

Streamlined Curb Ramp Replacements for Pavement Rehabilitation Projects

Gabe Crop, PE | Murray, Smith & Associates, Inc.

MSA



Presentation Outline

- The ADA problem
- Design approach options
- Streamlined approach
- Mix in some case studies
- Before and after photos

Background “technical stuff”

- 1990 Title II of the Americans with Disabilities Act (ADAAG)
- 2010 Regulations Update
- 2011 PROWAG
- 2013 Joint DOJ/DOT Guidance and FAQ for “Alterations”
- <http://www.ada.gov/ta-pubs-pg2.htm>

ODOT suit for ADA Compliance

- Detailed Design Requirements
- Design Exceptions
- Construction
 - Field Verification
 - Working Drawings
 - Pre-Placement Meeting
 - ADA Inspection Form
- Permits
- An evolving process...

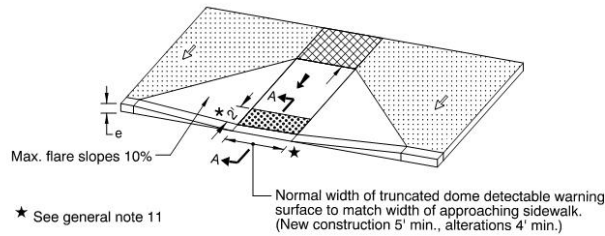
Effect of including curb ramps with resurfacing projects

- 10% to 30% increase in construction cost
- Additional:
 - design effort
 - concrete and general contractors
 - inspection/CM
 - headaches

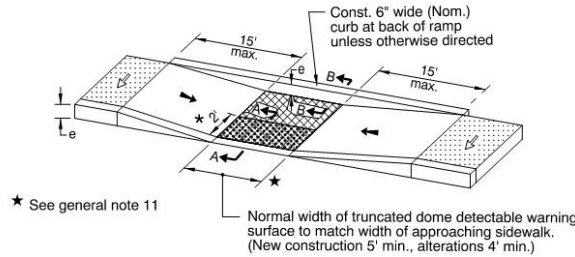


Design Approach – Standard Drawing

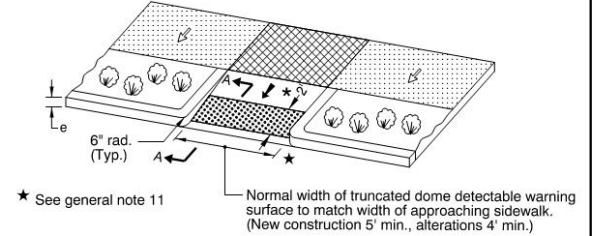
rd755.dgn 21-JUL-2015



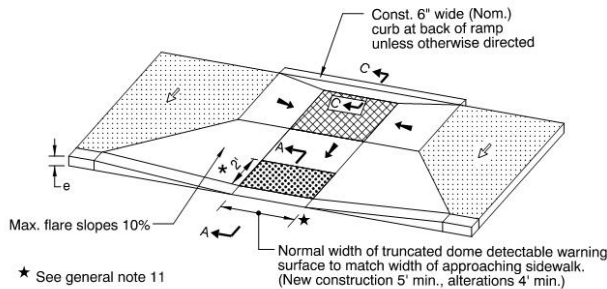
PERPENDICULAR SIDEWALK RAMP DETAIL
(Use "Parallel Sidewalk Ramp Detail" or "Combination Sidewalk Ramp Detail" when reqd. turning space cannot be obtained)



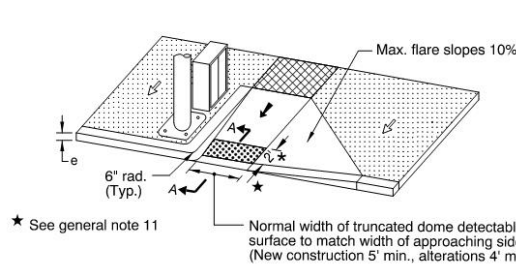
PARALLEL SIDEWALK RAMP DETAIL



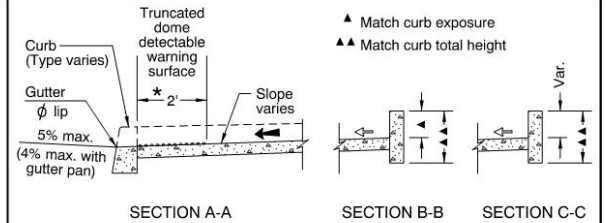
PERPENDICULAR SIDEWALK RAMP DETAIL (THROUGH BUFFER STRIP)



COMBINATION SIDEWALK RAMP DETAIL



PERPENDICULAR SIDEWALK RAMP DETAIL (WITH SINGLE FLARE)
(Use "Parallel Sidewalk Ramp Detail" or "Combination Sidewalk Ramp Detail" when reqd. turning space cannot be obtained)



- Sidewalk
- Turning space
Min. level area 4' x 4'
4' x 5' when constrained (with longer dimension in direction of ramp travel).
For the purposes of this application, a 2% maximum construction slope (for drainage) is considered level.
- Truncated dome detectable warning surface
- Slope 1.5% design (2% max. construction)
(Normal sidewalk cross slope)
- Slope 7.5% design (8.3% max. construction)
(Ramp length 15' max.)
- 2'
See general note 5

GENERAL NOTES FOR ALL DETAILS:

1. Sidewalk ramp details are based on United States Access Board Standards.
2. See Std. Drgs. RD700 & RD701 for curbs. See Std. Drg. RD720 for sidewalks. See Std. Drgs. TM503 & TM530 for crosswalk markings, widths, etc.
3. Tooled joints are required at all sidewalk ramp slope break lines.
4. Sidewalk curb ramp slopes shown are relative to the true level horizon (Zero bubble).
5. Place truncated dome detectable warning surface in the lower 2' adjacent to traffic of throat of ramp only. For details not shown, see Std. Drg. RD759.
6. Side flares that are not part of the path of travel may be any slope.
7. Sidewalk flare is not necessary where the ramp is protected from pedestrian cross-travel.

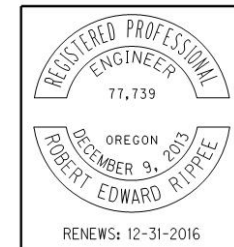
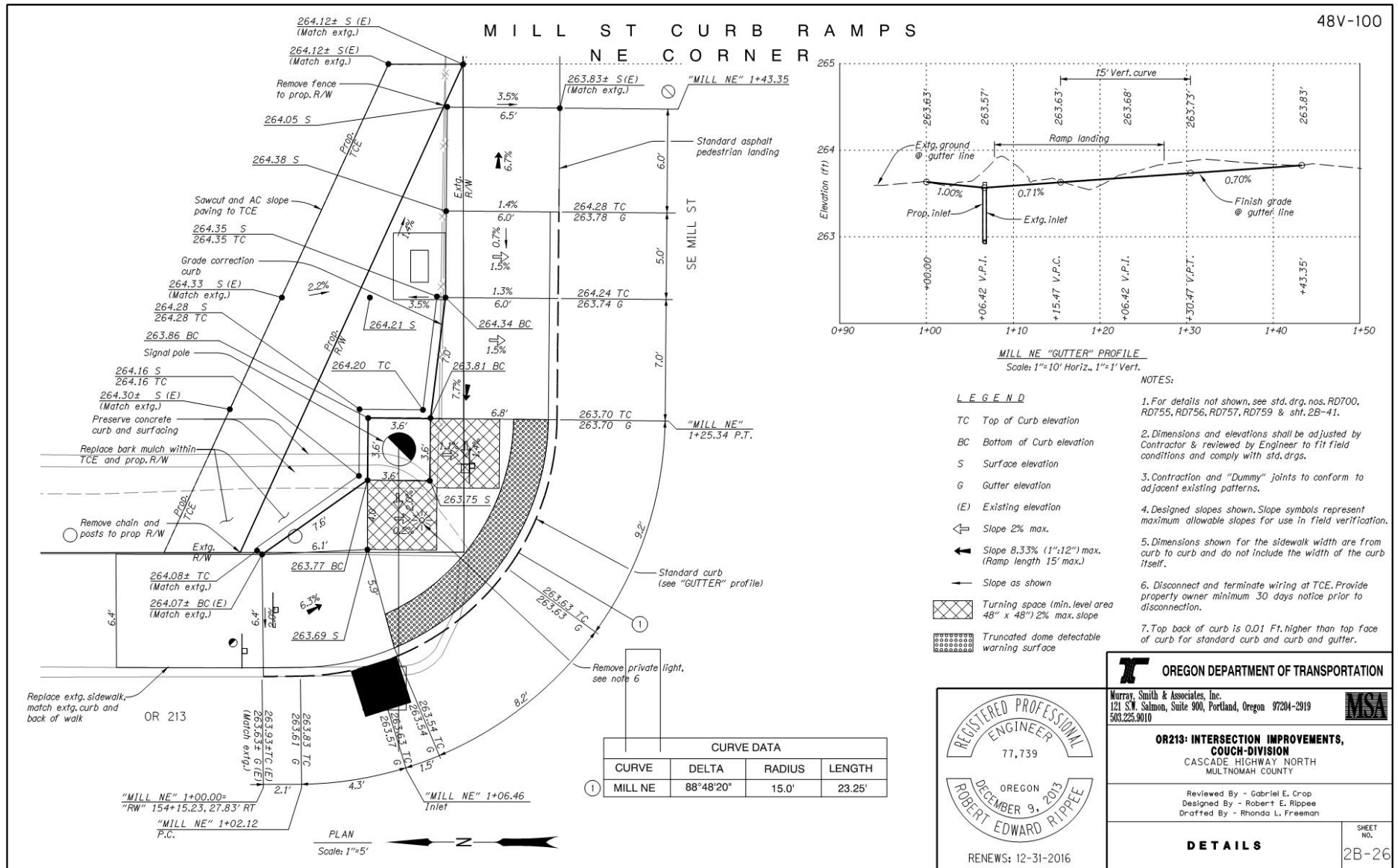
8. For the purpose of this drawing, a curb ramp is considered "perpendicular" if the angle between the longitudinal axis of the ramp and a line tangent to the curb at the ramp center is 75° or greater.
9. Ramps for paths intersecting a roadway should be full width of path, excluding flares. When a ramp is used to provide bicycle access from a roadway to a sidewalk, the ramp should be 8' wide.
10. For sidewalk ramp placement options, see Std. Drgs. RD756 & RD757.
11. Check the gutter flow depth at ramp locations to assure that the design flood does not overtop the back of sidewalk at ramp. If overtopping occurs place an inlet at upstream side of ramp or perform other approved design mitigation.
12. Only use details allowed by jurisdiction.
13. Site conditions normally require a project specific design. See project plans for details not shown.

