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09_08/2019

TIP PROJECT: I-5999

CONTRACT: C204656

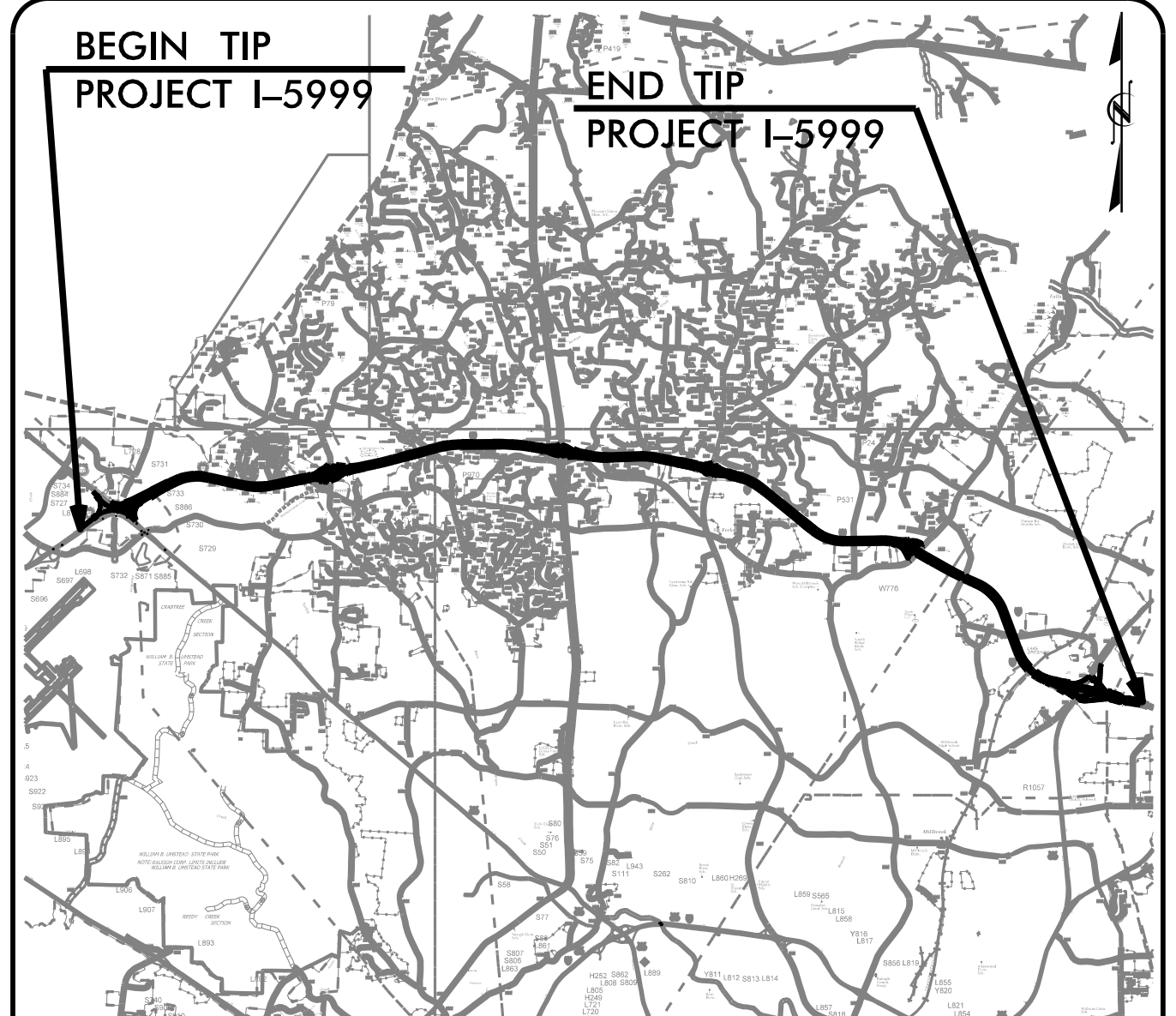
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: I-5999 - I-540 FROM US 70 (GLENWOOD AVE.) TO EAST OF TRIANGLE TOWN CENTER BLVD.

