Paul

Mounds Blvd & 6th St E
Mounds Blvd & 7th St E
TH 61 (Mounds Blvd)

Mounds Blvd & 6th St E
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Mounds Blvd & 7th St E
The design called for a “tabling” of the curb to 2% to achieve the maximum gutter slope.

However, the mill & overlay project limits did not extend into 7th St…
TH 61 (Mounds Blvd)
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TH 61 (Mounds Blvd)

Summary

6th St E

- Curb Ramps installed per plan
- Construction Limits had to be extended beyond design
  - Sidewalks
  - Mill & Overlay

7th St E

- Curb Ramps originally installed per plan with curb tabled to 2% per plan
- Roadway impacts were too drastic
  - Ramps were removed and replaced at 3% grade
Snelling Ave Mill & Overlay

Mill & Overlay, St. Paul
Snelling Ave & Van Buren Ave
Snelling Ave & Minnehaha Ave
Snelling Ave Mill & Overlay

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Snelling Ave & Minnehaha Ave
90%
Vertically Constrained: steep ramps existing without landings

Limited space for push button

Snelling Ave & Minnehaha Ave: NW Quad
Notes:
1) Build 5% gutter out
2) Landing shall not exceed 6%
3) Ramp slope shall not exceed 12%

No Maintenance Access Route present

Pedestrian curb ramps will remain on transition plan due to non-compliant features!
Snelling Ave Mill & Overlay

GUTTER CONTROL POINTS

<table>
<thead>
<tr>
<th>POINT</th>
<th>X</th>
<th>Y</th>
<th>ELEVATION</th>
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<tbody>
<tr>
<td>Q1</td>
<td>555993.91</td>
<td>162742.56</td>
<td>18' RAD.</td>
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<td>Q100</td>
<td>555991.68</td>
<td>162726.88</td>
<td>926.93</td>
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<tr>
<td>Q101</td>
<td>555996.68</td>
<td>162726.86</td>
<td>927.14</td>
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<td>Q102</td>
<td>555992.68</td>
<td>162726.85</td>
<td>927.23</td>
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<tr>
<td>Q103</td>
<td>555948.83</td>
<td>162732.50</td>
<td>927.33</td>
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</table>
Snelling Ave Mill & Overlay
Vertically Constrained: steep ramps existing without landings

Limited space for push buttons

Street furniture obstructed PAR

Snelling Ave & Minnehaha Ave: SE Quad
Snelling Ave Mill & Overlay

Notes:
1) Build 5% gutter out
3) Ramp slope shall not exceed 12%
4) Landing slope shall not exceed 8%

Pedestrian curb ramps will remain on transition plan due to non-compliant features!

No Maintenance Access Route present
Snelling Ave Mill & Overlay
Snelling Ave Mill & Overlay
## Snelling Ave Mill & Overlay

<table>
<thead>
<tr>
<th>NW QUAD</th>
<th>Without Bumpout</th>
<th>With Bumpout</th>
<th>Difference in Quantities</th>
<th>Unit Cost</th>
<th>Difference in Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove C&amp;G (LF)</td>
<td>32 LF</td>
<td>52 LF</td>
<td>20 LF</td>
<td>$5.50</td>
<td>$110.00</td>
<td>$13,423.00</td>
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<tr>
<td>Remove Pavement (SY)</td>
<td>0 SY</td>
<td>48 SY</td>
<td>48 SY</td>
<td>$8.00</td>
<td>$384.00</td>
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</tr>
<tr>
<td>Sawcut Full Depth Pavement (LF)</td>
<td>0 LF</td>
<td>78 LF</td>
<td>78 LF</td>
<td>$4.00</td>
<td>$312.00</td>
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<tr>
<td>Place C&amp;G (ADA) (LF)</td>
<td>32 LF</td>
<td>74 LF</td>
<td>42 LF</td>
<td>$28.00</td>
<td>$1,176.00</td>
<td></td>
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<tr>
<td>Mill &amp; Patch Bit. (LF)</td>
<td>32 LF</td>
<td>0 LF</td>
<td>-32 LF</td>
<td>$25.00</td>
<td>$(800.00)</td>
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</tr>
<tr>
<td>Relocate Drainage Structure (EA)</td>
<td>0 EA</td>
<td>2 EA</td>
<td>2 EA</td>
<td>$5,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>Truncated Domes (SF)</td>
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<td>24 SF</td>
<td>-12 SF</td>
<td>$47.00</td>
<td>$(564.00)</td>
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<tr>
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<td>505 SF</td>
<td>255 SF</td>
<td>$11.00</td>
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<table>
<thead>
<tr>
<th>SE QUAD</th>
<th>Without Bumpout</th>
<th>With Bumpout</th>
<th>Difference in Quantities</th>
<th>Unit Cost</th>
<th>Difference in Cost</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
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<td>47 LF</td>
<td>9 LF</td>
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<tr>
<td>Remove Pavement (SY)</td>
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<td>49 SY</td>
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<tr>
<td>Sawcut Full Depth Pavement (LF)</td>
<td>0 LF</td>
<td>71 LF</td>
<td>71 LF</td>
<td>$4.00</td>
<td>$284.00</td>
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<tr>
<td>Place C&amp;G (ADA) (LF)</td>
<td>38 LF</td>
<td>67 LF</td>
<td>29 LF</td>
<td>$28.00</td>
<td>$812.00</td>
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</tr>
<tr>
<td>Mill &amp; Patch Bit. (LF)</td>
<td>38 LF</td>
<td>0 LF</td>
<td>-38 LF</td>
<td>$25.00</td>
<td>$(950.00)</td>
<td></td>
</tr>
<tr>
<td>Relocate Drainage Structure (EA)</td>
<td>0 EA</td>
<td>0 EA</td>
<td>0 EA</td>
<td>$5,000.00</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Truncated Domes (SF)</td>
<td>36 SF</td>
<td>24 SF</td>
<td>-12 SF</td>
<td>$47.00</td>
<td>$(564.00)</td>
<td></td>
</tr>
<tr>
<td>6&quot; Concrete Sidewalk (SF)</td>
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<td>850 SF</td>
<td>465 SF</td>
<td>$11.00</td>
<td>$5,115.00</td>
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\[ \Delta \text{COST} = \$18,561.50 \]