CALC. BOOK NO. <u> N/A </u>	BASELINE REPORT DATE: <u> 21-JUL-2015 </u>
NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications	
OREGON STANDARD DRAWINGS	
SIDEWALK RAMP DETAILS	
2015	
DATE	REVISION DESCRIPTION
21-2015	REVISED & ADDED NOTES
07-2015	ADDED DETAIL & REVISED NOTES

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

RD755

Design Approach – Detailed Layout



OREGON DEPARTMENT OF TRANSPORTATION

Murray, Smith & Associates, Inc.
121 S.W. Salmon, Suite 900, Portland, Oregon 97204-2919
503.225.9010

**OR213: INTERSECTION IMPROVEMENTS,
COUCH-DIVISION**
CASCADE HIGHWAY NORTH
MULTNOMAH COUNTY

Reviewed By - Gabriel E. Croop
Designed By - Robert E. Rippee
Drafted By - Rhonda L. Freeman

SHEET NO.
2B-26

Curb ramp design spectrum

Standard Drawing Approach

- Least design cost
- High risk of not meeting ADA
- High risk of unknown impacts and construction change orders

What is the right blend?

Detailed Design Approach

- High design cost
- Relies on precise survey
- Can it be constructed?
- Trap of a “fool-proof” design

A Results-oriented Approach

- Targeted field measurements (no survey!)
- Basic detail for quantities and construction layout
- *Enhanced construction management*

Agencies Using This Approach

- Tigard, OR
- Lake Oswego, OR
- Oregon City, OR
- Roseburg, OR (sort of)
- Vancouver, WA
- Arlington, WA

Scoping

Street	From	To	ADT	Heavy Vehicles	Length (ft)	Area (ft ²)	Curb Ramp Corners to Reconstruct
Dartmouth St ¹	99W	Atlanta	8000	250	310	14880	2
78th Ave [*]	Pfaffle	99W	8000	200	330	13200	3
72nd Ave	99W	McD's Dwy	10000	400	400	20000	4
72nd Ave	217 Ramps	Beveland	13000	650	900	32400	10
Hunziker St	72nd Ave	7585 SW Hunziker	6500	250	1000	36000	3
72nd Ave	Fir St	Varns Rd	14500	400	500	22000	7
72nd Ave	City Limits	Upper Boones Ferry	10000	500	2600	104000	10
Walnut St ²	116th	122nd	9500	200	1300	52000	9
121st Ave ²	Tippitt	Ann Pl	8000	150	1000	42000	6
Royalty Pkwy	Naeve	99W	4000	80	1000	34000	6
Locust St ²	Greenburg	Hall	4000	80	2700	86400	14
Ventura Ct ³	Barbara	Alfred	800	10	1450	46400	2
74 ^{th3}	Barbara	Taylor's Ferry	700	10	1500	42000	5
Oak St	69th	71st	600	10	820	21320	0
Sandburg St ³	72nd Ave	End	2000	60	1500	54000	2
96th Ave ³	Murdock	Sattler	800	30	900	24300	3
Kable ³	98th	100th	1200	15	700	23800	4
109th Ave ³	Highland	Naeve	800	10	300	9600	9
Oak St	Hall	90th	2000	30	1400	42000	2
Sub-Total							101

Desktop Review



Untitled Map

Write a description for your map.

Legend

Google earth

© 2016 Google

3.99 ft

Field measurements

- No survey
- Use streetview images
- Dimensions
- Slopes
- Use available landmarks
- Take photos



Field measurements



Field sketches - Vancouver

Curb Ramp Evaluation

MSA

Murray, Smith & Associates, Inc.

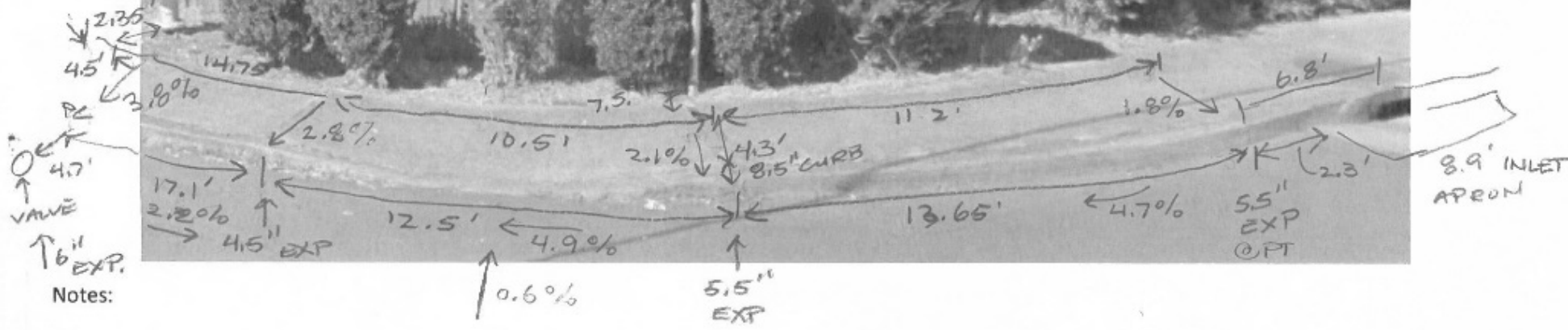
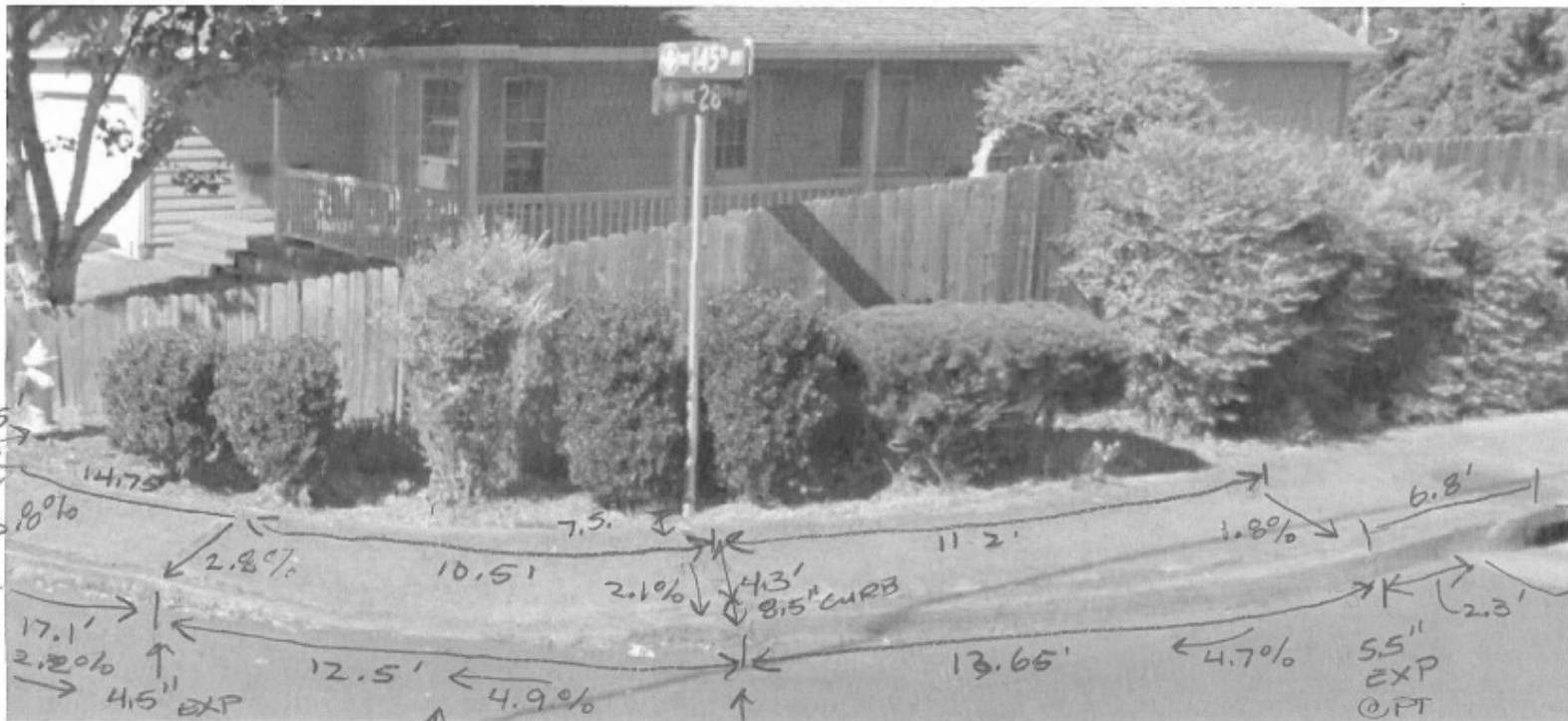
Date: 12/14/15