TYPE OF WORK: PAVEMENT REHABILITATION, SIGNING AND ITS

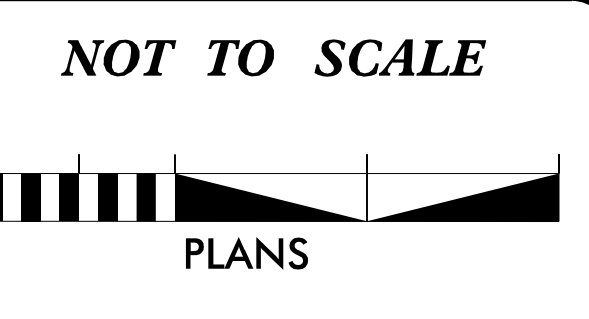
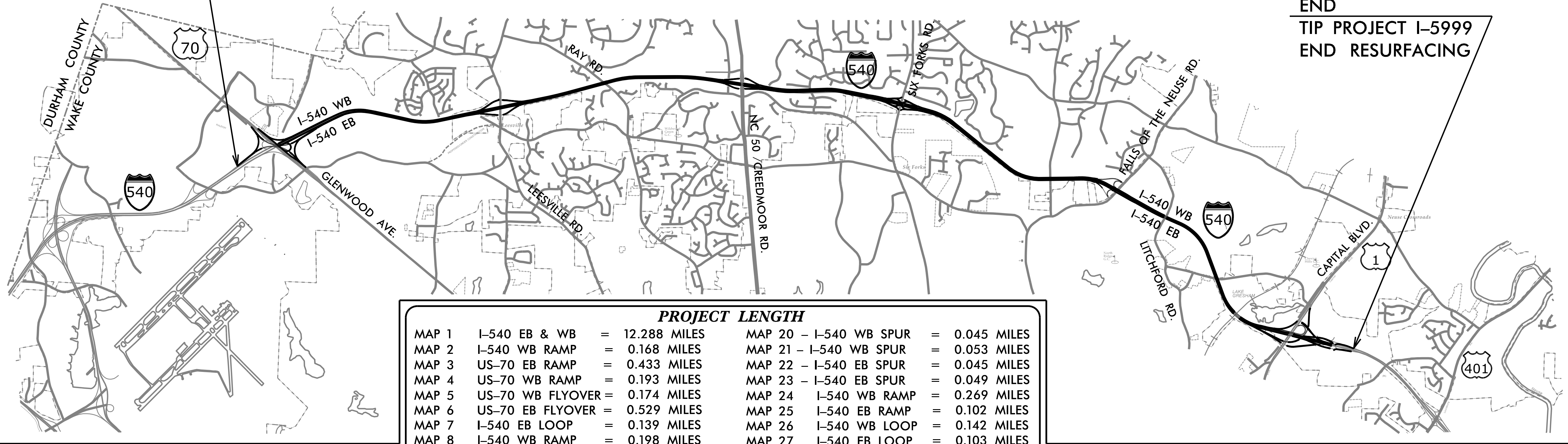
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5999	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47954.1.1	0540046	PE	
47954.3.1	0540046	CONST.	



VICINITY MAP

BEGIN TIP PROJECT I-5999
BEGIN RESURFACING

END TIP PROJECT I-5999
END RESURFACING



DESIGN DATA

2019 AADT = 101,000
T = 18%
FUNC CLASS = INTERSTATE

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2 - 7	RESURFACING MAPS
8	ADA MAP
9 - 14	TYPICAL SECTIONS AND DETAILS
15 - 18	SUMMARY OF QUANTITIES
19	SIGNAL LOOP DETAIL

