

What Curb Ramp Design Process is Right for You?

murraysmith



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Goals for the Presentation

- Address the “how” for dealing with ADA
- Provide options to choose from
- Consider what works for your agency



How many Engineers does it take to check a curb ramp?





Table of Contents



01. Overview of design approaches



02. Detailed design



03. Grading plan



04. Enhanced Design-Build



05. Design-Build



Effect of including curb ramps with resurfacing projects

- Up to 30% increase in construction cost
- Additional:
 - Design effort
 - Impacts to signals, ROW, accesses
 - Concrete subcontractors
 - Inspection/CM
- Combined or Separate Contracts?





Overview- Curb ramp design spectrum

Standard Drawing Approach

- Why: 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

- Why: To mitigate risks
- High design cost
- Relies on precise survey
- Trap of a “fool-proof” design

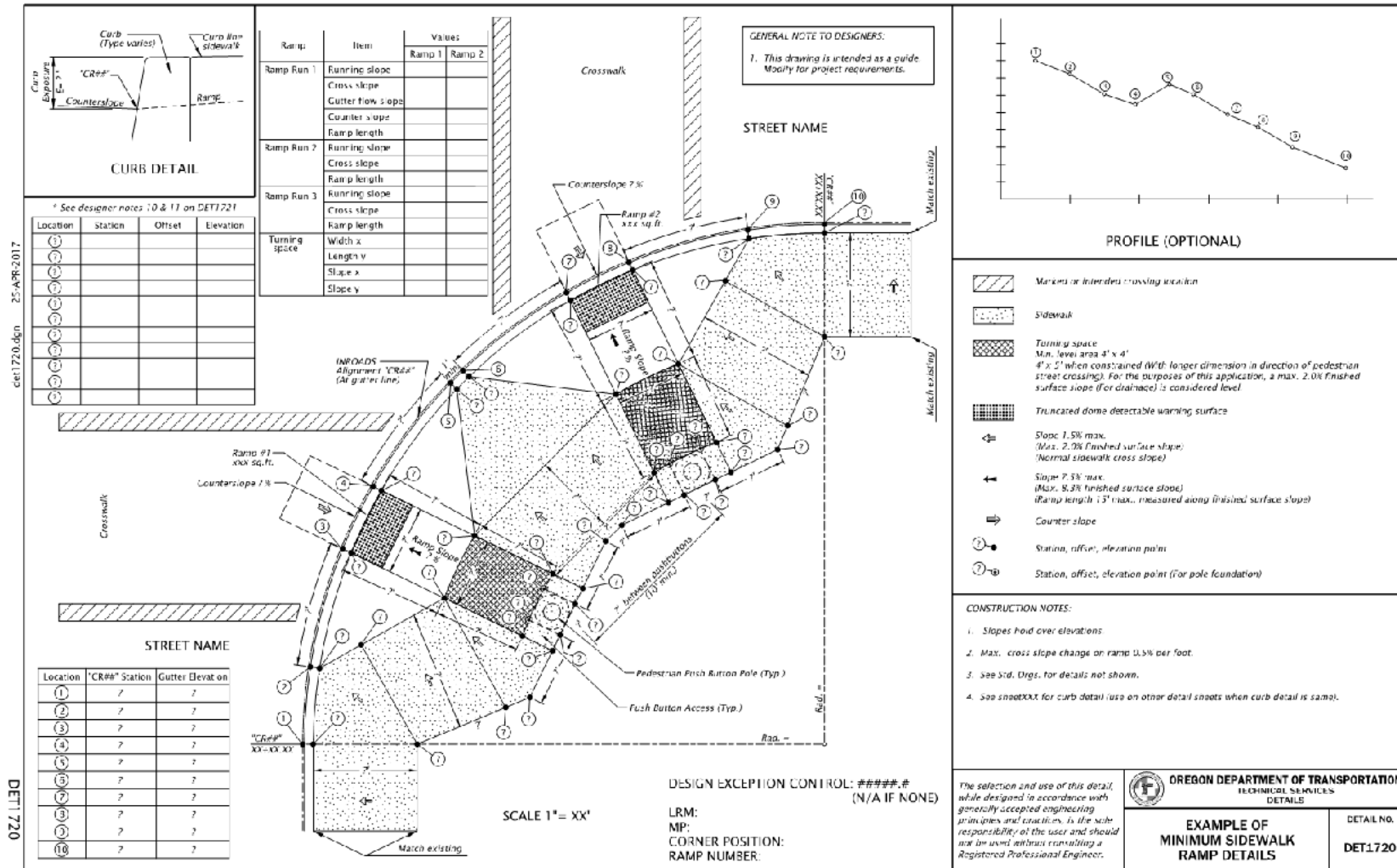


Overview – Standard Drawing

<p>Max. flare slopes 10.0% Curb and gutter (See general note 14) Normal width of detectable warning surface to match width of approaching sidewalk (Curb ramp width 4' min.) ★ See general note 11</p> <p>PERPENDICULAR CURB RAMP DETAIL (Use "Parallel Curb Ramp Detail" or "Combination Curb Ramp Detail" when req. turning space cannot be obtained)</p>	<p>Const. 6" wide (Nom.) curb at back of curb ramp unless otherwise directed Curb and gutter (See general note 14) Normal width of detectable warning surface to match width of approaching sidewalk (Curb ramp width 4' min.) ★ See general note 11</p> <p>PARALLEL CURB RAMP DETAIL</p>	<p>Return curb (Typ.) (See general note 7) Buffer strip (Typ.) 6" rad. (Typ.) Curb and gutter (See general note 14) Normal width of detectable warning surface to match width of approaching sidewalk (Curb ramp width 4' min.)</p> <p>PERPENDICULAR CURB RAMP DETAIL (THROUGH BUFFER STRIP)</p>	
<p>Max. flare slopes 10.0% Curb and gutter (See general note 14) Normal width of detectable warning surface to match width of approaching sidewalk (Curb ramp width 4' min.) ★ See general note 11</p> <p>COMBINATION CURB RAMP DETAIL</p>	<p>Return curb (Typ.) (See general note 7) 6" rad. (Typ.) Normal width of detectable warning surface to match width of approaching sidewalk (Curb ramp width 4' min.) Curb and gutter (See general note 14) ★ See general note 11</p> <p>PERPENDICULAR CURB RAMP DETAIL (WITH SINGLE FLARE) (Use "Parallel Curb Ramp Detail" or "Combination Curb Ramp Detail" when req. turning space cannot be obtained)</p>	<p>▲ Match curb exposure (Type varies) ▲▲ Match curb total height Pay limit Pay limit Curb and gutter (Type varies) Detectable warning surface Slope 4.0% max. at curb ramp (Max. 5.0% finished surface slope) Slope varies SECTION A-A SECTION B-B SECTION C-C</p> <p>Legend: Sidewalk Turning space: With no constrained 4.5'x4.5' nominal, 4'x4' min. With constrained 4.5'x5.5' nominal, 4'x5' min. (with longer dimension in direction of pedestrian street crossing). For the purposes of this application, a max. 7.0% finished surface slope (in drainage) is considered level. Detectable warning surface: ◀ Slope 1.5% max. (Max. 2.0% finished surface slope; (Normal sidewalk cross slope) ← Slope 7.5% max. (Max. 8.3% finished surface slope) 2' See general note 5</p>	
<p>GENERAL NOTES FOR ALL DETAILS:</p> <ol style="list-style-type: none"> Curb ramp details are based on CDOT applicable standards. See Std. Dwg. RD703 & RD701 for curbs. See Std. Dwg. RD770 for sidewalks. See Std. Dwg. TMS03 & TMS30 for crosswalk markings, sidewalks, etc. Tooled joints are required at all curb ramp slope break lines. Curb ramp slopes shown are relative to the true level horizon (zero bubble). Place detectable warning surface in the lower 2' adjacent to traffic of throat of curb ramp only. For details not shown, see Std. Dwg. RD758 & RD759. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface voids that meet at grade breaks shall be flush. Return curb may be provided in lieu of flared curb only if provided from traverse by landscaping or fixed barrier. Return curb shall not reduce width of approaching sidewalk. For the purpose of this drawing, a curb ramp is considered "perpendicular" if the angle between the longitudinal axis of the curb ramp and a line tangent to the curb at the curb ramp center is 75° or greater. Curb ramps for paths intersecting a roadway should be full width of path, excluding flares. When a curb ramp is used to provide bicycle access from a roadway to a sidewalk, the curb ramp should be 8' wide. For curb ramp placement options, see Std. Dwg. RD756 & RD757. Check the gutter flow depth at curb ramp locations to assure that the design flood does not overtop the back of sidewalk at curb ramps. If overtopping occurs, place an inlet at upstream side of curb ramp or perform other approved design mitigation. Only use details allowed by jurisdiction. Site conditions normally require a project specific design. See project plans for details not shown. On or along state highways, curb and gutter is required at curb ramps. 			<p>C.A. I. (RD 755) - N/A - - - - -</p> <p>REVISIONS: 1 - 15 JUL 2018</p> <p>OREGON STANDARD DRAWINGS</p> <p>CURB RAMP DETAILS</p> <p>2018</p> <p>DATE: 01-2018 REVISION: REVISED DETAILS, REVISED ADDED NOTES DATE: 07-2010 REVISION: REVISED DETAILS, REVISED ADDED NOTES</p>



Overview – Detailed Layout



DET1720.dgn 25-APR-2017

DET1720

OREGON DEPARTMENT OF TRANSPORTATION
TECHNICAL SERVICES
DETAILS

EXAMPLE OF MINIMUM SIDEWALK RAMP DETAILS

DETAIL NO. **DET1720**

The selection and use of this detail, 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.



