# Surveyor's Workshop

Todd Grugel – ADA Program Engineer

March 22, 2012

# 3 Levels of Curb Ramp Detail

- Non-Signalized Curb Ramp Reconstruction
  - Typically utilizing standard plans and identifying ramp types at each quadrant
- Signalized Curb Ramp Reconstruction with upgrades to APS or "APS ready"
  - Custom Designs
  - Identifying Crosswalk Locations
  - Grades determined in the field
- Vertically Constrained Areas
  - Matching Doorways
  - Curb Line Changes

# Survey Needs and Design Survey Practices

- Designer will determine which locations need field surveys from site field-walk
- Topographic field surveys will be needed in areas that require custom designs and/or signalized intersections
- Need survey-grade precision when locating all features including utilities, no handheld GPS
- Use line-distance offset as necessary to locate the center of features such as signal poles or take shots on either side of the foundation

# Level 1 - Curb Ramp Reconstruction



MINNESOTA DEPARTMENT OF TRANSPORTATION

# Level 2 - Signalized Intersection

- Curb line, Sidewalk edges, Hydrant, Gate Valve, Signal Pole, Power Pole, Ped PB station, Fence, Bench, Signs, Handhole, Crosswalk Striping

# Surveyed Intersections

- Site may contain numerous features
- Surveys should locate:

  - All utilities including handholes, manholes, hydrants, gate valves, drainage structures, signal poles/cabinets, light poles, loop detectors, telephone/cable boxes, fiber optic vaults, and irrigation/sprinkler heads or services

  - Buildings and doorways, other permanent features in sidewalk areas such as landscaping, retaining walls, benches, sign posts, etc.,

  - Crosswalk striping, curb and gutter, sidewalk edges 30' in both directions(mainline and side street), Median locations

  - ROW in areas where the construction limits may fall close to or outside existing ROW

# Level 3 - Vertical Constraints

- Curb line, Sidewalk edges, Hydrant, Signal Pole, Signal Cabinet, Handhole, Crosswalk Striping
- Elevation of alcove concrete slab in front of door is critical

# Curb Line Changes

# Matching into Roadway Surface

# Gutter flow line slope through ramps

- If the gutter flow line profile exceeds 2% in front of the ramps, the cross slope of the ramp will exceed 2% until it can be warped to a flatter cross slope.