PROJECT LENGTH

MAP 1	I-540 EB & WB	= 12.288 MILES	MAP 20	- I-540 WB SPUR	= 0.045 MILES
MAP 2	I-540 WB RAMP	= 0.168 MILES	MAP 21	- I-540 WB SPUR	= 0.053 MILES
MAP 3	US-70 EB RAMP	= 0.433 MILES	MAP 22	- I-540 EB SPUR	= 0.045 MILES
MAP 4	US-70 WB RAMP	= 0.193 MILES	MAP 23	- I-540 EB SPUR	= 0.049 MILES
MAP 5	US-70 WB FLYOVER	= 0.174 MILES	MAP 24	I-540 WB RAMP	= 0.269 MILES
MAP 6	US-70 EB FLYOVER	= 0.529 MILES	MAP 25	I-540 EB RAMP	= 0.102 MILES
MAP 7	I-540 EB LOOP	= 0.139 MILES	MAP 26	I-540 WB LOOP	= 0.142 MILES
MAP 8	I-540 WB RAMP	= 0.198 MILES	MAP 27	I-540 EB LOOP	= 0.103 MILES
MAP 9	I-540 WB RAMP	= 0.228 MILES	MAP 28	I-540 WB RAMP	= 0.277 MILES
MAP 10	I-540 EB RAMP	= 0.196 MILES	MAP 29	US 1 NB LOOP	= 0.427 MILES
MAP 11	I-540 EB RAMP	= 0.206 MILES	MAP 30	US 1 SB RAMP	= 0.275 MILES
MAP 12	I-540 WB RAMP	= 0.199 MILES	MAP 31	I-540 EB SPUR	= 0.101 MILES
MAP 13	I-540 WB RAMP	= 0.168 MILES	MAP 32	I-540 EB RAMP	= 0.360 MILES
MAP 14	I-540 EB RAMP	= 0.174 MILES	MAP 33	I-540 EB FLYOVER	= 0.659 MILES
MAP 15	I-540 EB RAMP	= 0.161 MILES	MAP 34	I-540 WB RAMP	= 0.213 MILES
MAP 16	I-540 WB RAMP	= 0.154 MILES	MAP 35	I-540 WB RAMP	= 0.311 MILES
MAP 17	I-540 WB RAMP	= 0.170 MILES	MAP 36	I-540 EB RAMP	= 0.254 MILES
MAP 18	I-540 EB RAMP	= 0.173 MILES	MAP 37	I-540 EB RAMP	= 0.196 MILES
MAP 19	I-540 EB RAMP	= 0.196 MILES	MAP 38	US-70 WB CD	= 0.662 MILES

LENGTH OF ROADWAY TIP PROJECT I-5999 = 12.288 MILES
TOTAL LENGTH TIP PROJECT I-5999 = 12.288 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