Overview – Curb ramp design spectrum

Standard
Drawings

Design-Build

Enhanced
Design-Build

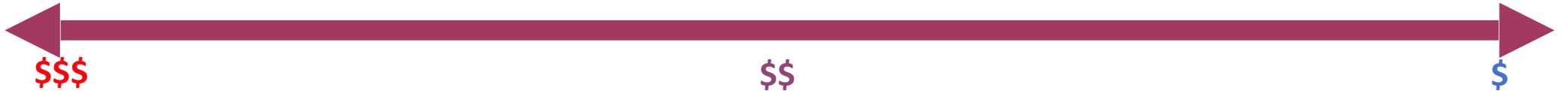
Grading
Plan

Detailed
Design



City/County Pavement Management Projects

RISK



COST





Design Approach – Detailed Design

- Detailed topographic survey and existing ROW retracement
- 2D and 3D curb ramp design detailed enough to:
 - identify technical feasibility (designer and reviewer)
 - Identify ROW needs (TE's and PE's)
 - provide **all** of the information necessary for a Contractor

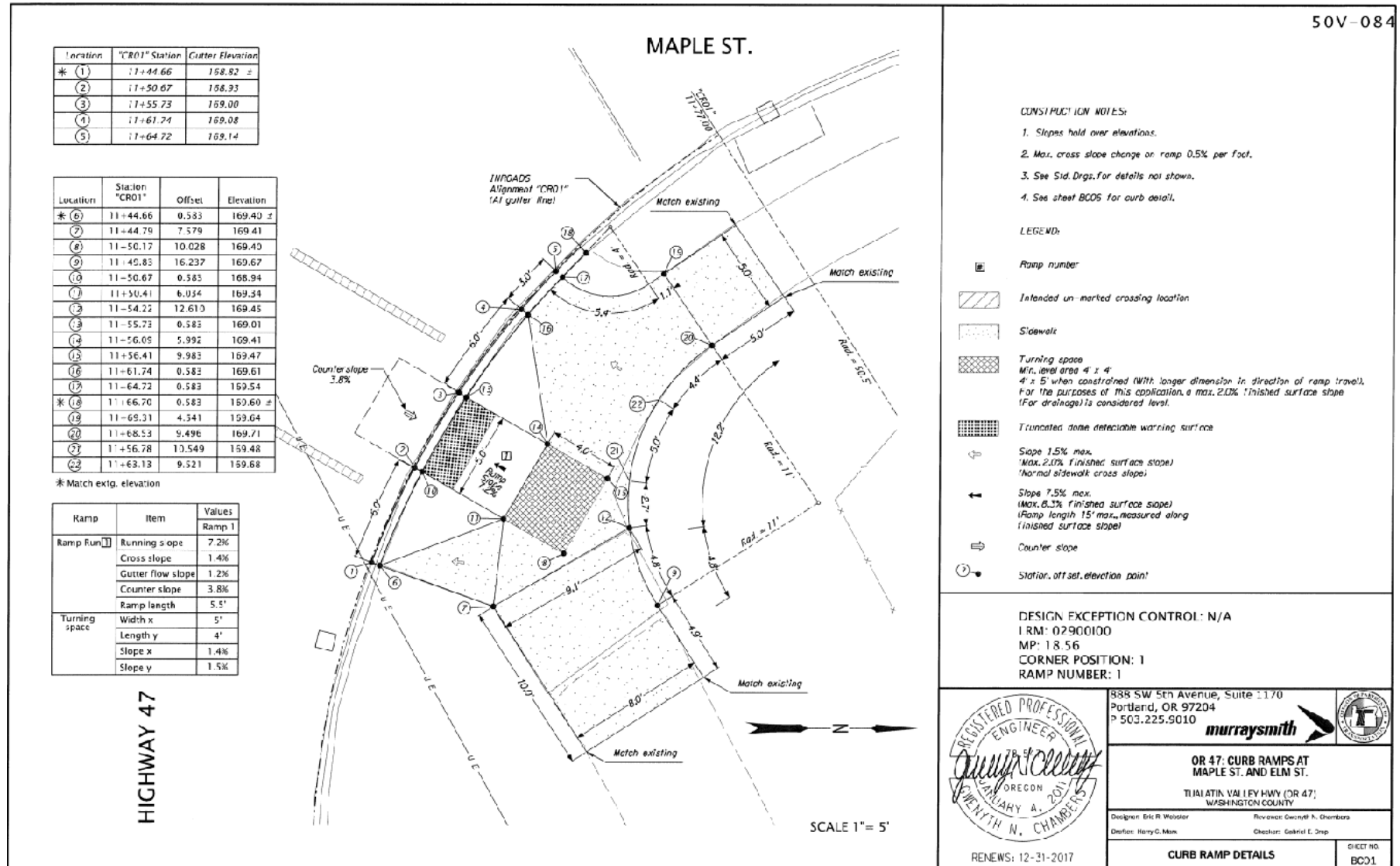


Design Approach – Detailed Design

- 1 ½ day long ODOT-based Designer Training Available
- 10 modules
 1. Overview & Definitions
 2. Milestones and LRM
 3. Design Triggers & Scoping
 4. DAP
 5. Pedestrian Traffic Control
 6. Curb Ramp Checklist
 7. Crosswalk Closures
 8. Specifications
 9. Inspection form
 10. Contacts