# Gutter flow line slope

- Gutter line and ramps should drain properly, to not hold water

# Commercial Sidewalk Reconstruction

# Maintaining PAR through driveways

# Matching in place Doorways

# Making up cross slope elevation

# Can’t Match All Doorways

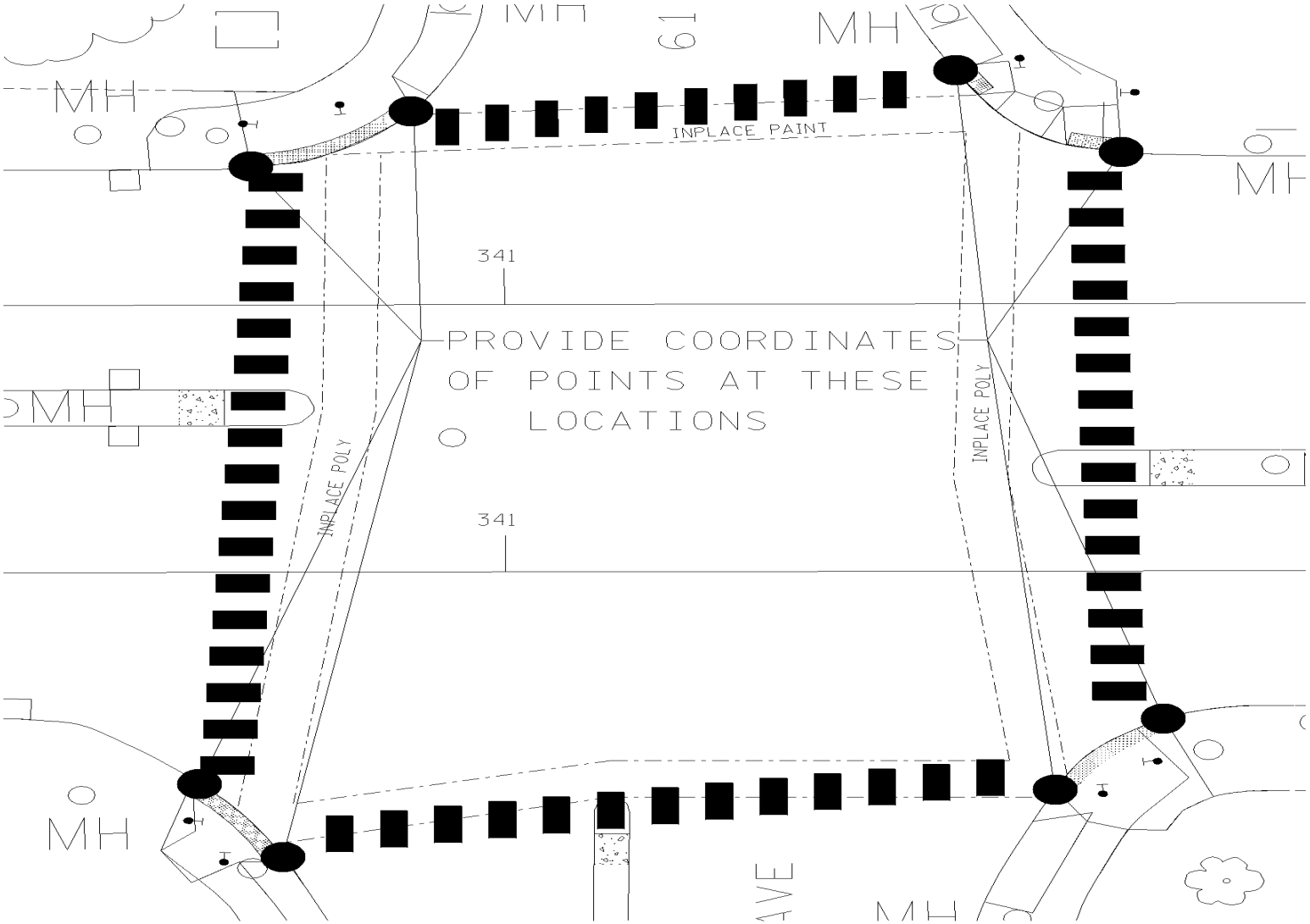
# Maintaining Cross & Running Slopes

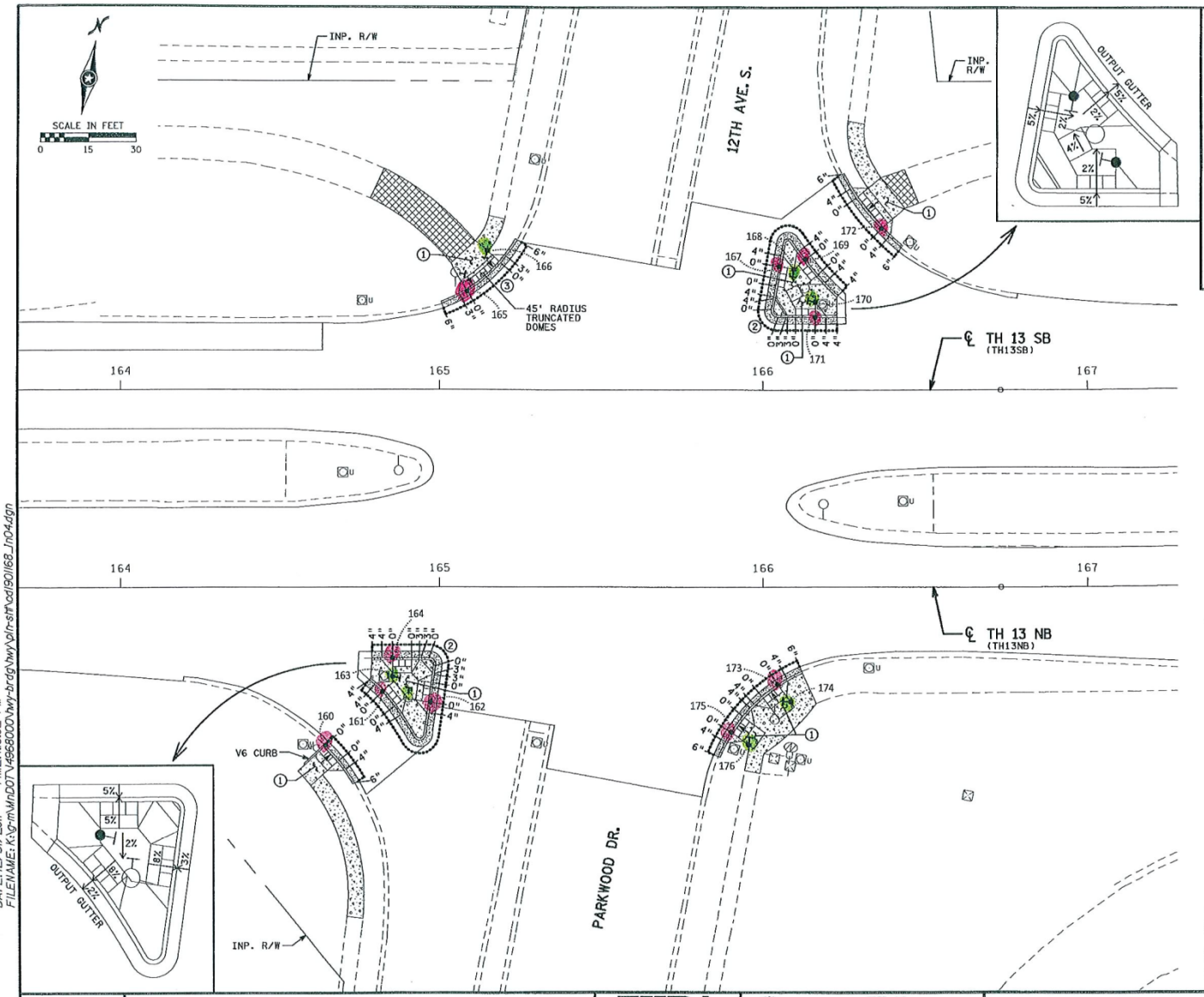
# Maintaining Cross & Running Slopes

# Construction Survey Needs

- Stake "working points" – provide offset and line reference stakes
- Stake Signal poles and pedestrian push button stations
- Not time-consuming work, most jobs will probably require few site visits
- Contractor is responsible for constructing acceptable grades
- Some plans may require surveyor to stake gutter flowline elevations
- Some large-scale construction projects may require more elevation staking

# Locating APS Pushbuttons


MH
MH
MH
MH
INPLACE PAINT
341
PROVIDE COORDINATES
OF POINTS AT THESE
LOCATIONS
341
INPLACE POLY
INPLACE POLY




## LEGEND

- INPLACE ROADWAY, WALK, OR TRAIL
- SAWCUT
- PEDESTRIAN CURB RAMP (SEE SHEETS -- THRU -- AND STANDARD PLATE 7036)
- PEDESTRIAN PUSH BUTTON STATION
- INPLACE SIGNAL POLE
- INPLACE HANDHOLE
- X" CURB HEIGHT AT INDICATED LOCATION
- XXX INTERSECTION POINT OF CROSSWALK / PEDESTRIAN RAMP EDGE AT FACE OF CURB OR EDGE OF PAVEMENT
- TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- CONCRETE CURB & GUTTER
- 6" CONCRETE WALK
- 3" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB340B) ON 6" AGGREGATE BASE CLASS 6
- INDICATES 4' LONG PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 0.020 FT/FT MINIMUM AND 0.083 FT/FT MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 0.020 FT/FT