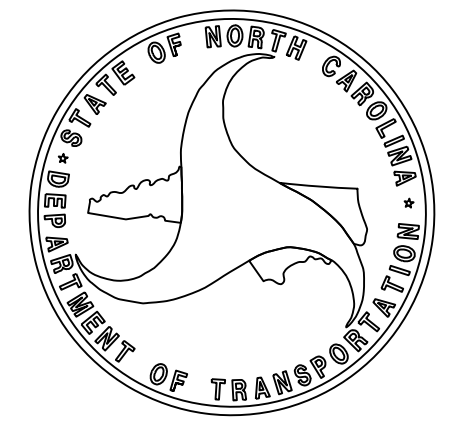
RIGHT OF WAY DATE:
N/A

LETTING DATE:
DECEMBER 20, 2022

TRACY N. PARROTT, PE
DIVISION PROJECT DELIVERY ENGINEER

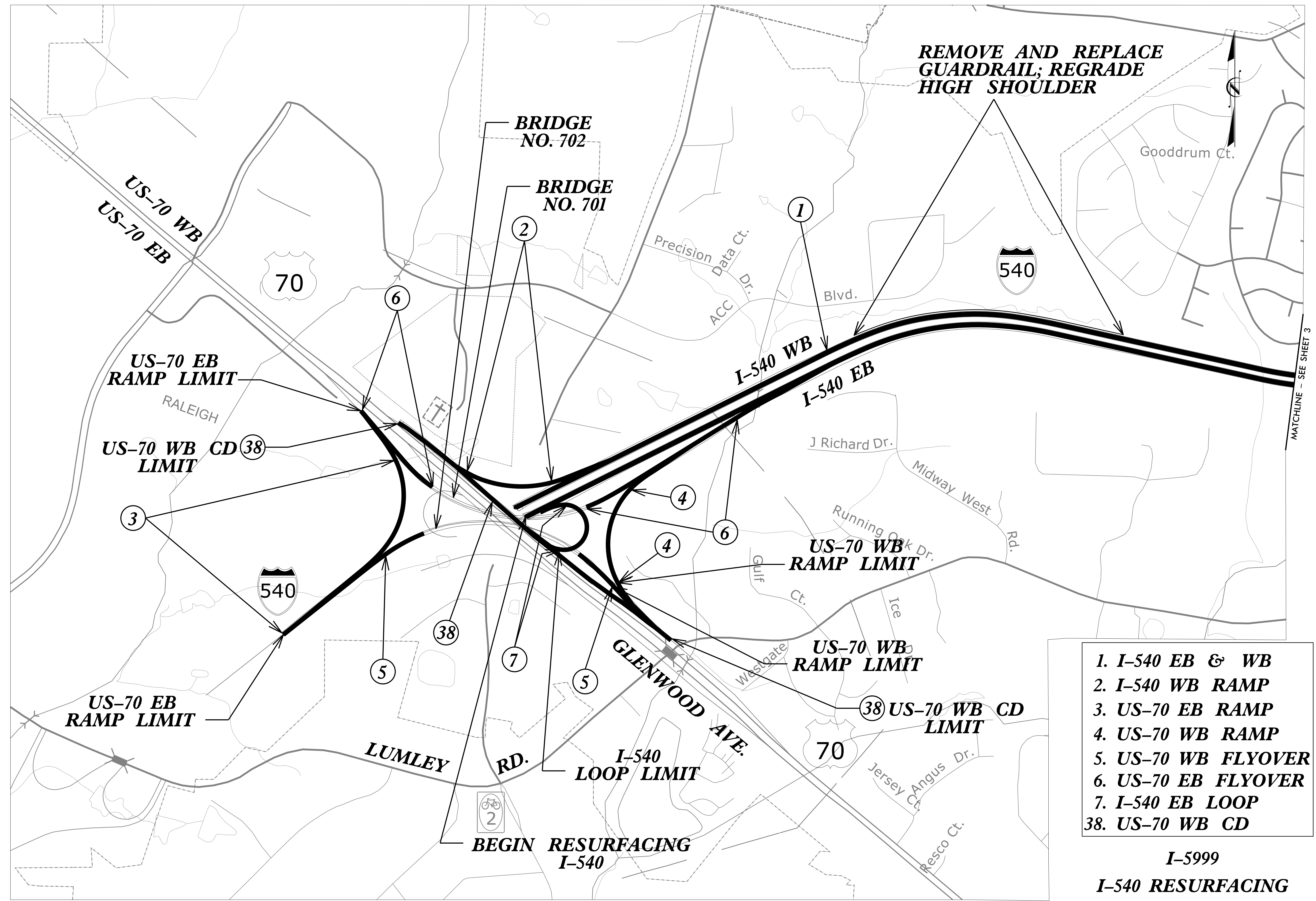
R.K. MURPHY, JR., PE
PROJECT ENGINEER

SCOTT L. KENNEDY
PROJECT DESIGN ENGINEER



9/8/2022
I:\Projects\I-5999_Rdy_TSH_01.dgn
USER:SKENNEDY