Client: City of Vancouver

Project: 2016 Curb Ramp & Street Striping

Data Collected by: RPS/AHG
SBB

002 - NE corner of NE 28th Street & 145th Avenue



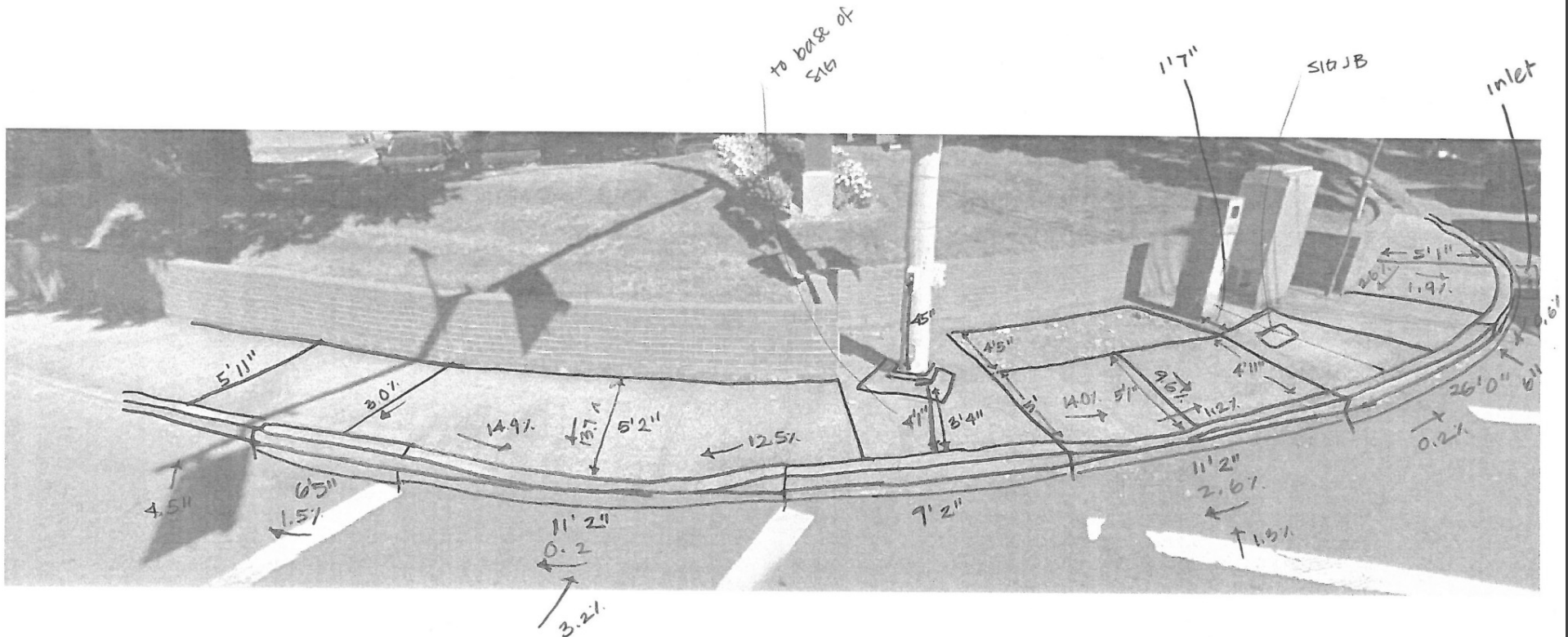
Notes:

Field sketches - Tigard

CAD: SBB

2/2/16
DME
ARC

SE 72nd & Upper Boones Fry (114-118)



If a Ramp Meets ADA, Document it

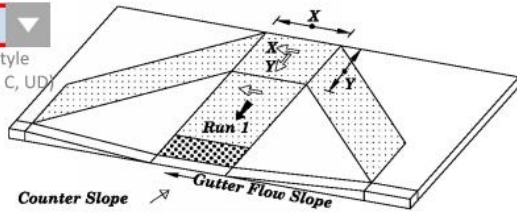


ADA Ramp Inspection Form

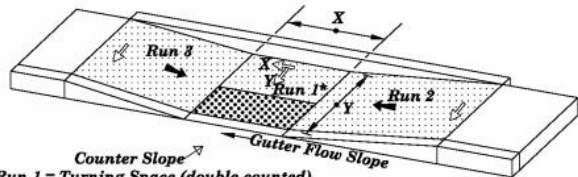
Submit by E-mail

Project Name (Section) _____ Construction Year _____ Contract No. _____ Highway No. _____ MP _____ Cross Street Name _____

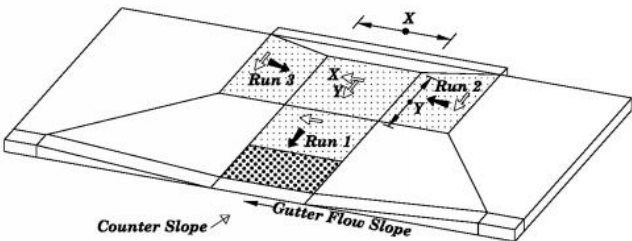
Ramp Style (PR, PL, C, UD)



PERPENDICULAR RAMP (PR)



PARALLEL RAMP (PL)



COMBINATION RAMP (C)

???

UNIQUE DESIGN (UD) - take photo

- Pedestrian Access Route (to measure clear width)
- Truncated dome detectable warning surface
- Cross Slope (2.0% max.)
- Running Slope (8.3% max.)
- Counter Slope (5.0% max.)
- Landing Area (X & Y) (2.0% max. / 4' x 4' min.)
- Gutter Flow Slope (as directed)

RAMP RUN 1 Pass Fail

Running Slope 1 ≤ 8.3% > 8.3%

Cross Slope 1 ≤ 2.0% > 2.0%

Detectable Warning (TD, X) None

Lip Height ≤ 1/4" > 1/4"

Gutter Flow Slope

Counter Slope (+/-) ≤ 5.0% > 5.0%

Slope Differential = Running Slope 1

+ Counter Slope

RAMP RUN 2 Pass Fail

Running Slope 2 ≤ 8.3% > 8.3%

Cross Slope 2 ≤ 2.0% > 2.0%

RAMP RUN 3 Pass Fail

Running Slope 3 ≤ 8.3% > 8.3%

Cross Slope 3 ≤ 2.0% > 2.0%

TURNING SPACE Pass Fail

Landing Width X ≥ 4' < 4'

Landing Length Y and or

Landing Slope X ≤ 2.0% > 2.0%

Landing Slope Y ≤ 2.0% > 2.0%

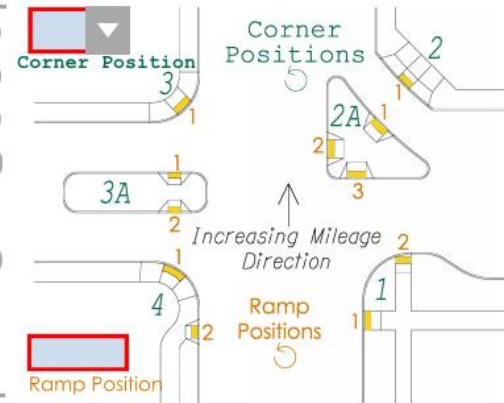
MISCELLANEOUS Pass Fail

Clear Width (feet) ≥ 4' < 4'

Physical Condition (G,F,P)

ADA Design Exception (Y,N)

Design Ex. Control Number



Function Condition (G,F,P)

Good (G) = all applicable boxes on left pass.
Fair (F) = all boxes on left pass, except detectable warning
Poor (P) = any box fails other than detectable warning

See also Standard Drawings RD755 and TM458 to assess provisions not shown: (flares, inlets, pushbutton reach, alignment, etc.)