## STAKING POINTS

| POINT | POINT TYPE | X | Y | ELEV. |
|---|---|---|---|---|
| 160 | FACE OF CURB | 515105.41 | 213586.01 | --- |
| 161 | FACE OF CURB | 515119.60 | 213605.38 | 934.39 |
| 162 | FACE OF CURB | 515135.05 | 213604.84 | 934.38 |
| 163 | PUSH BUTTON | 515121.95 | 213610.52 | --- |
| 164 | FACE OF CURB | 515120.92 | 213616.09 | 934.54 |
| 165 | FACE OF CURB | 515123.42 | 213730.40 | --- |
| 166 | PUSH BUTTON | 515127.13 | 213743.70 | --- |
| 167 | FACE OF CURB | 515216.96 | 213755.50 | 933.24 |
| 168 | PUSH BUTTON | 515221.64 | 213755.54 | --- |
| 169 | FACE OF CURB | 515224.58 | 213759.08 | 933.08 |
| 170 | PUSH BUTTON | 515229.88 | 213746.80 | --- |
| 171 | FACE OF CURB | 515230.70 | 213742.20 | 933.51 |
| 172 | FACE OF CURB | 515245.85 | 213772.50 | --- |
| 173 | FACE OF CURB | 515239.54 | 213629.85 | --- |
| 174 | PUSH BUTTON | 515244.46 | 213625.35 | --- |
| 175 | FACE OF CURB | 515228.07 | 213612.88 | --- |
| 176 | PUSH BUTTON | 515234.08 | 213610.00 | --- |

ELEVATIONS GIVEN AT FACE OF CURB FOR PORK CHOP ISLANDS.

### GENERAL NOTES:

- MAINTAIN A MINIMUM 4' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO EDGE OF WALK.
- THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT.
- PROVIDE A SAWCUT (INCIDENTAL) AT ALL CONCRETE WALK AND BITUMINOUS TRAIL REMOVAL LIMITS.
- ALL CURB RAMPS AND LANDING AREAS SHALL BE 6" CONCRETE WALK ON 3" AGGREGATE BASE CLASS 6. ALL EXCAVATION, SUBGRADE PREPARATION, AGGREGATE BASE, COMMON BORROW, AND TOPSOIL BORROW SHALL BE INCIDENTAL.
- LANDINGS SHALL BE CONNECTED TO EXISTING SIDEWALKS MAINTAINING A 4' WIDE (MINIMUM) PEDESTRIAN ACCESS ROUTE WITH CROSS SLOPE THAT DOES NOT EXCEED 0.020 FT/FT AND A RUNNING SLOPE THAT DOES NOT EXCEED 0.050 FT/FT.
- ALL DISTURBED AREAS IN A CUT SECTION THAT ARE NOT OTHERWISE RESURFACED SHALL BE GRADED FLUSH WITH NEW SURFACING AT A 1:6 SLOPE FOR A DISTANCE OF UP TO 5 FEET FROM THE EDGE OF WALK TO MATCH SURROUNDING CONTOURS.
- IF AN INPLACE UTILITY DOES NOT ALLOW A PUSH BUTTON STATION TO BE PLACED AT THE LOCATION INDICATED IN THE PLAN, THEN THE CONTRACTOR SHALL CONSULT WITH Mn/DOT PERSONNEL TO DETERMINE A SOLUTION.

### SPECIFIC NOTES:

1. MINIMUM 4'x4' PEDESTRIAN LANDING AREA AT A MAXIMUM SLOPE OF 0.020 FT/FT.
2. CONCRETE APPROACH NOSE. SEE STANDARD PLATE 7113.
3. 3' LONG PEDESTRIAN RAMP.

DATE: 12/31/2011 TIME: 1:19:02 PM
FILENAME: K:\grnMnDOT\49680000\hwy-brdg\hwy\pln-sht\od1901168_In04.dgn

DRAWN BY: SFH
CHECKED BY: SJS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
SIGNATURE:
PRINTED NAME:
DATE: LIC. NO.

TKDA ENGINEERING • ARCHITECTURE • PLANNING

TH 13 BETTER ROADS PRESERVATION PROJECT

INTERSECTION DETAILS
TH 13 AT 12TH AVE. S./PARKWOOD DR.

4 OF 32

STATE PROJ. NO. 1901-168 (TH 13)
Sheet No. 29 of Sheets

# Construction Stake “Working Points“

# Construction Stake – Provide Offset

# Contractor is Responsible for Grades

# Curb Line Changes

# Questions?