8/17/99
 REVISIONS
 9/8/2022
 I:\PROJECTS\I-5999_Rdy_TSH_02.dgn
 USER:SKENNEDY



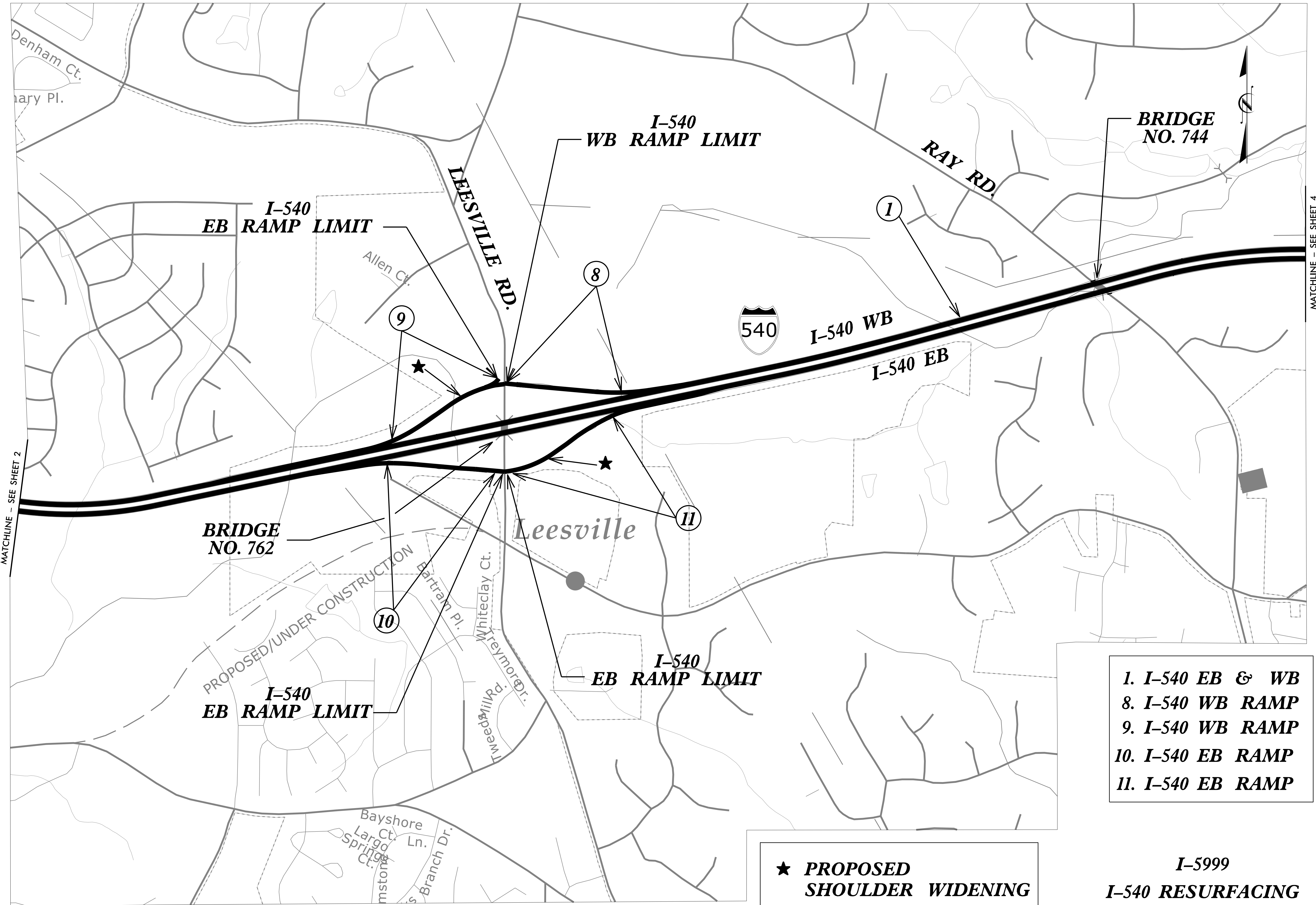
**REMOVE AND REPLACE
GUARDRAIL; REGRADE
HIGH SHOULDER**

- 1. I-540 EB & WB
- 2. I-540 WB RAMP
- 3. US-70 EB RAMP
- 4. US-70 WB RAMP
- 5. US-70 WB FLYOVER
- 6. US-70 EB FLYOVER
- 7. I-540 EB LOOP
- 38. US-70 WB CD