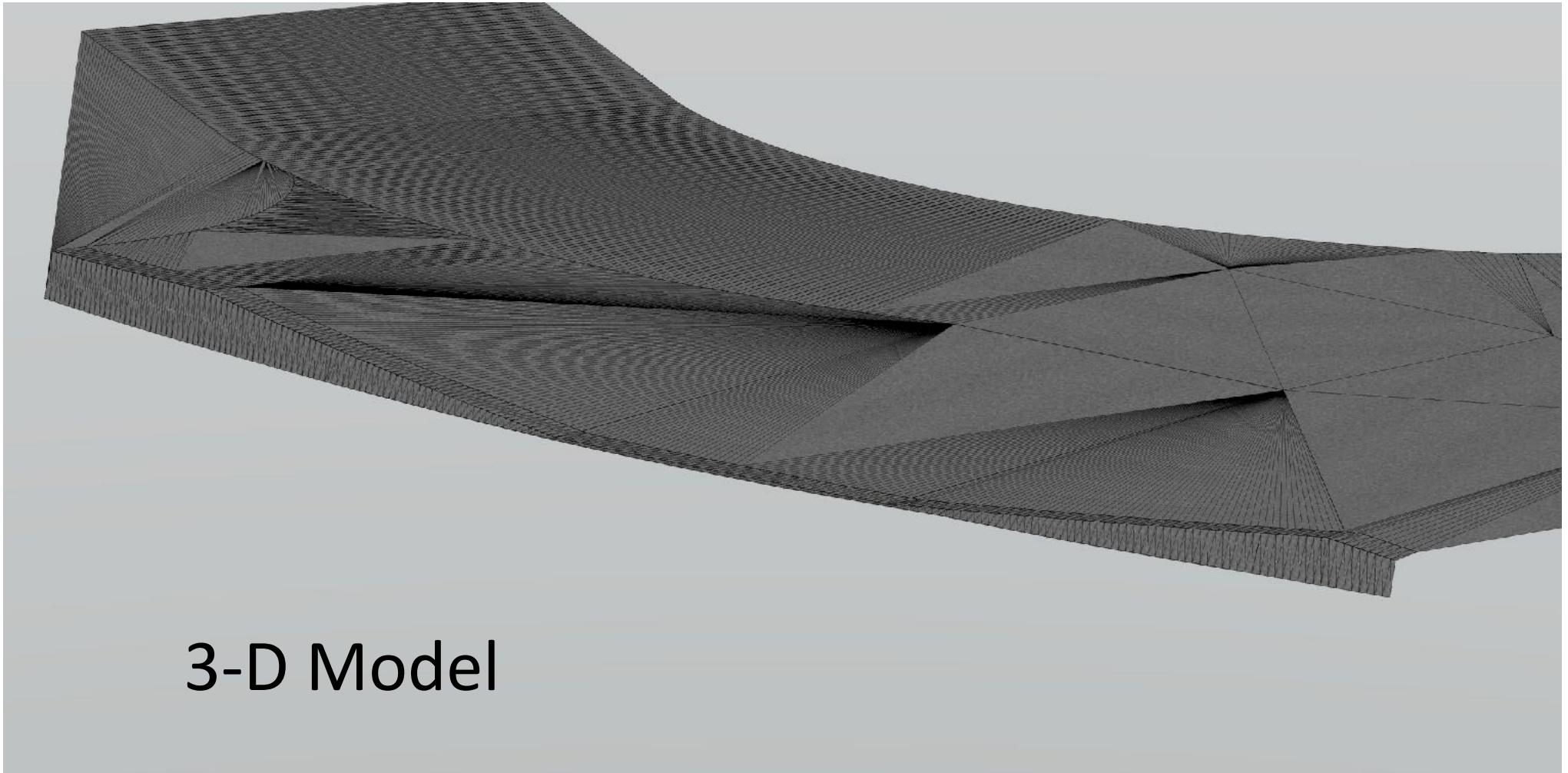


Design Approach – Detailed Design





Design Approach – Detailed Design

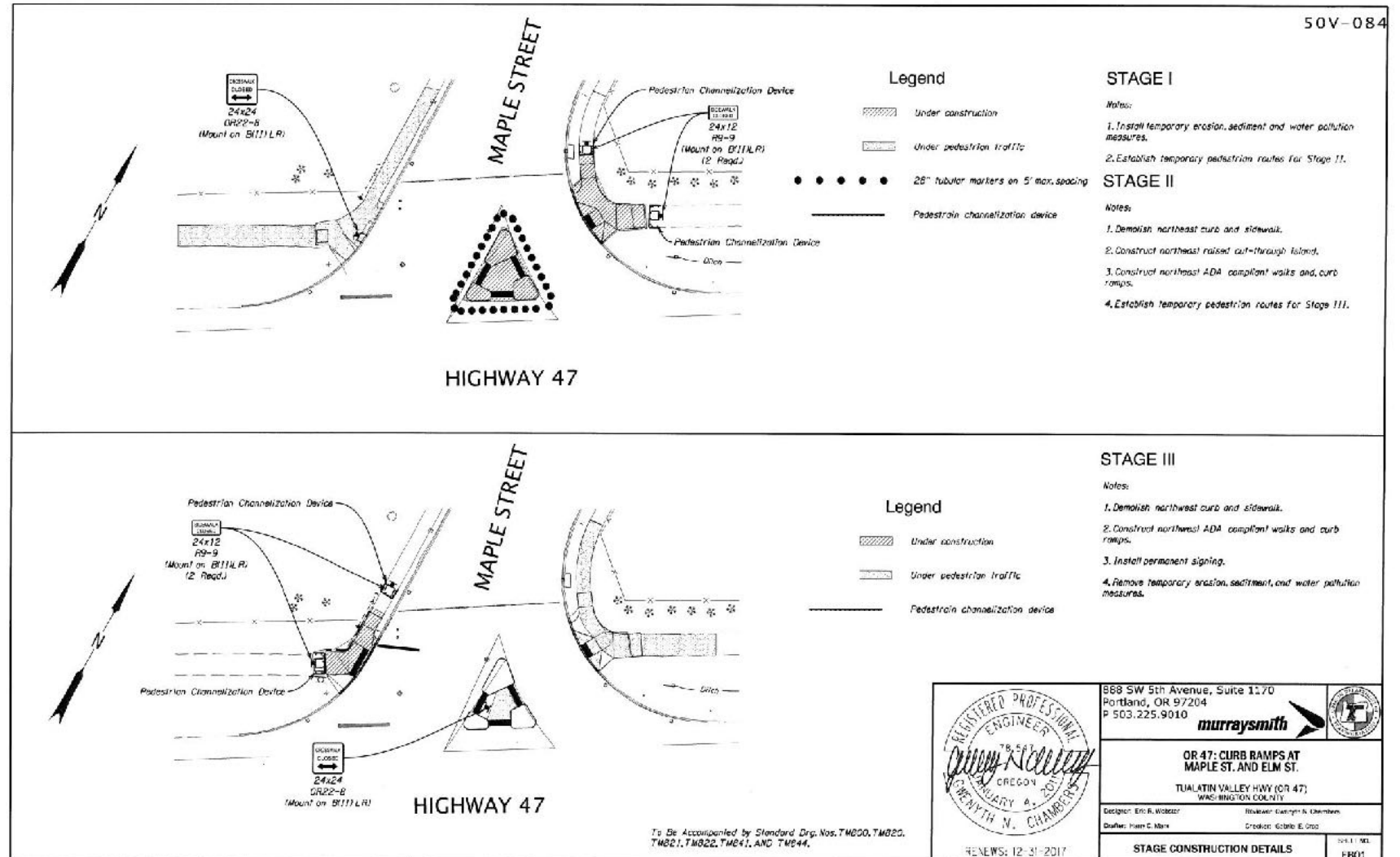


3-D Model



Design Approach – Detailed Design

Temporary pedestrian routing





Design Approach – Detailed Design



Before



After



Design Approach – Detailed Design

Takeaways:

- All known risks addressed during design
- Higher design AND construction cost
- Only possible to meet schedule due to no ROW, signal or other impacts
- Robust construction oversight still required



Design Approach – Detailed Design

Agencies using this approach:

- ODOT
- Others?

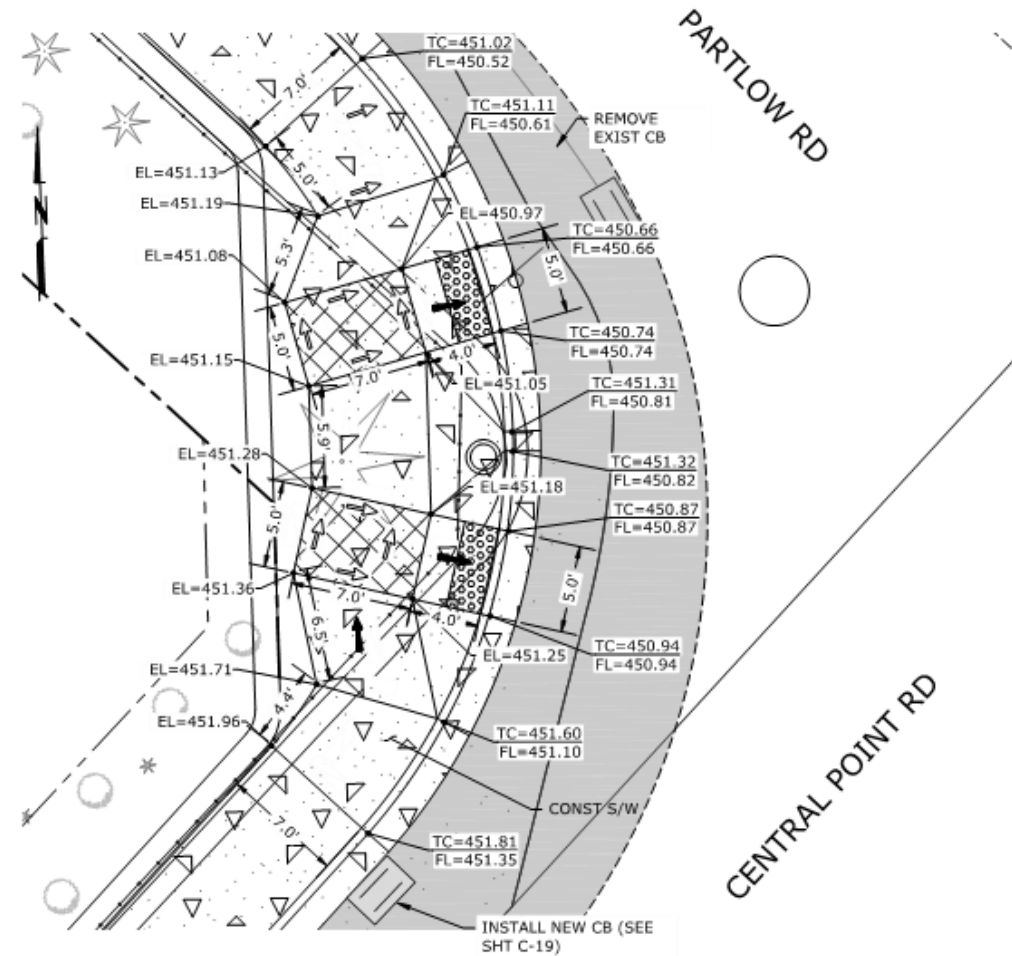


Design Approach – Grading Plan

- Similar process to the detailed design
- Less data on the plan sheet
- Detailed topographic survey and existing ROW retracement
- 2D and 3D curb ramp design detailed enough to:
 - identify technical feasibility (mostly designer verification)
 - Identify ROW needs (TE's and PE's)
 - provide **much** of the information necessary for a Contractor



Design Approach – Grading Plan



CORNER #36: PARTLOW ROAD AND CENTRAL POINT ROAD
SCALE: 1:5





Design Approach – Grading Plan



Before



After



Design Approach – Grading Plan

Takeaways:

- Major known risks addressed during design
- Controlled design and construction cost
- Enables Engineer to verify ADA conformance
- No model or means to perform construction survey
- Necessary for enhancements rather than retrofits
- Robust construction oversight still required



Design Approach – Grading Plan

Agencies using this approach:

- Portland
- Clackamas County
- McMinnville
- Oregon City
- Lake Oswego
- Others?