Comment:

Inspector's Signature Date

Print name clearly Certification No.

Company/Agency Crew No. (ODOT)

Back at the office

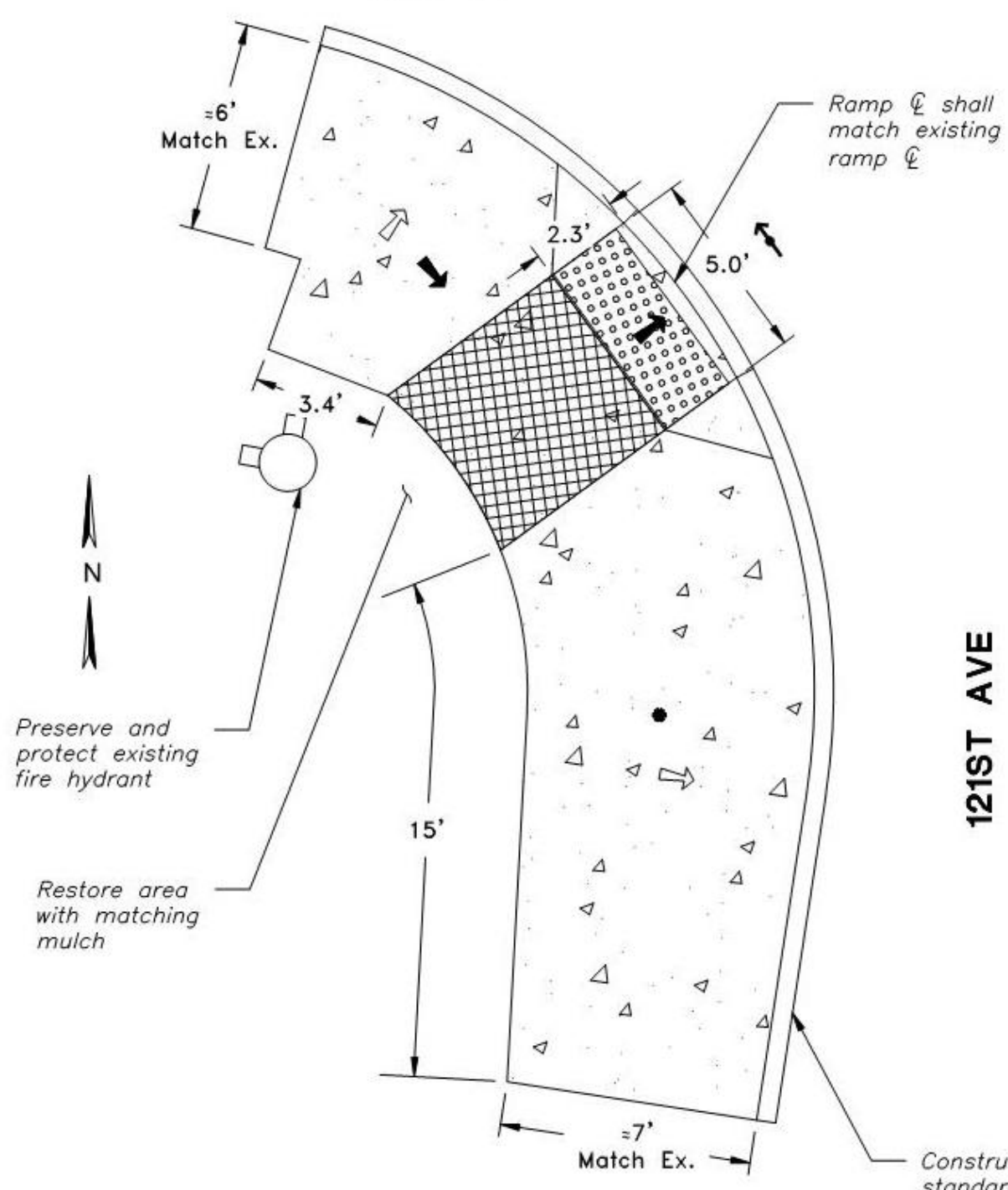
- Verify locations and replacement needs
- Determine if extra survey is needed
- Develop CAD sketch of ramp
 - Use field sketch measurements
 - Utilize Agency GIS or aerial photo as base
 - Add pertinent notes

Design process – key elements








- Design cross slope max to 1.5%
- Design running slope max of 7.5%
- Dimensions
- Slopes
- Stay within existing sidewalk limits
- Reference point for new ramp
- Transition panels
- Grade correction curbs
- Grade and utility adjustments
- Restoration requirements