\[(\text{DRAINAGE} = \$10,000.00)\]

**Additional cost to remove these ramps from the transition plan**
Summary

Mill & Overlay projects are “alterations”

- Curb Ramps SHALL be installed/upgraded as part of the alteration (if not compliant with the standards in place at time of construction)
- Project Scope should include pay items that are necessary for ADA-compliant curb ramps

Commercial/Urban corridors provide unique challenges

- Locate and consolidate street furniture to preserve PAR width and easy navigation for all users
- Designers should consider curb bumpouts or boulevards to create room for pedestrians, APS, and ADA-compliant curb ramps

➢ Bumpouts were installed to achieve acceptable curb ramp slopes and combined directional (preferred) ramps
TH 43 (Mill St) Reconstruction

Reconstruction
Mill St Through Rushford
TH 43 (Mill St) Reconstruction
TH 43 (Mill St) Reconstruction
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TH 43 (Mill St) Reconstruction

Summary

Residential retrofitting of walkways has a variety of challenges

• Residential and commercial areas linked by sidewalks
• When present, boulevards allow for easier retrofitting
• Fences, stairs, vegetation, etc. may be barriers to accessibility
• Reconstruction (vs. mill & overlay) provides flexibility in achieving accessible walkways despite steep slopes

Mill St. Reconstruction

• Sidewalks widened throughout the corridor
• Curb ramps updated to be ADA-compliant
• Roadway and gutter slopes flattened at pedestrian crossings
• Detailed design (Level 3) necessary for curb ramps
TH 23 (Grand Ave) Mill & Overlay

Mill & Overlay, Duluth
Grand Ave, 83rd St to I-35
TH 23 (Grand Ave) Mill & Overlay
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NOTE:
1. Pedestrian ramps and landings should be built to the elevations and slopes depicted in this plan.
2. The tie-in to existing walks and steps may be substandard. Ties-ins to be constructed as directed by the engineer.
3. Sidewalk transitions need to be constructed with 60° tapers.
4. A 5’ x 8’ bus pad needs to be constructed at each bus stop.

DENOTES 6” CONCRETE WALK
MATCH EXISTING BOTTOM OF STEP ELEVATION,
CONSTRUCT 8’ x 8’ BUS STOP PLATFORM.

LEGEND

CONTROL POINTS AT GUTTER FLOW LINE
TRUNCATED DOMES (SEE STANDARD PLATE T900)
CURB HEIGHT
LANDING AREA - 4’ x 4’ MIN DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.25% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 3.5% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
DRAINAGE FLOW ARROW

ADA DETAILS - CONSTRUCTION DETAILS

STATE PROJ. NO. 6910-89 (TH 23) SHEET NO. 79 OF 319 SHEETS

SHEET 79
TH 23 (Grand Ave) Mill & Overlay
TH 23 (Grand Ave) Mill & Overlay
TH 23 (Grand Ave) Mill & Overlay
TH 23 (Grand Ave) Mill & Overlay
Summary

Narrow boulevards (or no boulevards) and large curb radii restrict ADA design options and make design and construction more technical/difficult.

- Curb Ramps at intersections are designed as depressed corners or fan ramps
  - Combined Directional ramps are preferred
- Driveways are designed as either offset or parallel
  - Perpendicular driveways are preferred
  - Pedestrians must navigate many longitudinal slopes
- Pedestrians on sidewalks compete with signs, push buttons, street furniture, etc.
  - Boulevards provide space for obstacles and a buffer from traffic
TH 23 (Grand Ave) Mill & Overlay

Summary

Grand Ave Mill & Overlay ADA improvements

- New segments of sidewalk create connections on both sides of TH 23
- Landings provided at stairs, doorways, etc.
- APS installation and enhancement
- Curb ramps installed at new locations and updated at existing locations to be ADA-compliant
- Existing narrow sidewalks and narrow boulevards replaced with widened sidewalks
- Street access closures reduce crossings
- Bus pullouts and adequate loading space provided at bus stops
Questions?