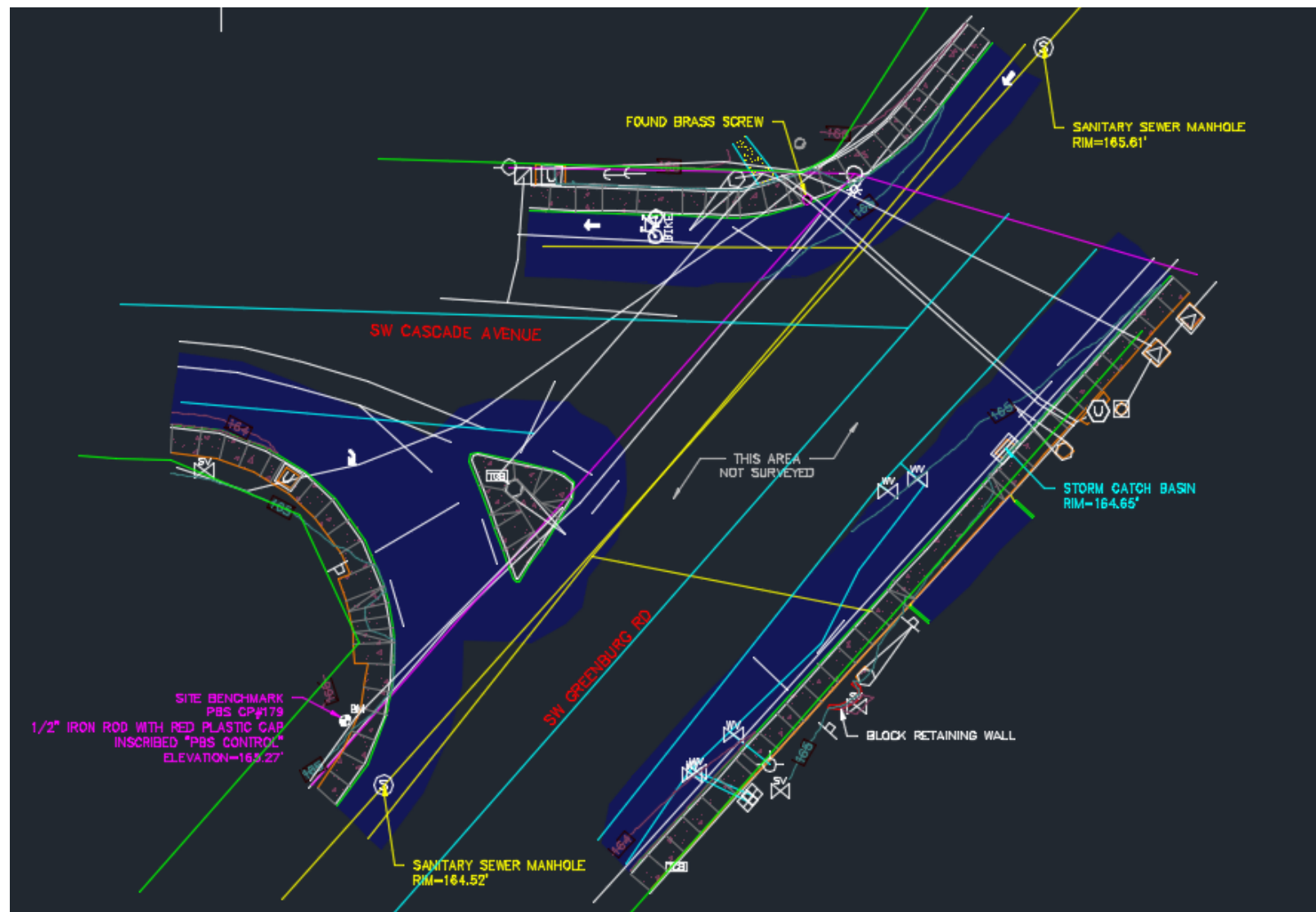


Design Approach – Enhanced Design-Build

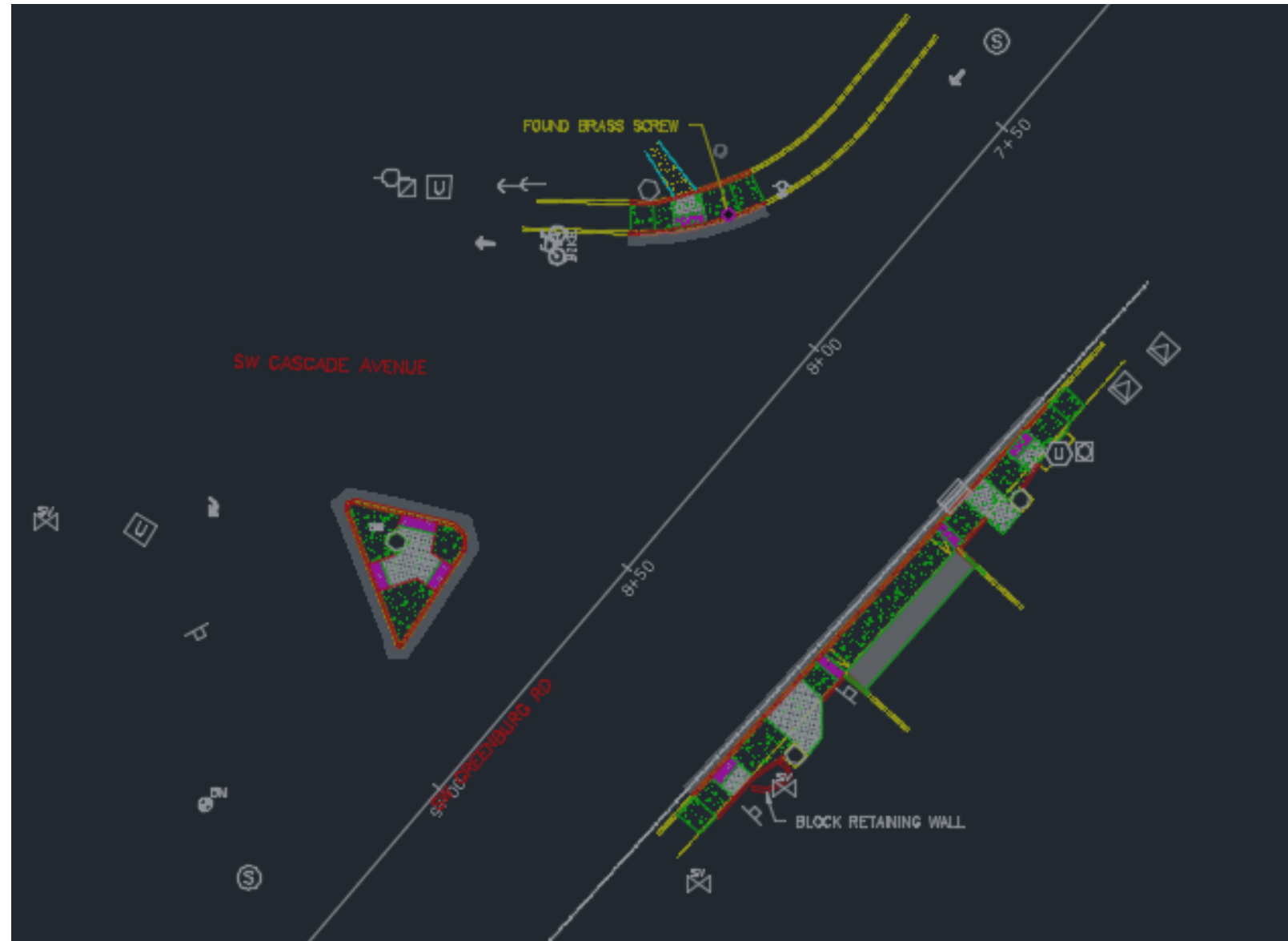
- Reduced effort for plan sheet development
- Relies on detailed topographic survey as the basemap
- 2D and 3D curb ramp design detailed enough to:
 - identify technical feasibility (all designer verification)
 - Identify ROW needs (TE's and PE's)
- Survey used internally – No grading plans developed
- Schematic plans with **only** enough information to address quantities, impacts, and initial layout
- Contractor coordination required



Design Approach – Enhanced Design-Build

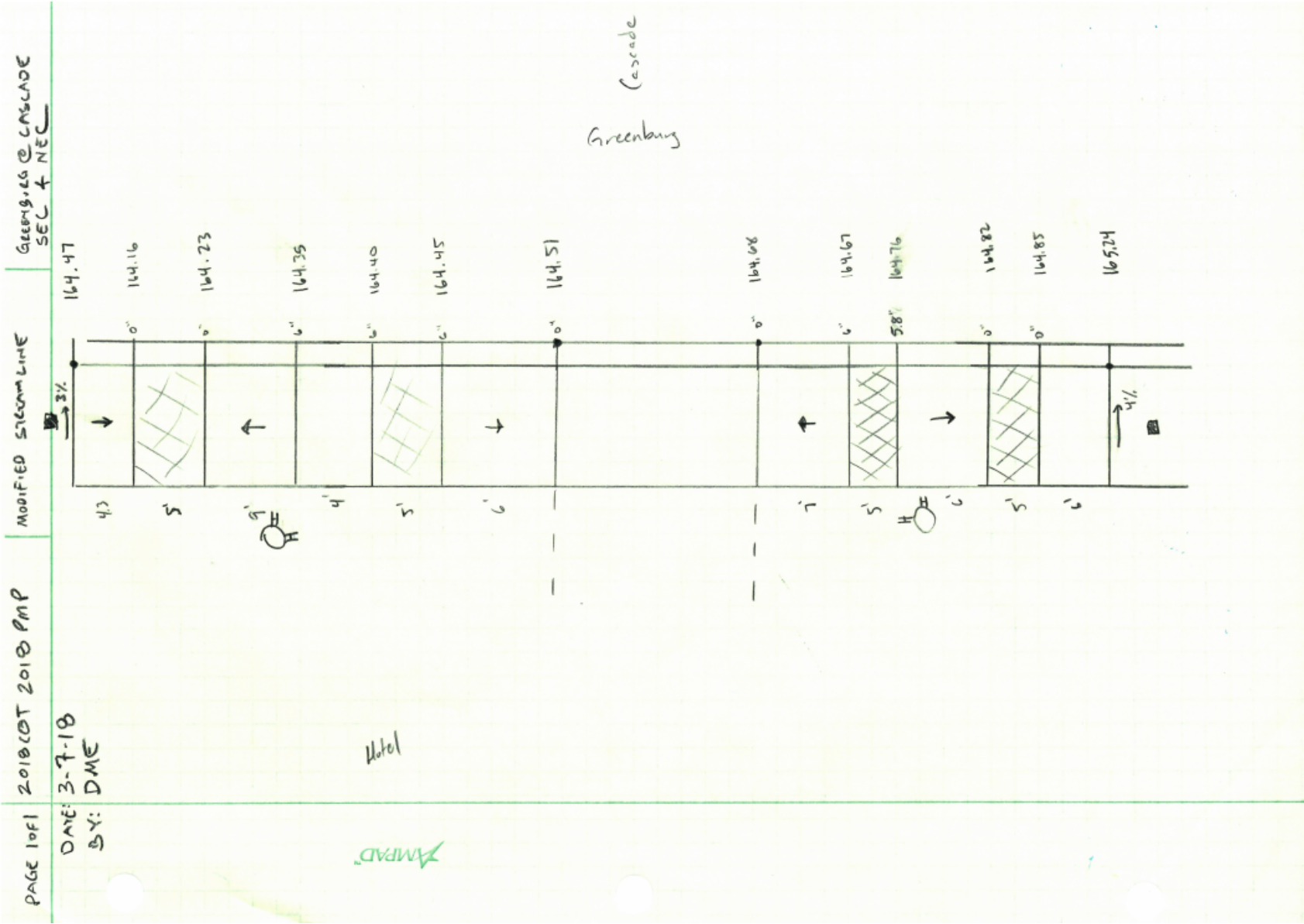


Design Approach – Enhanced Design-Build



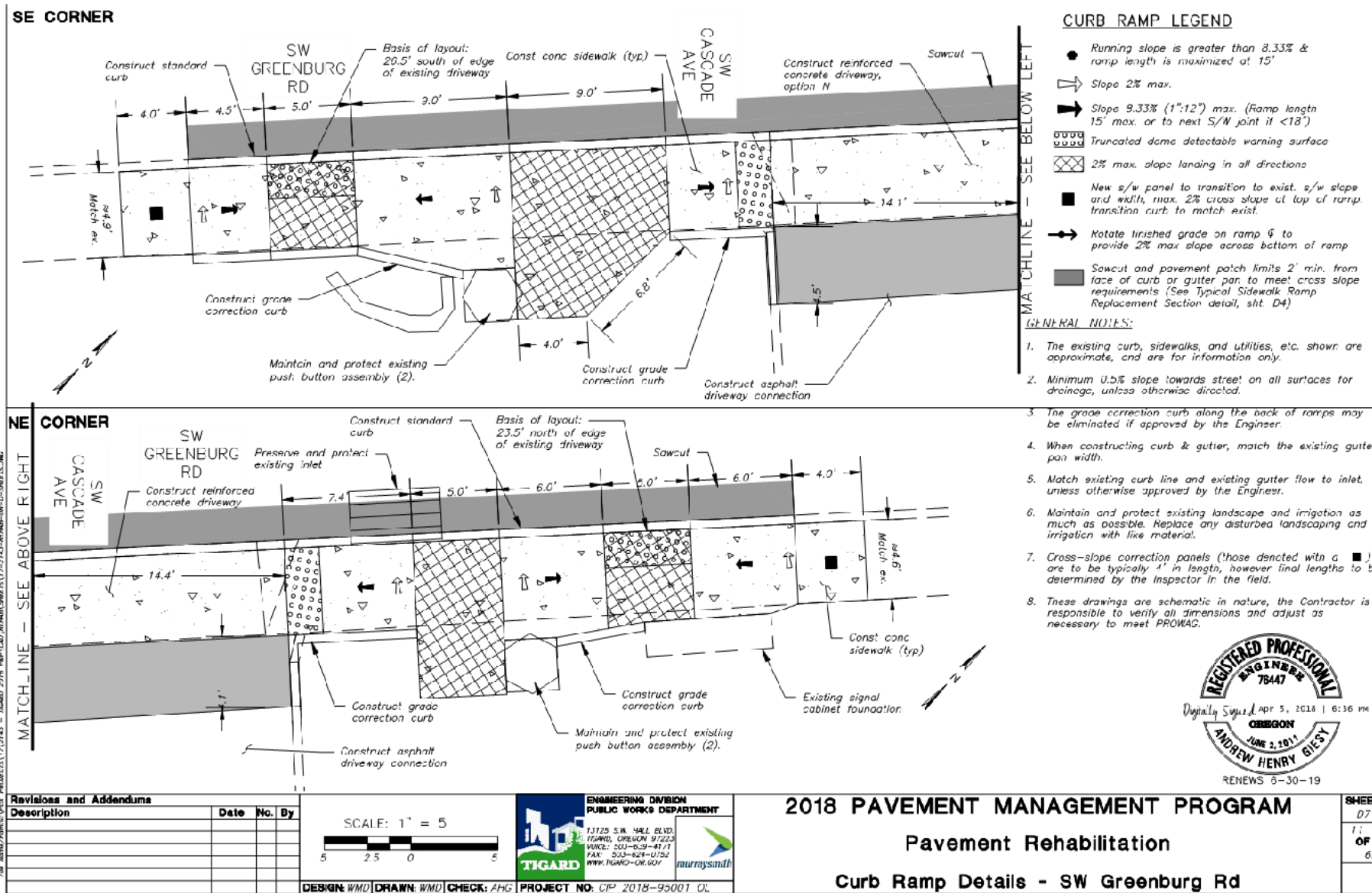


Design Approach – Enhanced Design-Build





Design Approach – Enhanced Design-Build



Design Approach – Enhanced Design-Build



Before



After



Design Approach – Enhanced Design-Build

Takeaways:

- Major known risks addressed during design
- Lower design and construction cost
- Less ability to check designs
- No model or means to perform construction survey
- Usable for new or retrofit cases
- Robust construction oversight still required



Design Approach – Enhanced Design-Build

Agencies using this approach:

- Tigard
- Washington County
- Others?