SW CORNER


ANN PL



LEGEND

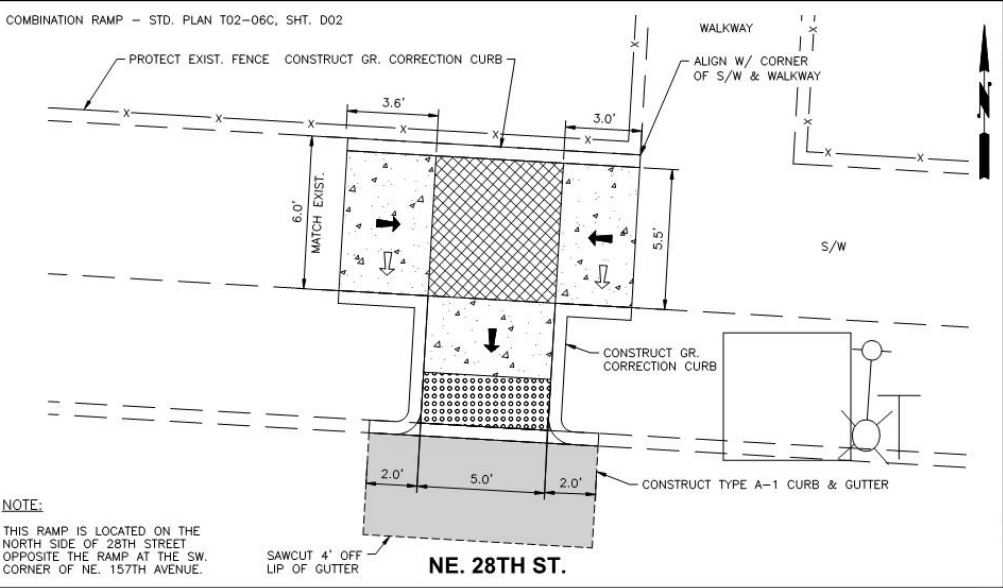
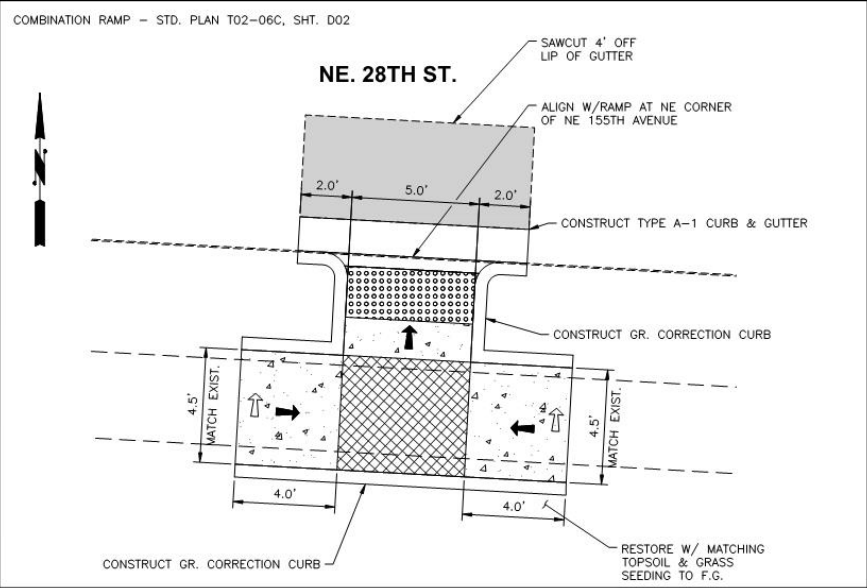
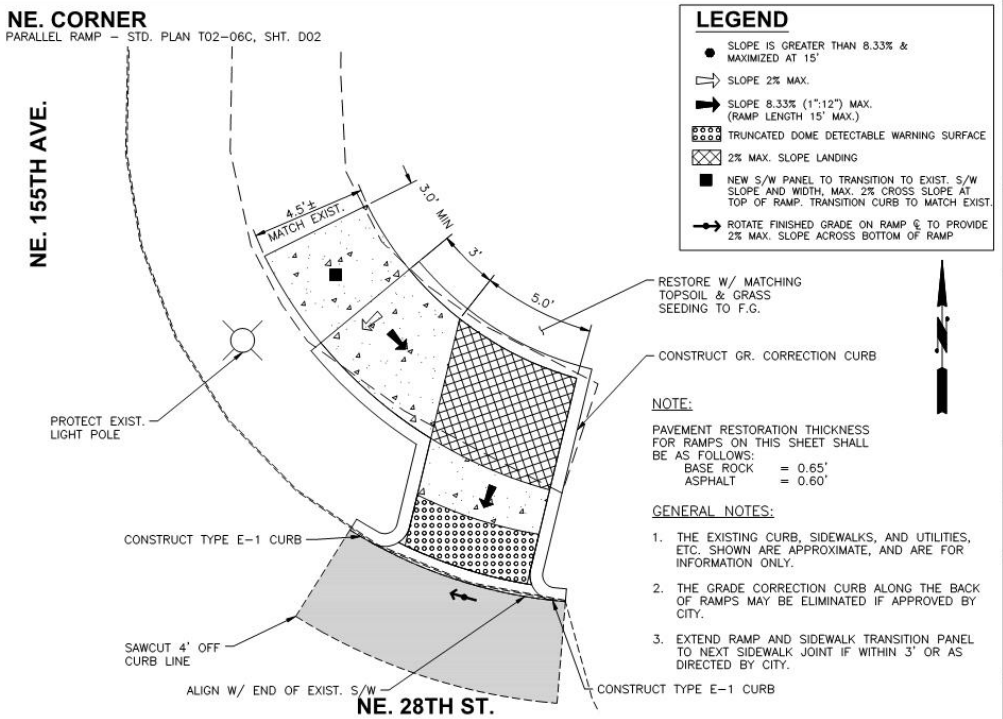
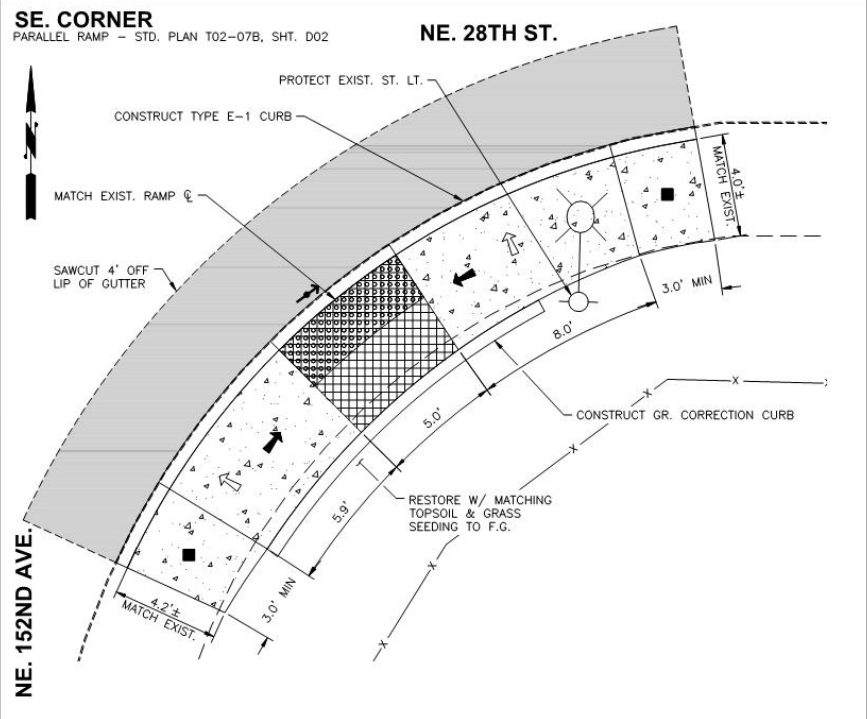
-  Slope is greater than 8.33% & maximized at 15'
-  Slope 2% max.
-  Slope 8.33% (1":12") max. (Ramp length 15' max. or to next sidewalk joint if <18")
-  Truncated dome detectable warning surface
-  2% max. slope landing
-  New s/w panel to transition to exist. s/w slope and width, max. 2% cross slope at top of ramp, transition curb to match exist.
-  Rotate finished grade on ramp ϕ to provide 2% max slope across bottom of ramp

GENERAL NOTES:

1. The existing curb, sidewalks, and utilities, etc. shown are approximate, and are for information only.
2. The grade correction curb along the back of ramps may be eliminated if approved by city.
3. Extend ramp and sidewalk transition panel to next sidewalk joint if within 3' or as directed by city.
4. When constructing curb & gutter, match the existing gutter pan width.
5. Cross-slope correction panels (those denoted with a ) are to be typically 4' in length, however final lengths to be determined by inspector in field.
6. These drawings are schematic in nature, the contractor is responsible to verify all dimensions and adjust as necessary to meet PROWAG.

121ST AVE

Example Sheet – Vancouver 2016



2016 RESURFACING CURB RAMPS RAMP DETAILS - NE. 28TH STREET

PROJECT NUMBER: **071816**
TASK NUMBER: **06.29.02**
C05
SHEET **9** OF 42

DATE: JAN 2016
DESIGNED BY: RFS
DRAWN BY: CAD
CHECKED BY: GEC
APPROVED BY: MTA
REVISIONS:

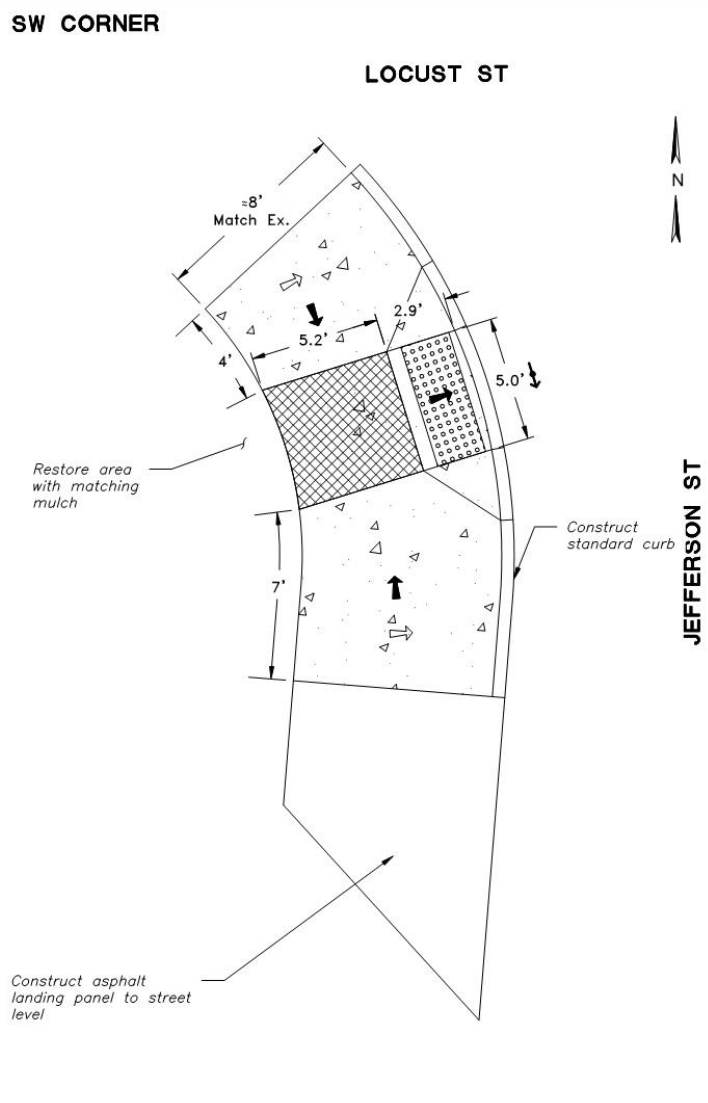
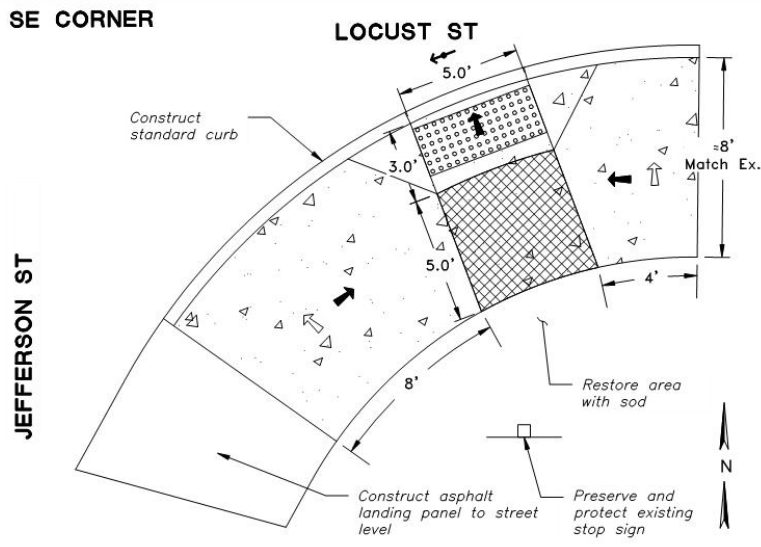
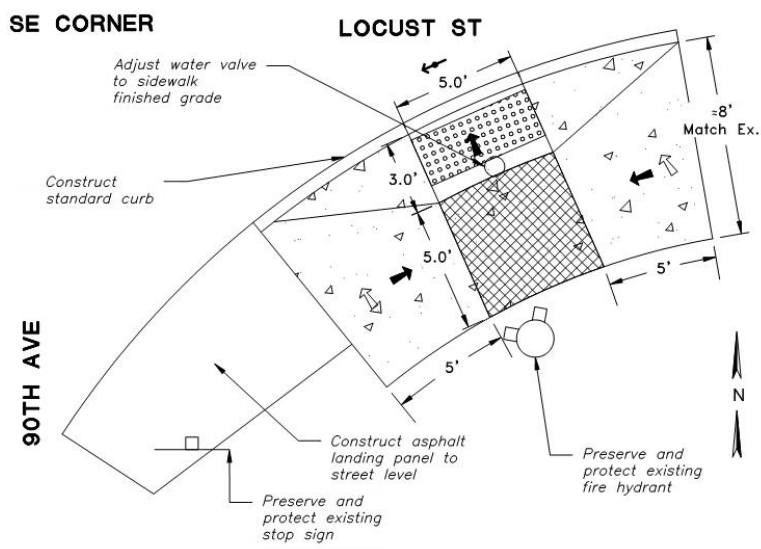
SCALE: HORIZONTAL: 1"=50'
VERTICAL: N/A