**I-5999
I-540 RESURFACING**

8/17/99

11/18/2021
I:\Projects\1-5999_Rdy_TSH_03.dgn
JSE



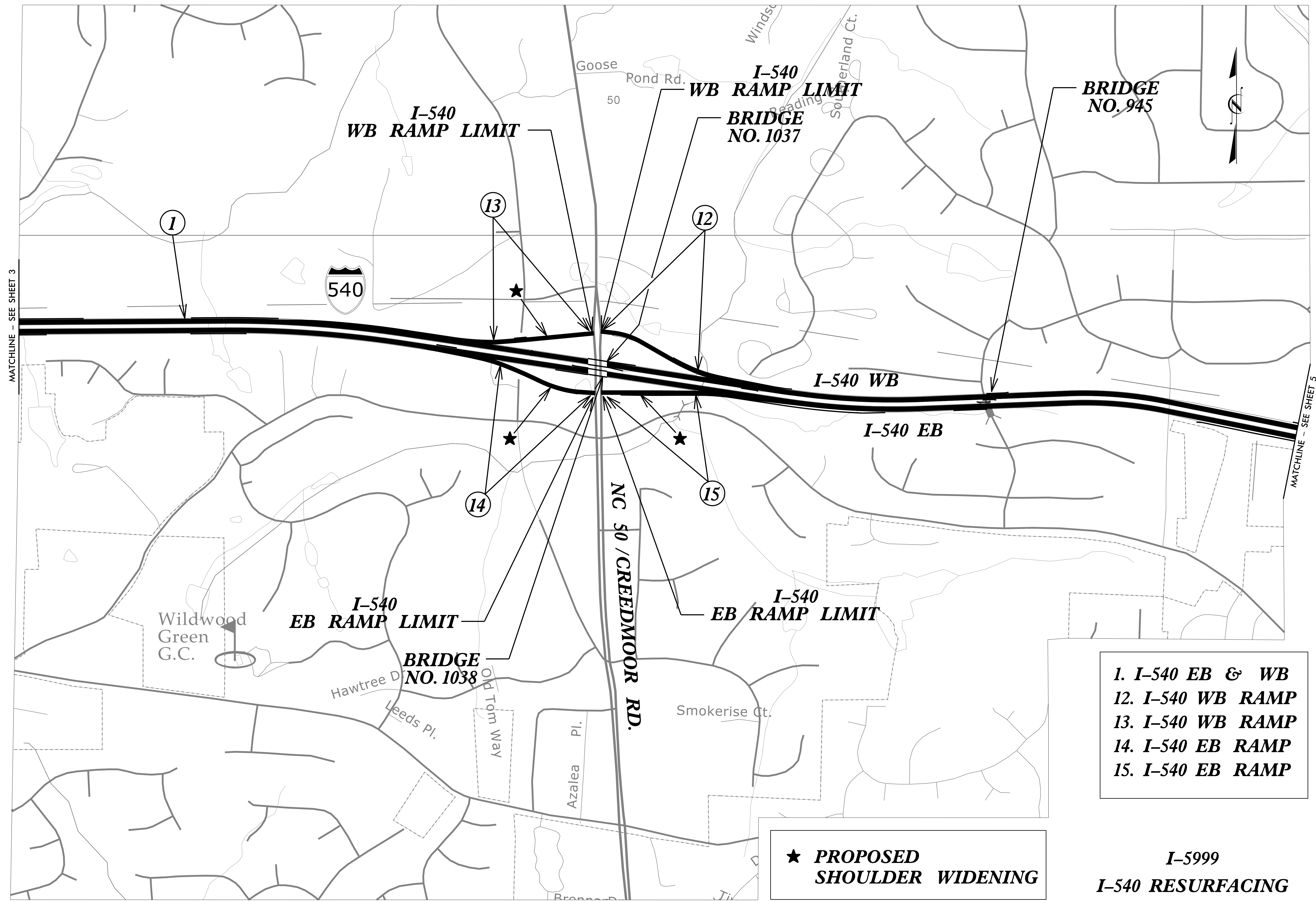
MATCHLINE - SEE SHEET 2

MATCHLINE - SEE SHEET 4

- 1. I-540 EB & WB
- 8. I-540 WB RAMP
- 9. I-540 WB RAMP
- 10. I-540 EB RAMP
- 11. I-540 EB RAMP

★ PROPOSED SHOULDER WIDENING

I-5999
I-540 RESURFACING



- 1. I-540 EB & WB
- 12. I-540 WB RAMP
- 13. I-540 WB RAMP
- 14. I-540 EB RAMP
- 15. I-540 EB RAMP

★ PROPOSED SHOULDER WIDENING