Design Approach – Design-Build

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



Agencies using this approach:

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

Desktop Review



Untitled Map

Write a description for your map.



- First step after scoping
- Double check locations
- Prepare for field work

Google earth

©2016 Google

3.99 ft

Field measurements



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



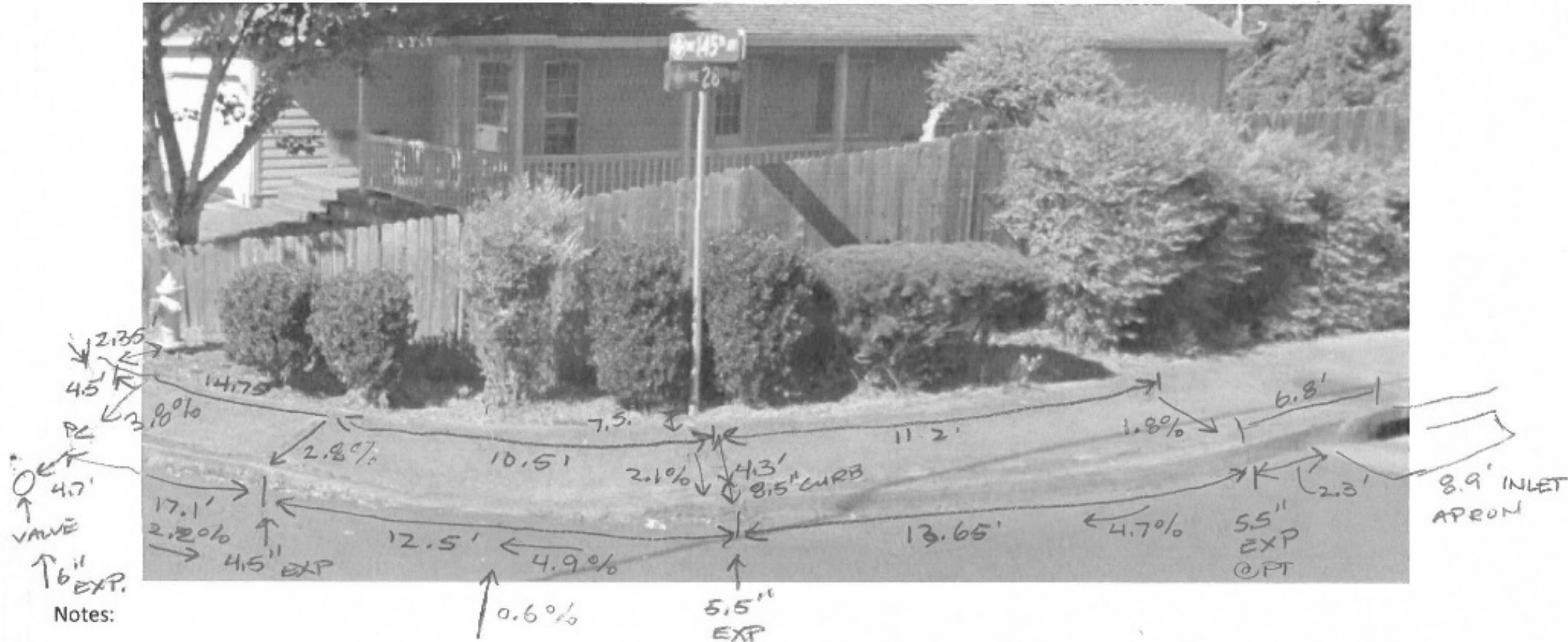
Vancouver, WA

Curb Ramp Evaluation



Date: 12/14/15	Client: City of Vancouver	Project: 2016 Curb Ramp & Street Striping	Data Collected by: RPS/AHG SBB
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002 – NE corner of NE 28th Street & 145th Avenue





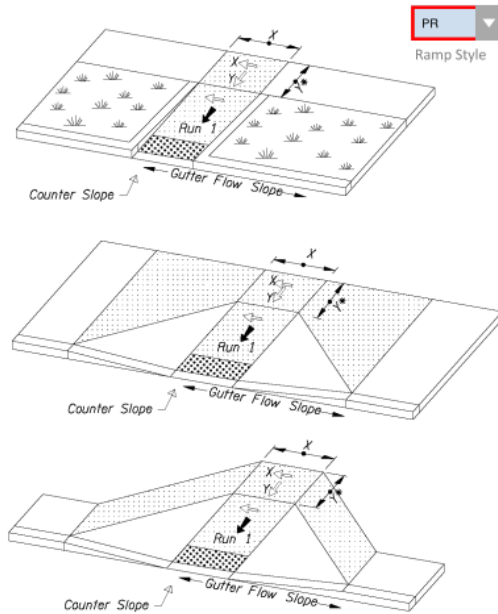
If a ramp meets ADA, document it



ADA Curb Ramp Inspection Form (Perpendicular)

Submit by E-mail

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



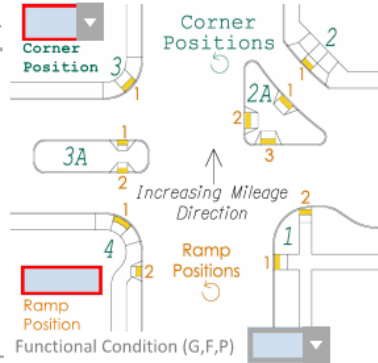
PERPENDICULAR RAMP (PR)

- Pedestrian Access Route (to measure Clear Width)
- Detectable Warning Surface
- Cross Slope (2.0% max.)
- Running Slope (8.3% max.)
- Counter Slope (5.0% max.)
- Turning Space (X & Y) (2.0% max. / 4' x 4' min.)*
* If constrained at back of walk, min. Y length is 5'.
- Gutter Flow Slope (as directed)

PR Ramp Style

Calibration Date _____ (mm/dd/yy)

RAMP RUN 1	Pass	Fail
Running Slope 1	<input type="checkbox"/> ≤ 8.3%	<input type="checkbox"/> > 8.3%
Run 1 Length	<input type="checkbox"/> ≤ 15'	<input type="checkbox"/> > 15'
Cross Slope 1	<input type="checkbox"/> ≤ 2.0%	<input type="checkbox"/> > 2.0%
Detectable Warning	<input type="checkbox"/> (TD, X)	<input type="checkbox"/> (N)
Lip Height	<input type="checkbox"/> ≤ 1/4"	<input type="checkbox"/> > 1/4"
Gutter Flow Slope	<input type="checkbox"/>	<input type="checkbox"/>
Curb Running Slope (avg)	<input type="checkbox"/> ≤ 8.3%	<input type="checkbox"/> > 8.3%
Counter Slope (+/-)	<input type="checkbox"/> ≤ 5.0%	<input type="checkbox"/> > 5.0%
Slope Differential	<input type="checkbox"/>	<input type="checkbox"/>



Where flared sides exist, a 4' wide unobstructed sidewalk is required around the flared sides with cross slope not greater than 2.0%.
If the Running Slope of the sidewalk around the flared sides is more than 5.0%, use a Combination style ramp inspection form.

Good (G) = all applicable boxes on left pass
OR Design Exception addresses criteria that do not 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, alignment, etc.)

TURNING SPACE	Pass	Fail
Width X	<input type="checkbox"/> ≥ 4'*	<input type="checkbox"/> < 4'*
Length Y	<input type="checkbox"/>	<input type="checkbox"/>
Slope X	<input type="checkbox"/> and	<input type="checkbox"/> or
Slope Y	<input type="checkbox"/> ≤ 2.0%	<input type="checkbox"/> > 2.0%

MISCELLANEOUS	Pass	Fail
Clear Width (feet)	<input type="checkbox"/> ≥ 4'	<input type="checkbox"/> < 4'
Physical Condition (G,F,P)	<input type="checkbox"/>	<input type="checkbox"/>
ADA Design Exception (Y,N)	<input type="checkbox"/>	<input type="checkbox"/>
Design Ex. Control Number	<input type="checkbox"/>	<input type="checkbox"/>

Comment:

Inspector's Signature _____ Date (mm/dd/yy) _____

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 (enhanced design-build)
- Develop CAD sketch of ramp
 - Use field sketch measurements
 - Utilize Agency GIS or aerial photo as base
 - Add pertinent notes



Design process – key elements

- Same criteria as other design options
- Design cross slope max to 1.5%
- Design running slope max of 7.5%
- Dimensions
- Slopes
- Transition panels