CALL US BEFORE YOU BIDD! "We're On Site"
MSA
Municipal Services Authority
15000 1st Avenue, Suite 100
Vancouver, BC V6P 1M5
TEL: 604-273-7272
FAX: 604-273-7276

PUBLIC WORKS TRANSPORTATION
P.O. BOX 1995
VANCOUVER, WA
98666-1995
980-487-7750
FAX: 980-487-4781

G:\PDX_PROJECTS\1517860 - VANCOUVER CURB RAMPS & STRIPING\CAD SHEETS\15-17860-01-WA-CR1.DWG 1/29/2016 5:22:47 PM Douglas Kuhnman

Example Sheet – Tigard 2016



LEGEND

- Slope is greater than 8.33% & maximized at 15'
- Slope 2% max.
- Slope 8.33% (1":12") max. (Ramp length 15' max. or to next sidewalk joint if <18")
- Truncated dome detectable warning surface
- 2% max. slope landing
- New s/w panel to transition to exist. s/w slope and width, max. 2% cross slope at top of ramp transition curb to match exist.
- Rotate finished grade on ramp ϕ to provide 2% max slope across bottom of ramp

- ### GENERAL NOTES:
1. The existing curb, sidewalks, and utilities, etc. shown are approximate, and are for information only.
 2. The grade correction curb along the back of ramps may be eliminated if approved by city.
 3. Extend ramp and sidewalk transition panel to next sidewalk joint if within 3' or as directed by city.
 4. When constructing curb & gutter, match the existing gutter pan width.
 5. Cross-slope correction panels (those denoted with a \blacksquare) are to be typically 4' in length, however final lengths to be determined by inspector in field.
 6. These drawings are schematic in nature, the contractor is responsible to verify all dimensions and adjust as necessary to meet PROWAG.



Plotted by: SNC/CLB/BURR on Wednesday, April 06, 2016 at 4:50:38 PM from the 11 DS layout tab
 File Name: Proj:\140_MSA-EP\COM\PORTLAND\PROJ\PROJECTS\16\1769 - Tigard\2016 PAVEMENT MANAGEMENT\CAD\SHEETS\16-1769-OR-06-06-D6.DWG

Revisions and Addendums			
Description	Date	No.	By

SCALE: 1" = 5'

DESIGN: SBB | DRAWN: SBB | CHECK: GEC | PROJECT NO: 2016-95001 OL

ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT

13125 S.W. HALL BLVD.
TIGARD, OREGON 97223
VOICE: 503-639-4171
FAX: 503-624-0752
WWW.TIGARD-OR.GOV

MSA
Murray, Smith & Associates, Inc.
Engineers/Planners
Portland, Oregon

TIGARD

FY 2016-17 PAVEMENT MANAGEMENT PROGRAM

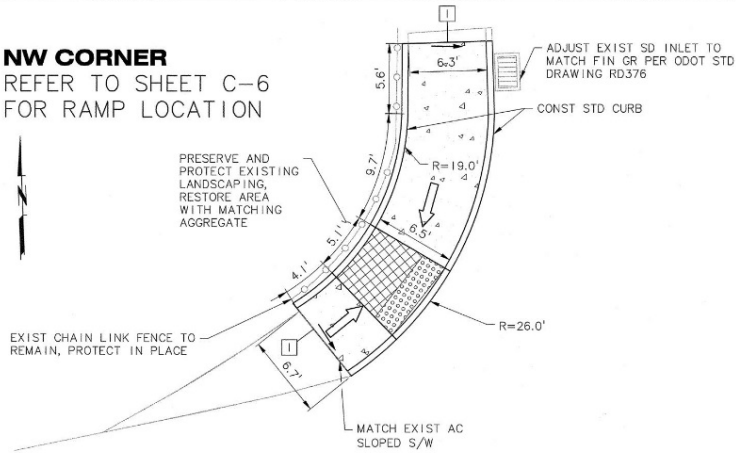
Pavement Rehabilitation

Sidewalk Ramp Details - Locust Street

SHEET	D6
OF	76

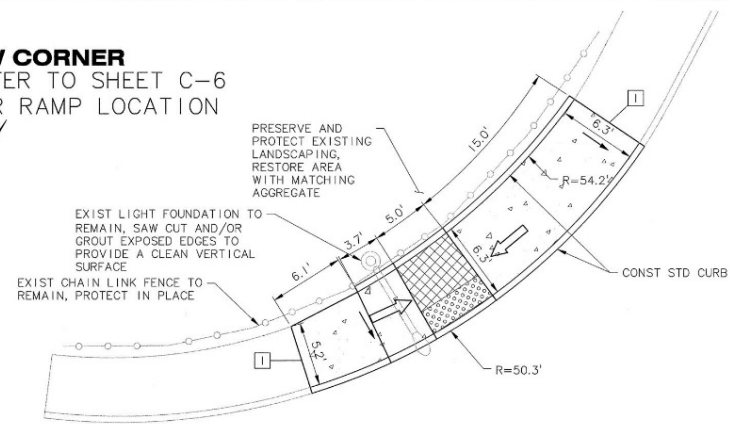
Example Sheet – Roseburg 2016

NW CORNER
REFER TO SHEET C-6
FOR RAMP LOCATION



NW EDENBOWER BLVD

NW CORNER
REFER TO SHEET C-6
FOR RAMP LOCATION



NW EDENBOWER BLVD.

BROAD ST

* SLOPE IF GREATER THAN 8.33%
 → SLOPE 8.33% (1":12" MAX (RAMP LENGTH 15' MAX)
 → SLOPE 2% (1":50" MAX

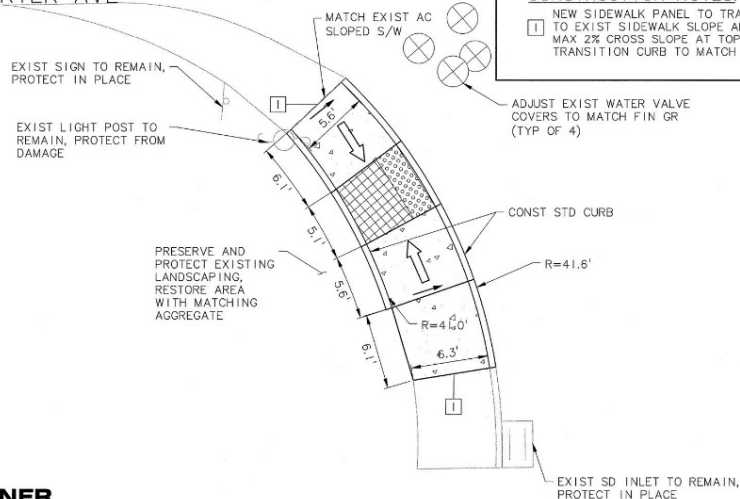
TRUNCATED DOME DETECTABLE WARNING SURFACE
 TURNING SPACE (MIN LEVEL AREA 48"x48") FOR THE PURPOSE OF THIS APPLICATION A 2% MAX SLOPE (FOR DRAINAGE) IS CONSIDERED LEVEL

GENERAL NOTES:
 1. APPLY SIDEWALK CLOSURES DURING CURB RAMP CONSTRUCTION PER ODOT STANDARD DRAWING TM844. APPLY SINGLE LANE CLOSURES PER ODOT STANDARD DRAWING TM841.
 2. WHEN CONSTRUCTING CURB AND GUTTER, MATCH EXIST GUTTER WIDTH.

