Design and Construction Surveying for ADA Projects

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Key Messages

- We need total station accuracy for design surveys.

- Different levels of survey detail necessitated by intersection complexity.

- Why should we stake the flow line rather than back of curb for curb ramps?

- Coming soon: Sidewalk profiles in your plans.
### ADA Survey Accuracy: \( \frac{1}{4}'' \)

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Inherent Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Station</td>
<td>0.02</td>
</tr>
<tr>
<td>LIDAR</td>
<td>0.08</td>
</tr>
<tr>
<td>VRS</td>
<td>0.10</td>
</tr>
<tr>
<td>Mapping</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*Total station equipment is the only acceptable survey method.*

A 6 ft length ramp designed at 7.5% could very well be non-compliant using LIDAR, VRS, or mapping.
# Levels of Detail

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
</table>
| • Curb ramps line up with in-place sidewalks  
• Contractor builds according to standard plans with a tabulation  
• Surveys not required | • When ramp layouts differ from standard plans and for all signalized intersections  
• 20-scale detail provided in plan  
• Ramp slope ranges and working points provided | • When slopes are non-compliant or there’s a tie-in point (such as a doorway)  
• 20-scale detail provided in plan  
• Specific ramp slopes and working points provided |
Level 1 (Standard Plan) Ramps
Level 2 Ramps
Level 3 Ramps
20–Scale Detail: Doorways

MATCH WALK AT EXISTING ELEVATION

MATCH WALK TO BOTTOM OF EXISTING STEP

MATCH WALK AT EXISTING ELEVATION

80.17 (621)

0.6%

80.67 (624)

1.8%

81.11 (627)

1.7%
ADA Topos: Vicinity
ADA Topos: Utilities

- Use methods such as multiple shot or single shot w/diameter when locating the center of signal poles, light bases and similar structures with obstructions. Always shoot the center of unobstructed structures such as hand holes and the corners on structures such as cabinets, cabinet bases and vaults.

- Accuracy is key!
ADA Topos: Signal Bases

- Additional signal base shots needed to determine if push button can be installed on the signal pole
ADA Topos: Doorways

- Tie-in elevations at entrance
- Height and tread width of bottom step
Matching Stoops/Doorways
Matching Steps Example
ADA Topos: Curb Line Changes
Importance of Accurate Road Topos
Importance of Accurate Road Topos
Discussion: How long would a typical intersection take?
20–Scale Detail: Working Points

### SIGNAL CONTROL POINTS

<table>
<thead>
<tr>
<th>POINT NO.</th>
<th>X</th>
<th>Y</th>
<th>DISTANCE TO FRONT OF LANDING (FT)</th>
<th>DISTANCE TO BACK OF LANDING (FT)</th>
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<tbody>
<tr>
<td>PB8-1</td>
<td>555973.5471</td>
<td>186473.9606</td>
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<td>PB2-2</td>
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<td>186470.6450</td>
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<td>PB4-2</td>
<td>ON POLE 3</td>
<td>ON POLE 3</td>
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<td>2</td>
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<td>7.5</td>
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<td>186457.9452</td>
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<tr>
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<td>ON POLE 6</td>
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<tr>
<td>POLE 6</td>
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<td>253778.9766</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Construction Staking: Working Points

08/11/2011
Construction Staking: Back of Curb
Construction Staking: Flow Line
Construction Staking: Back of Curb
Construction Staking: Flow Line
Construction Staking: PAR

13%

1.7%
Construction Staking: PAR

2.0% Max
Sidewalk Profiles

MATCH WALK AT EXISTING ELEVATION
MATCH WALK TO BOTTOM OF EXISTING STEP
MATCH WALK AT EXISTING ELEVATION

80.17 (621)
80.67 (624)
81.11 (627)

0.6%
1.8%
1.7%

80.12 (622)
80.52 (625)
80.96 (628)

2%

79.76 (623)
80.14 (626)
80.61 (629)

WALK 1 PROFILE

LAKES TECHNOLOGY GROUP

+65.60
1,381.30

VPI
STEVELLY'S EL.

+0.92%
Entrance Tie-ins