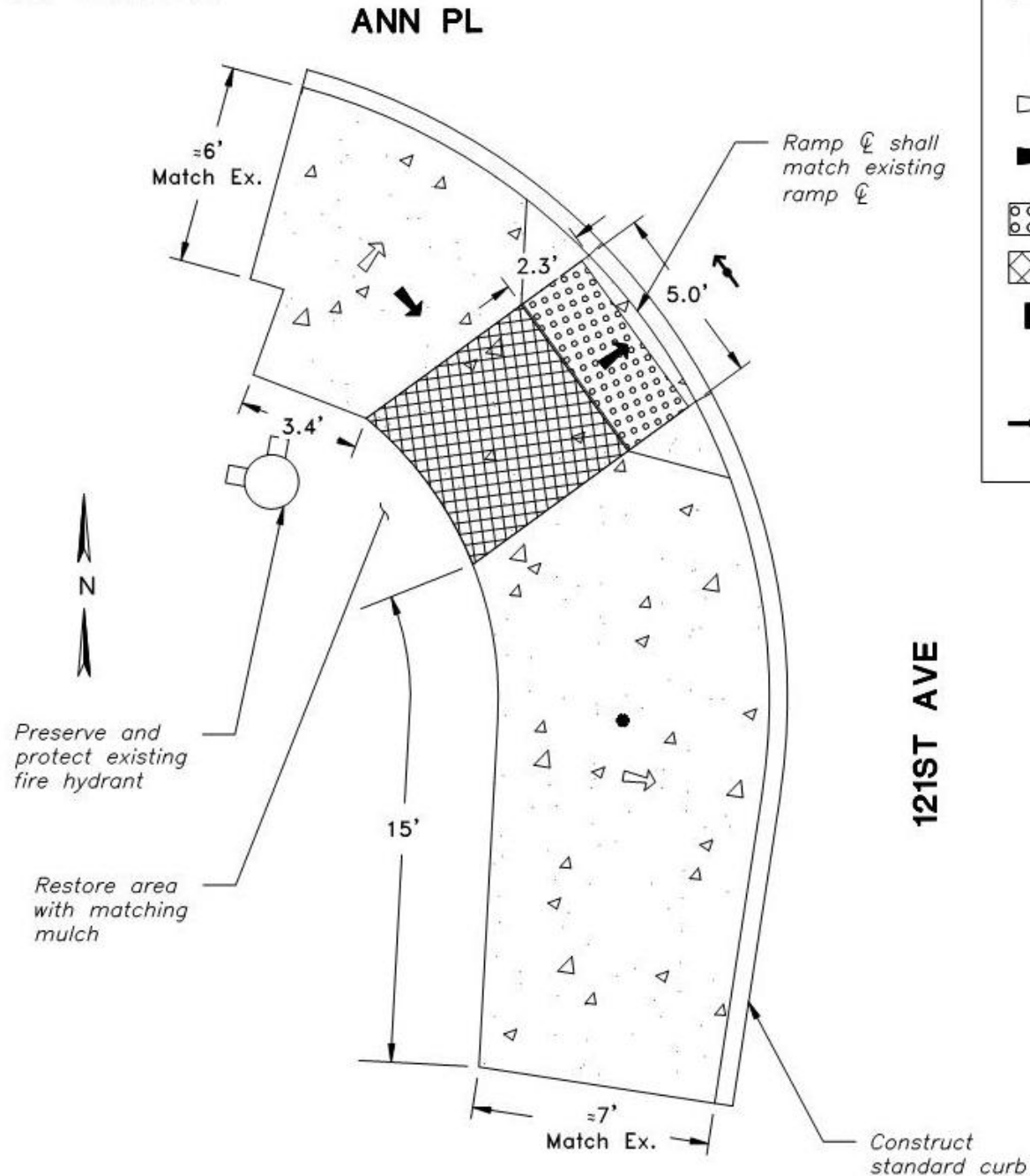


Design process – key elements (cont.)

- Reference point for new ramp
- Grade correction curbs
- Grade and utility adjustments
- Restoration requirements
- **Stay within existing sidewalk limits**



SW CORNER



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

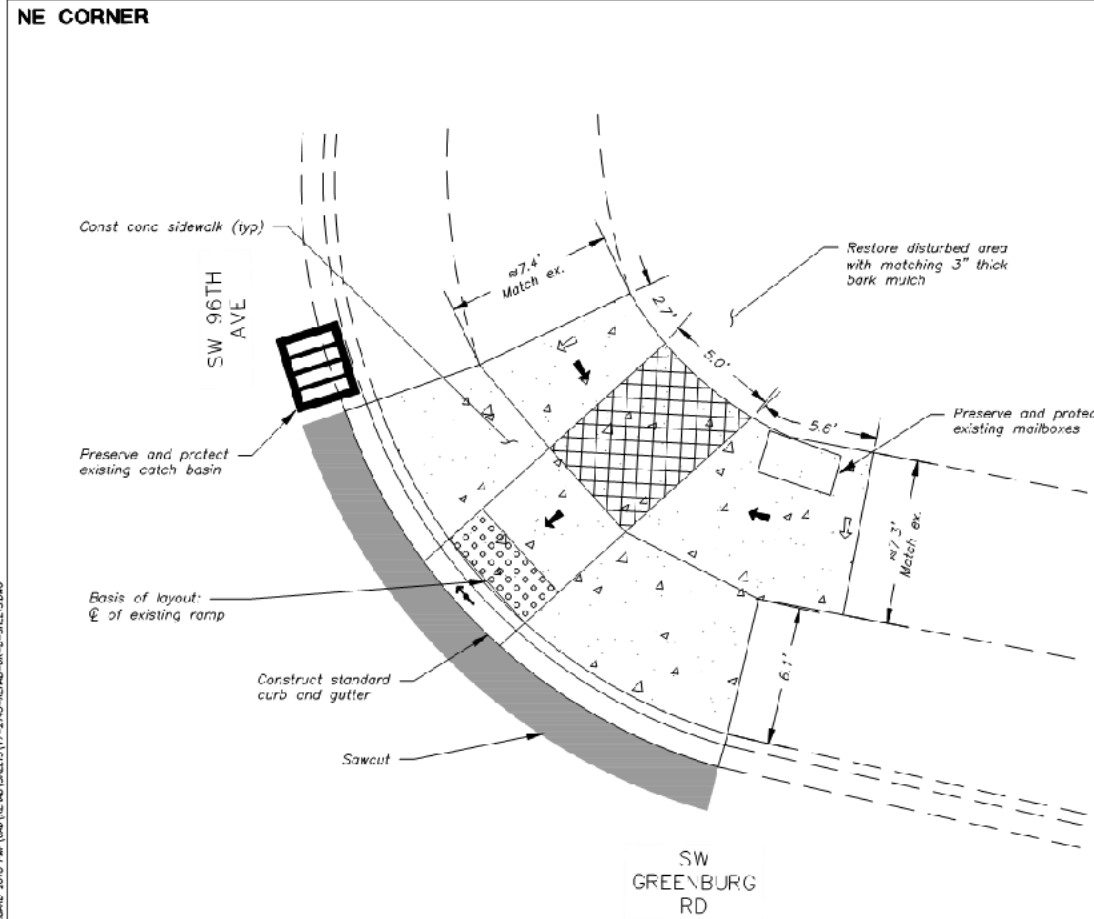
GENERAL NOTES:

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.



Tigard, OR

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CURB RAMP LEGEND

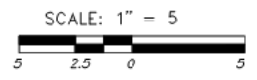
- Running slope is greater than 0.33% & ramp length is maximized at 15'
- ↗ Slope 2% max.
- ➔ Slope 0.33% (1"12") max. (Ramp length 15' max. or to next S/W joint if <18")
- ⬢ Truncated dome detectable warning surface
- ⊠ 2% max. slope landing in all directions
- New s/w panel to transition to exist. s/w slope and width, max. 2% cross slope at top of ramp transition curb to match exist.
- ➔ Rotate finished grade on ramp @ to provide 2% max slope across bottom of ramp
- ▭ Sawcut and pavement patch limits 2' min. from face of curb or gutter pan to meet cross slope requirements (See Typical Sidewalk Ramp Replacement Section detail, sht. D4)

GENERAL NOTES:

1. The existing curb, sidewalks, and utilities, etc shown are approximate, and are for information only.
2. Minimum 0.5% slope towards street on all surfaces for drainage, unless otherwise directed.
3. The grade correction curb along the back of ramps may be eliminated if approved by the Engineer.
4. When constructing curb & gutter, match the existing gutter pan width.
5. Match existing curb line and existing gutter flow to inlet, unless otherwise approved by the Engineer.
6. Maintain and protect existing landscape and irrigation as much as possible. Replace any disturbed landscaping and irrigation with like material.
7. Cross-slope correction panels (those denoted with a ■) are to be typically 4' in length, however final lengths to be determined by the Inspector in the field.
8. These drawings are schematic in nature, the Contractor is responsible to verify all dimensions and adjust as necessary to meet PROWAG.

Plotted by DAW 6/20/18 on Thursday, April 03, 2018 at 3:40:30 PM from file 17-D13 layout.dwg
 File Name: P:\Projects\17-D13\17-D13.dwg - TIGARD 2018 PAV.MXD (REVISED) 17-D13-PAV-MGD-OR-C-18E25.DWG

Revisions and Addendums			
Description	Date	No.	By



ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT

 13125 SW HALL BLVD
 TIGARD, OREGON 97223
 VO: 503-624-4371
 FAX: 503-624-0752
 WWW.TIGARD-OR.GOV

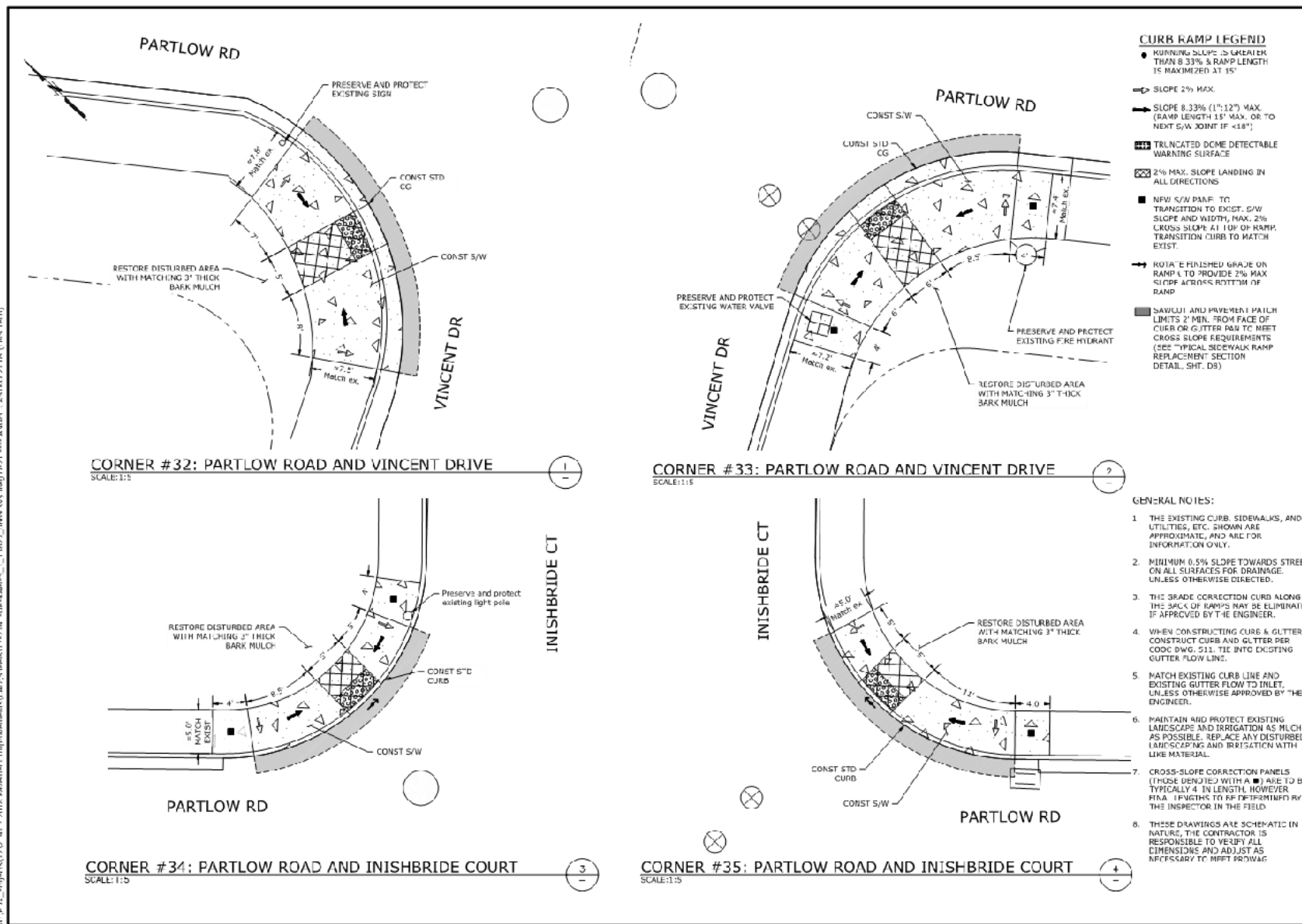
2018 PAVEMENT MANAGEMENT PROGRAM
Pavement Rehabilitation
Curb Ramp Details - SW Greenburg Rd