CONSTRUCTION NOTES:
 NEW SIDEWALK PANEL TO TRANSITION TO EXIST SIDEWALK SLOPE AND WIDTH, MAX 2% GROSS SLOPE AT TOP OF RAMP, TRANSITION CURB TO MATCH EXIST.

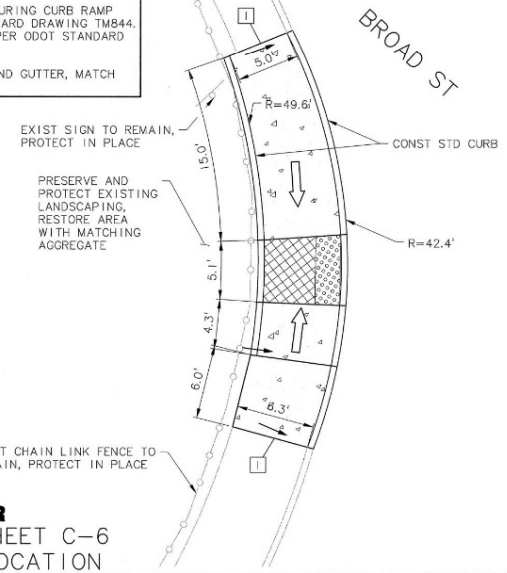
NW SWEETBRIER AVE

NW SWEETBRIER AVE



NW EDENBOWER BLVD

SW CORNER
REFER TO SHEET C-6
FOR RAMP LOCATION



NW EDENBOWER BLVD.

SW CORNER
REFER TO SHEET C-6
FOR RAMP LOCATION

NO.	DATE	BY	REVISION

NOTICE
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

RPS DESIGNED
 DKH/DAK DRAWN
 CSL CHECKED



MSA Murray, Smith & Associates, Inc.
 Engineers/Planners
 777 High Street, Suite 200 Eugene, Oregon 97401
 PHONE 541.741.2975 FAX 541.744.3875



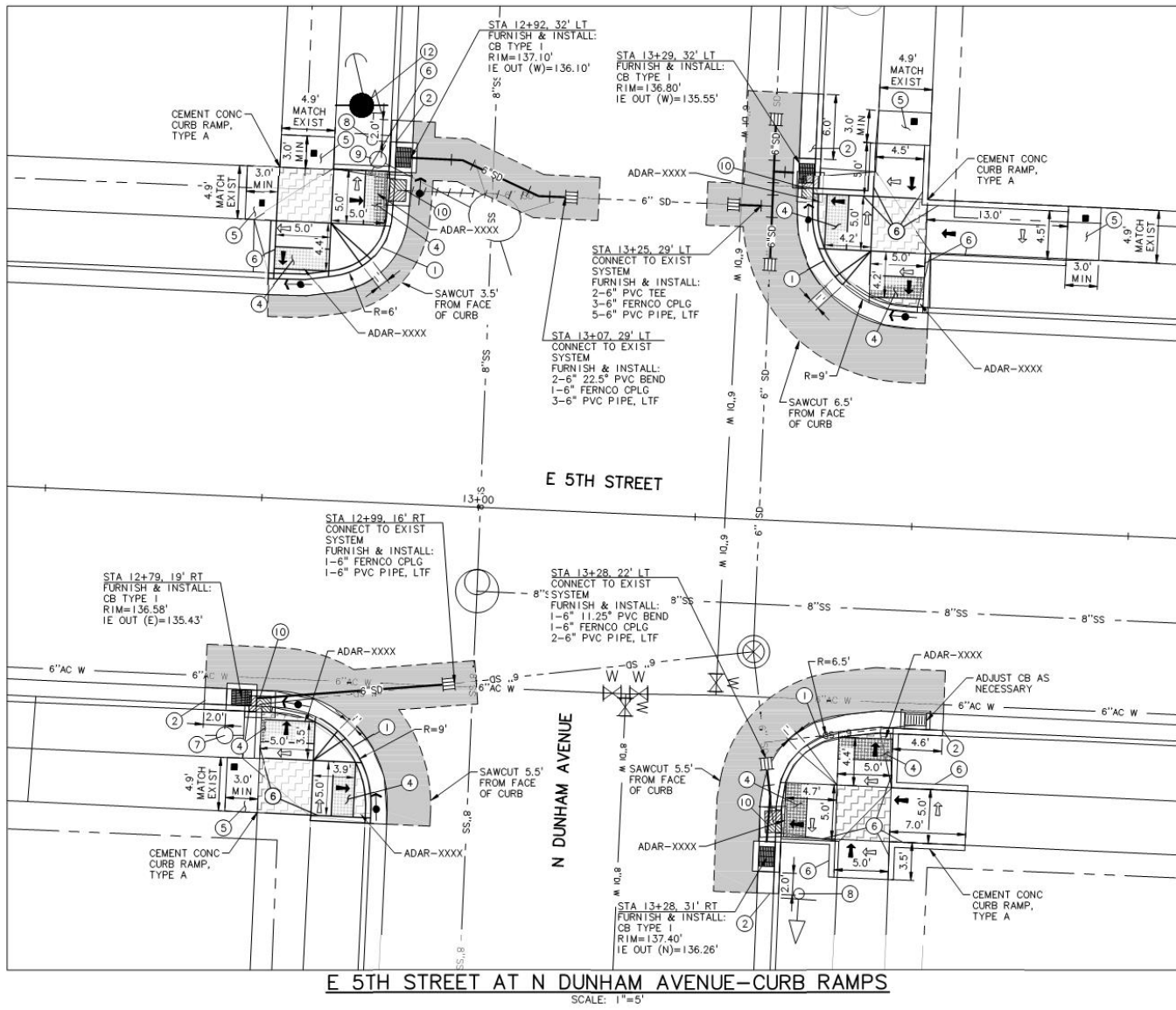
2016 PAVEMENT REHABILITATION PROJECTS PROJECT NO. 16PW01

DETAILS - NW EDENBOWER BLVD
 PROJECT NO.: 16-1796.205 SCALE: 1"=5' DATE: MAY 2016

SHEET
D-5
 23 of 29

C:\PDX_Projects\16-1796 - Roseburg 2016 Pavement Improvements\CAD\Sheet\16-1796-OR-C-DET.dwg 3:26 AM CDDY/CRAWFORD 20.0s (LMS Tech)

Example Sheet – Arlington 2016



KEY NOTES:

- ① CONSTRUCT DEPRESSED CURB PER WSDOT STD PLAN F-10.12, MAXIMUM CURB HEIGHT BETWEEN RAMPS OF 0.25'-FT
- ② CONSTRUCT CEMENT CONCRETE TRAFFIC CURB AND GUTTER PER WSDOT STD PLAN F-10.12, MATCH EXIST GUTTER WIDTH
- ③ CONSTRUCT CEMENT CONCRETE TRAFFIC CURB PER WSDOT STD PLAN F-10.12
- ④ FURNISH & INSTALL DETECTABLE WARNING SURFACE PER WSDOT STD PLAN F-45.10
- ⑤ CONSTRUCT CEMENT CONCRETE SIDEWALK PER WSDOT STD PLAN F-30.10
- ⑥ CONSTRUCT GRADE CORRECTION CURB PER DETAIL 1, SHEET RD9
- ⑦ PROTECT EXIST UTILITY POLE
- ⑧ PROTECT EXIST SIGN
- ⑨ EXIST UTILITY POLE TO BE REMOVED BY OTHERS
- ⑩ REMOVE CATCH BASIN
- ⑪ PROTECT FIRE HYDRANT
- ⑫ PROPOSED UTILITY POLE TO BE INSTALLED BY OTHERS

LEGEND

- * SLOPE IS GREATER THAN 8.33% & MAXIMIZED AT 15'
- ⇒ SLOPE 2% MAX
- ➔ SLOPE 8.33% (1":12") MAX (RAMP LENGTH 15' MAX)
- ▭ 2% MAX SLOPE IN ALL DIRECTIONS
- NEW S/W PANEL TO TRANSITION TO EXIST S/W SLOPE AND WIDTH, MAX 2% CROSS SLOPE AT TOP OF RAMP, ADJUST PANEL LENGTH TO MATCH NEAREST FULL DEPTH EXPANSION JOINT
- ➔ ADJUST FINISHED GRADE TO PROVIDE 2% MAX SLOPE ACROSS BOTTOM OF RAMP