Digitally Signed: Apr 5, 2018 | 6:56 PM PDT
 RENEWS 6-30-19

SHEET	D13
17	OF
69	

Oregon City, OR

Example Sheet



CURB RAMP LEGEND

- TURNING SLOPE IS GREATER THAN 8.33% & RAMP LENGTH IS MAXIMIZED AT 15'
- SLOPE 2% MAX.
- SLOPE 8.33% (1":12") MAX. (RAMP LENGTH 15' MAX. OR TO NEXT S/W JOINT IF <18")
- ▩ TRUNCATED DOME DETECTABLE WARNING SURFACE
- ▨ 2% MAX. SLOPE LANDING IN ALL DIRECTIONS
- NEW S/W PANEL TO TRANSITION TO EXIST. S/W SLOPE AND WIDTH. MAX. 2% CROSS SLOPE AT 1' UP OF RAMP. TRANSITION CURB TO MATCH EXIST.
- NOT A FINISHED GRADE ON RAMP & TO PROVIDE 2% MAX SLOPE ACROSS BOTTOM OF RAMP
- ▨ SAWDUST AND PREVENTION PAINT LIMITS 2" MIN. FROM FACE OF CURB OR GUTTER PAN TO MEET CROSS SLOPE REQUIREMENTS (SEE TYPICAL SIDEWALK RAMP REPLACEMENT SECTION DETAIL, SHT. D8)

GENERAL NOTES:

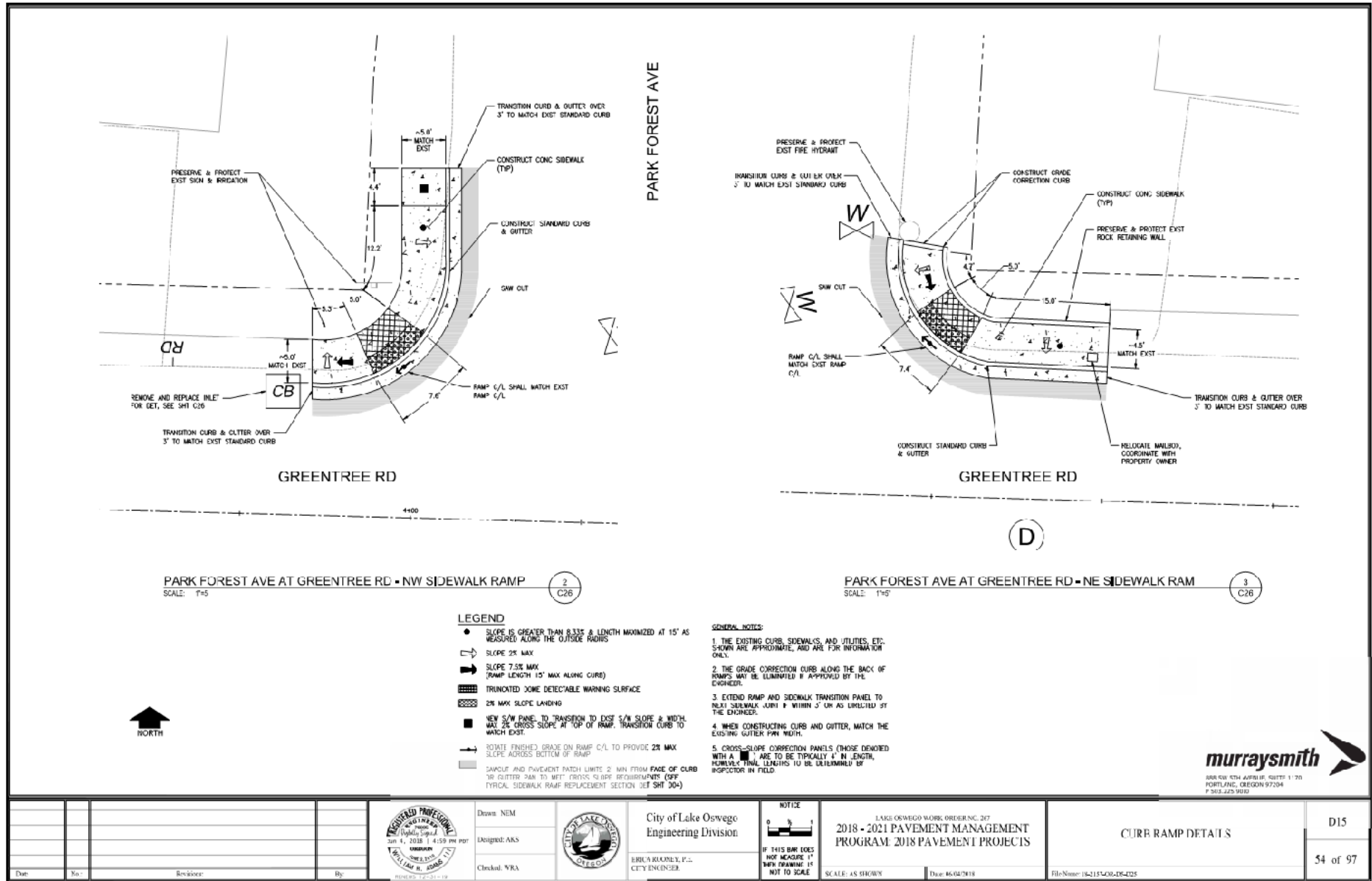
1. THE EXISTING CURB, SIDEWALKS, AND UTILITIES, ETC. SHOWN ARE APPROXIMATE, AND ARE FOR INFORMATION ONLY.
2. MINIMUM 0.5% SLOPE TOWARDS STREET ON ALL SURFACES FOR DRAINAGE. UNLESS OTHERWISE DIRECTED.
3. THE GRADE CORRECTION CURB ALONG THE SLOPE OF RAMP MAY BE ELIMINATED IF APPROVED BY THE ENGINEER.
4. WHEN CONSTRUCTING CURB & GUTTER, CONSTRUCT CURB AND GUTTER PER CODE DWG. 511. THE INTO EXISTING GUTTER FLOW LINE.
5. MATCH EXISTING CURB LINE AND EXISTING GUTTER FLOW TO INLET. UNLESS OTHERWISE APPROVED BY THE ENGINEER.
6. MAINTAIN AND PROTECT EXISTING LANDSCAPE AND IRRIGATION AS MUCH AS POSSIBLE. REPLACE ANY DISTURBED LANDSCAPING AND IRRIGATION WITH LIVE MATERIAL.
7. CROSS-SLOPE CORRECTION PANELS (THOSE DENOTED WITH A ■) ARE TO BE TYPICALLY 4' IN LENGTH, HOWEVER FIRM OFFICIALS TO BE DETERMINED BY THE INSPECTOR IN THE FIELD.
8. THESE DRAWINGS ARE SCHEMATIC IN NATURE. THE CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS AND ADJUST AS NECESSARY TO MEET PROWAG.

SCALE: AS SHOWN NOTICE: FIELD OFFICERS TO VERIFY ALL DIMENSIONS AND ADJUST AS NECESSARY TO MEET PROWAG.	REVISIONS: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>NO.</td><td>DATE</td><td>DESCRIPTION</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	NO.	DATE	DESCRIPTION							PROJECT NO.: 2018-001 SHEET NO.: 25 OF 31 DATE: APRIL 2018	SUBJECT: RAMP DETAILS PROJECT: 2018 OREGON CITY ROADWAY RECONSTRUCTION PROJECT NO. CI 18-001
NO.	DATE	DESCRIPTION										

G:\P\2018\2018 Oregon City Improvement\2018\Sheet\18-001-04-01-001-001.dwg (18-001) - AMER - 25/04/2018 10:00 AM



Lake Oswego, OR

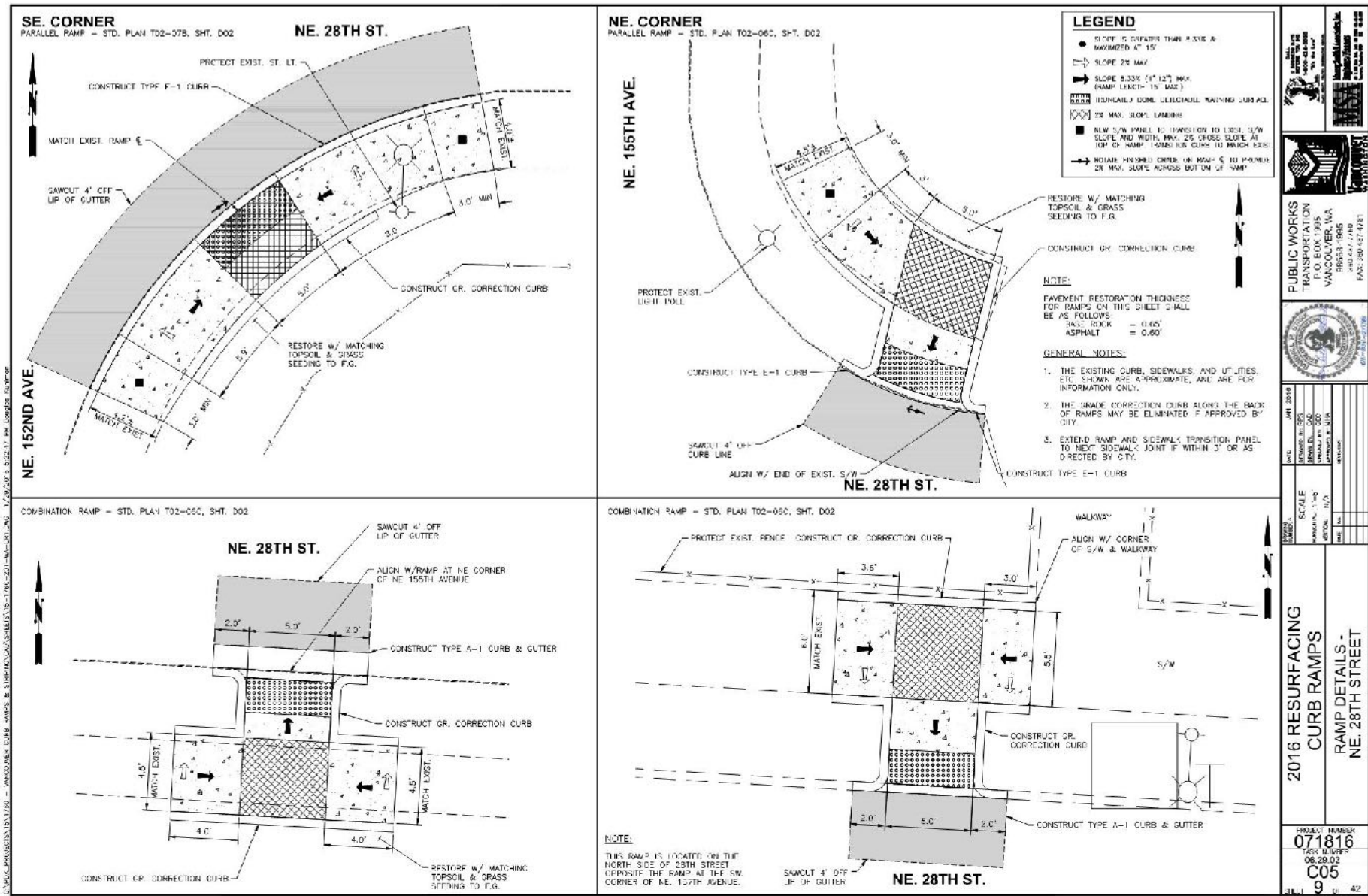


888 SW 4TH AVENUE, SUITE 1170
PORTLAND, OREGON 97204
P.503.225.9000

Vancouver, WA



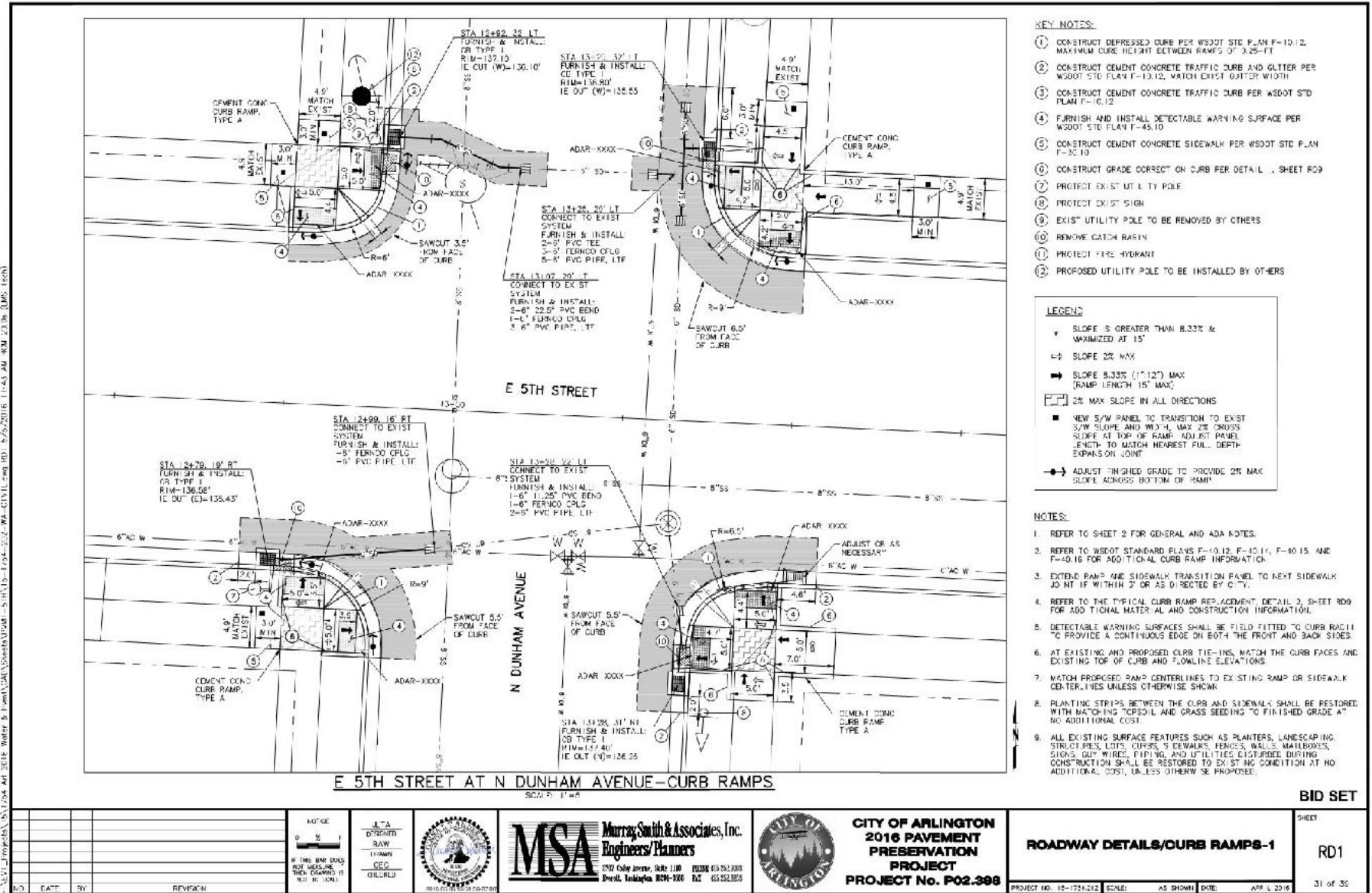
Example Sheet

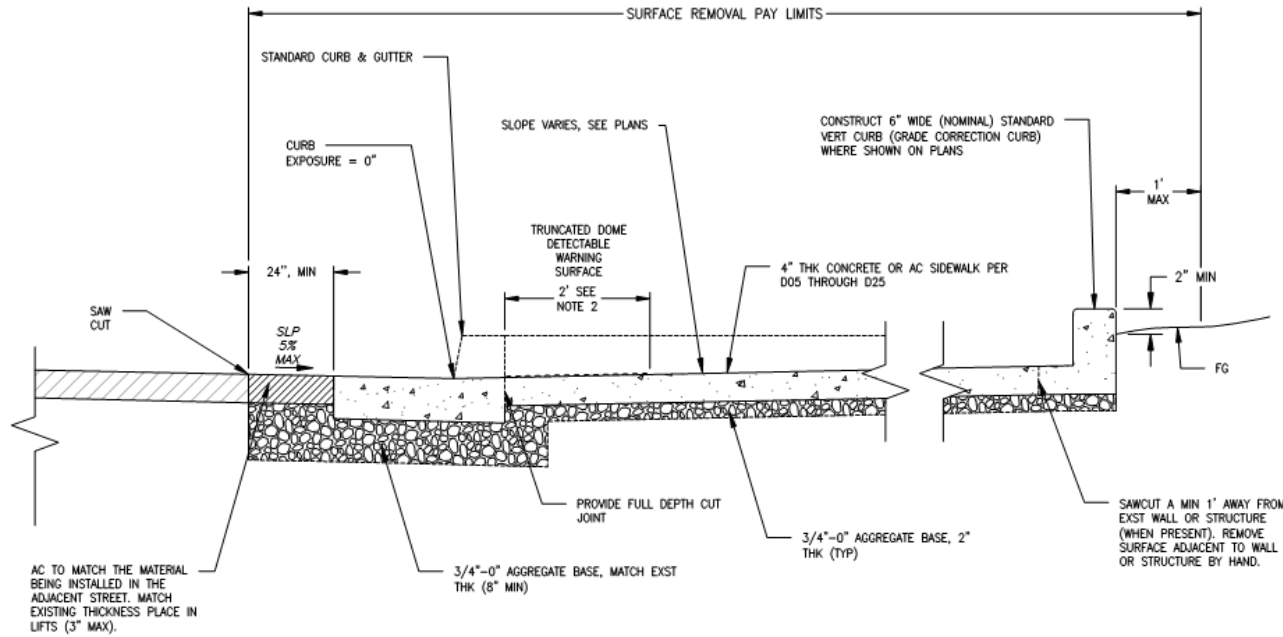


Arlington, WA- 2016



Example Sheet





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.
4. ADJUST SAW CUT LIMITS AS NECESSARY TO MAINTAIN A MAX 5% COUNTERSLOPE AT THE RAMP THROAT.

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 CITY OF LAKE OSWEGO STANDARD DRAWINGS S2-01, S2-02, S3-01, AND OREGON STANDARD DRAWINGS RD720, RD754, 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. 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 OR DIVERSION 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. 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.
8. 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.



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Date		No.	Revisions	By:		Drawn: NEM Designed: AKS Checked: WRA		City of Lake Oswego Engineering Division ERICA ROONEY, P.E. CITY ENGINEER	NOTICE <p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE</p>	LAKE OSWEGO WORK ORDER NO. 207 2018 - 2021 PAVEMENT MANAGEMENT PROGRAM: 2018 PAVEMENT PROJECTS	SCALE: AS SHOWN Date: 06/04/2018	CURB RAMP DETAILS File Name: 16215\01621404	D04 43 of 97
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Construction requirements

- 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









Takeaways:



- Major known risks addressed during design
- Least design and construction cost
- Less ability to check designs
- No model or means to perform construction survey
- Usable ONLY for retrofit cases
- Robust construction oversight still required





Questions?