NOTES:

1. REFER TO SHEET 2 FOR GENERAL AND ADA NOTES.
2. REFER TO WSDOT STANDARD PLANS F-40.12, F-40.14, F-40.15, AND F-40.16 FOR ADDITIONAL CURB RAMP INFORMATION.
3. EXTEND RAMP AND SIDEWALK TRANSITION PANEL TO NEXT SIDEWALK JOINT IF WITHIN 3' OR AS DIRECTED BY CITY.
4. REFER TO THE TYPICAL CURB RAMP REPLACEMENT, DETAIL 2, SHEET RD9 FOR ADDITIONAL MATERIAL AND CONSTRUCTION INFORMATION.
5. DETECTABLE WARNING SURFACES SHALL BE FIELD FITTED TO CURB RADIUS TO PROVIDE A CONTINUOUS EDGE ON BOTH THE FRONT AND BACK SIDES.
6. AT EXISTING AND PROPOSED CURB TIE-INS, MATCH THE CURB FACES AND EXISTING TOP OF CURB AND FLOWLINE ELEVATIONS.
7. MATCH PROPOSED RAMP CENTERLINES TO EXISTING RAMP OR SIDEWALK CENTERLINES UNLESS OTHERWISE SHOWN.
8. PLANTING STRIPS BETWEEN THE CURB AND SIDEWALK SHALL BE RESTORED WITH MATCHING TOPSOIL AND GRASS SEEDING TO FINISHED GRADE AT NO ADDITIONAL COST.
9. ALL EXISTING SURFACE FEATURES SUCH AS PLANTERS, LANDSCAPING, STRUCTURES, LOTS, CURBS, SIDEWALKS, FENCES, WALLS, MAILBOXES, SIGNS, GUY WIRES, PIPING, AND UTILITIES DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITION AT NO ADDITIONAL COST, UNLESS OTHERWISE PROPOSED.

E 5TH STREET AT N DUNHAM AVENUE—CURB RAMPS

SCALE: 1"=5'

H:\EXT_Projects\15\1754_Art_2016\Water & Pvm\CAD\Sheets\PM\T-5TH\15-1754-202-WA-CIVIL.dwg RD1: 5/5/2016 11:43 AM HCM 20.0s (LMS Tech)

NO.	DATE	BY	REVISION

NOTICE

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

ULTA
 DESIGNED
 BAW
 DRAWN
 GEC
 CHECKED



MSA Murray Smith & Associates, Inc.
 Engineers/Planners
 2707 Colby Avenue, Suite 1110 PHONE 425.252.9903
 Everett, Washington 98201-5566 FAX 425.252.8853



CITY OF ARLINGTON
 2016 PAVEMENT
 PRESERVATION
 PROJECT
 PROJECT No. P02.398

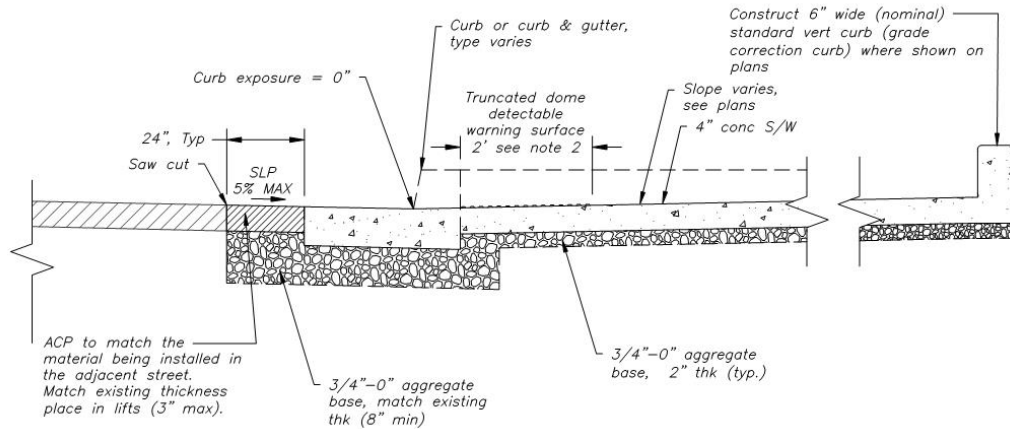
ROADWAY DETAILS/CURB RAMPS-1

PROJECT NO.: 15-1754-212 SCALE: AS SHOWN DATE: APRIL 2016

BID SET

SHEET
RD1
 31 of 39

Other Details



Notes:

1. Tooled joints are required at all sidewalk ramp slope break lines.
2. Place truncated dome detectable warning surface in the lower 2 feet adjacent to traffic of throat of ramp only.
3. Adjust curb profile within landing area as needed. Blend with existing street grade to minimize effect of change.

TYPICAL SIDEWALK RAMP REPLACEMENT SECTION

NTS

SIDEWALK RAMP GENERAL NOTES:

1. Contractor shall be responsible for meeting all Americans with Disabilities (ADA) requirements as defined by the public rights-of-way accessibility guidelines (PROWAG). Details and dimensions shown are approximate only and intended as a guide for initial layout purposes only and are not complete. Contractor shall take all necessary field measurements and otherwise verify all dimensions to meet ADA requirements. Should any error or inconsistency exist, the Contractor shall not proceed with the work affected until reported to the Engineer for clarification or correction.
2. No survey has been completed for these ramps. GIS mapping was used to create the project plan sheets and curb ramp details shown. Dimensions are approximate and shall be verified. Reference Oregon Standard Drawings RD700, RD720, RD755, RD756, RD757, RD759 for additional information.
3. All survey and staking necessary for construction shall be provided by the Contractor. The Contractor shall develop and make all detail surveys necessary for layout and construction. Complete all survey staking as needed using information contained in the plans and adjusted as necessary to meet ADA requirements. Additional information or clarification by the engineer may be available upon request, but is not guaranteed. Surveyed field layout shall be reviewed by the Engineer prior to demolition and again prior to concrete placement.
4. The maximum closure time for any single curb ramp shall be one week. Submit traffic control plan and pedestrian detour plan for ramp closures. Plan shall include but is not limited to work area protection, sidewalk closures and detours.
5. Coordinate utility relocations and/or adjustments as needed. See specifications for utility contact information.
6. Replace curbs, sidewalks, and/or driveway aprons that are damaged as a result of construction operations. Replace full sections to the nearest existing construction joint. Replacement will be considered incidental to the work.
7. Protect freshly poured concrete from vandalism or other damage for a minimum of twenty-four (24) hours or until cured enough to support typical use, whichever is longer. Any concrete damaged by vandalism or other causes shall be replaced at no cost to the city.
8. All areas disturbed through the construction of the sidewalk ramps shall be returned to their original condition prior to project completion. This includes, but is not limited to, landscape restoration around new ramps.
9. Contractor shall take extra care to avoid damaging any irrigation, wiring, or other facilities in the area to the new ramp. Any facilities encountered shall be relocated by the contractor without damage to an appropriate location outside the ramp/walk area.

Plotted by SINCLAIR BURR on Wednesday, April 06, 2016 at 4:49:48 PM from the 6 D1 layout tab
 File Name: P:\Data\USA-EP.COM\PORTLAND\POL-PROJECTS\1611789 - TIGARD 2016 PAVEMENT MANAGEMENT\CAD\ SHEETS\16-1789-OR-D1.DWG

Revisions and Addendums Description	Date	No.	By

NO SCALE


**ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT**
 13125 S.W. HALL BLVD.
 TIGARD, OREGON 97223
 VOICE: 503-639-4171
 FAX: 503-624-0752
 WWW.TIGARD-OR.GOV


MSA
 Murray, Smith & Associates, Inc.
 Engineers/Planners
 Portland, Oregon

FY 2016-17 PAVEMENT MANAGEMENT PROGRAM
Pavement Rehabilitation
Sidewalk Ramp Details



SHEET	D1
6	OF
76	

Construction

- Contract documents describe process and require contractor to meet ADA

6. These drawings are schematic in nature, the contractor is responsible to verify all dimensions and adjust as necessary to meet PROWAG.

- Pre-Pour field meeting
- Inspector with ADA training

Construction Process

- Pre-Pour Meeting (prime and concrete sub)
 - Walk through inspection process
 - Reiterate expectations
 - Gauge subcontractor expertise
- Mark demolition limits
- Demo and prep
- Check forms
- Check finished ramp

Demolition Limits



Checking Forms



Checking Forms





Before



After



Before



After



Before



After

Results

- Meet ADA
- Minimize change orders
- Reasonable design cost
- Process transferable between agencies



Questions?