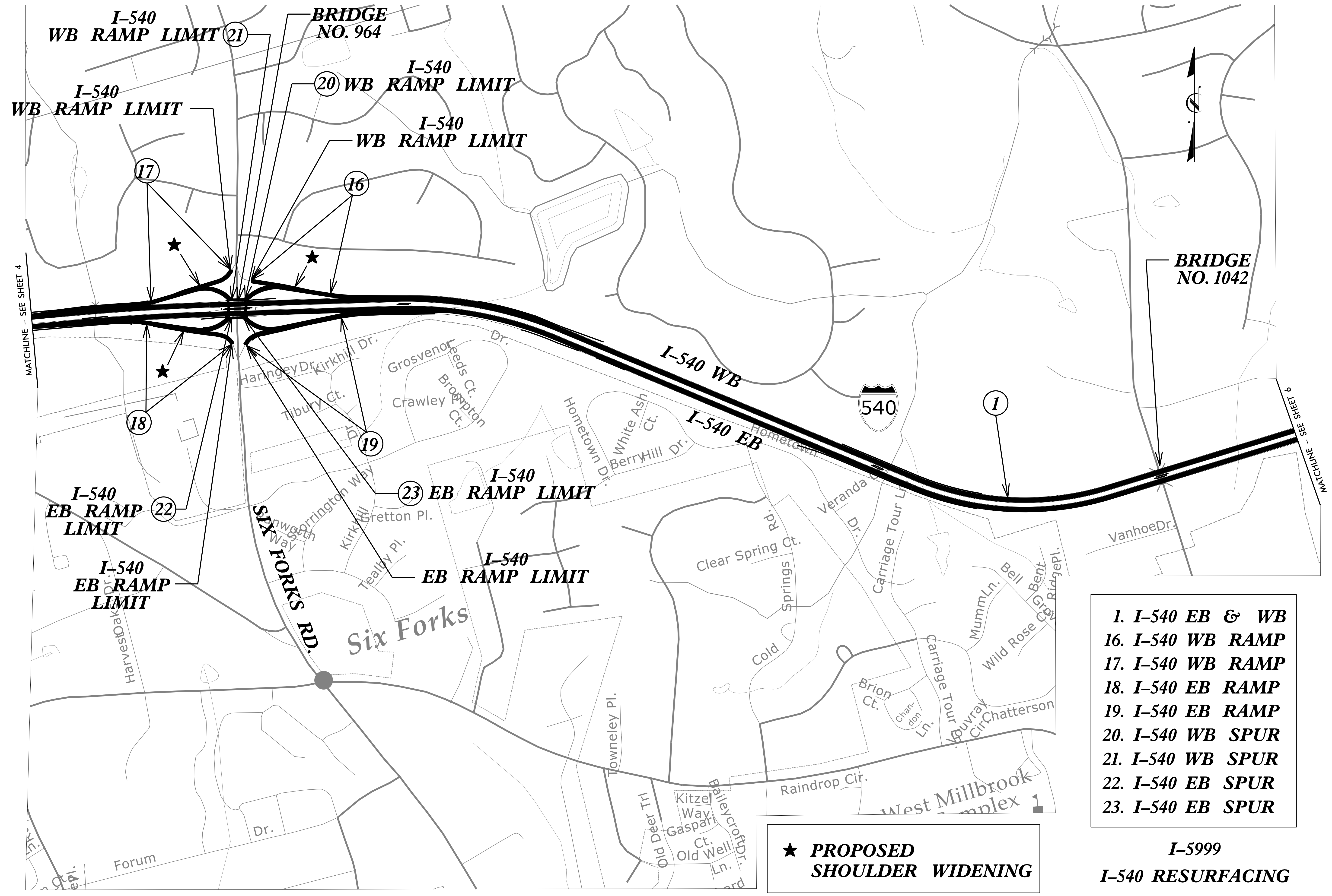
I-5999
I-540 RESURFACING

8/17/99

11/18/2021 11/18/2021
I:\Projects\I-5999\I-540\TSH_04.dgn
US:EF:kenedj

MATCHLINE - SEE SHEET 3

MATCHLINE - SEE SHEET 5



MATCHLINE - SEE SHEET 4

MATCHLINE - SEE SHEET 6

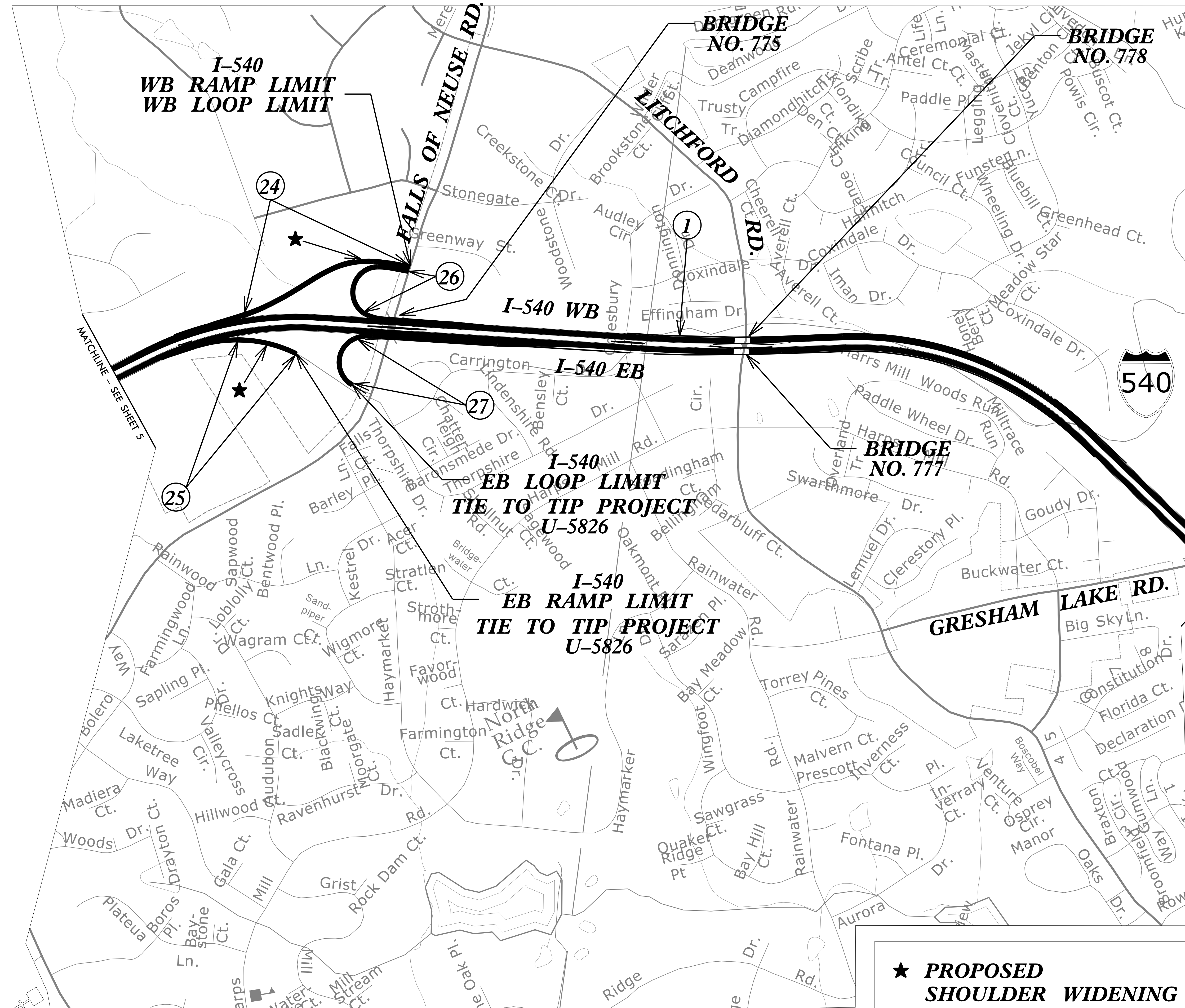
- 1. I-540 EB & WB
- 16. I-540 WB RAMP
- 17. I-540 WB RAMP
- 18. I-540 EB RAMP
- 19. I-540 EB RAMP
- 20. I-540 WB SPUR
- 21. I-540 WB SPUR
- 22. I-540 EB SPUR
- 23. I-540 EB SPUR

★ PROPOSED SHOULDER WIDENING

**I-5999
I-540 RESURFACING**

8/17/99
11/18/2021
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 11/18/2021
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 User: jkennedy



**I-540
 WB RAMP LIMIT
 WB LOOP LIMIT**

FALLS OF NEUSE RD.

I-540 WB

I-540 EB

**I-540
 EB LOOP LIMIT
 TIE TO TIP PROJECT
 U-5826**

**I-540
 EB RAMP LIMIT
 TIE TO TIP PROJECT
 U-5826**

**BRIDGE
 NO. 775**

**LEITCHFORD
 RD.**

**BRIDGE
 NO. 778**

**BRIDGE
 NO. 780**

540

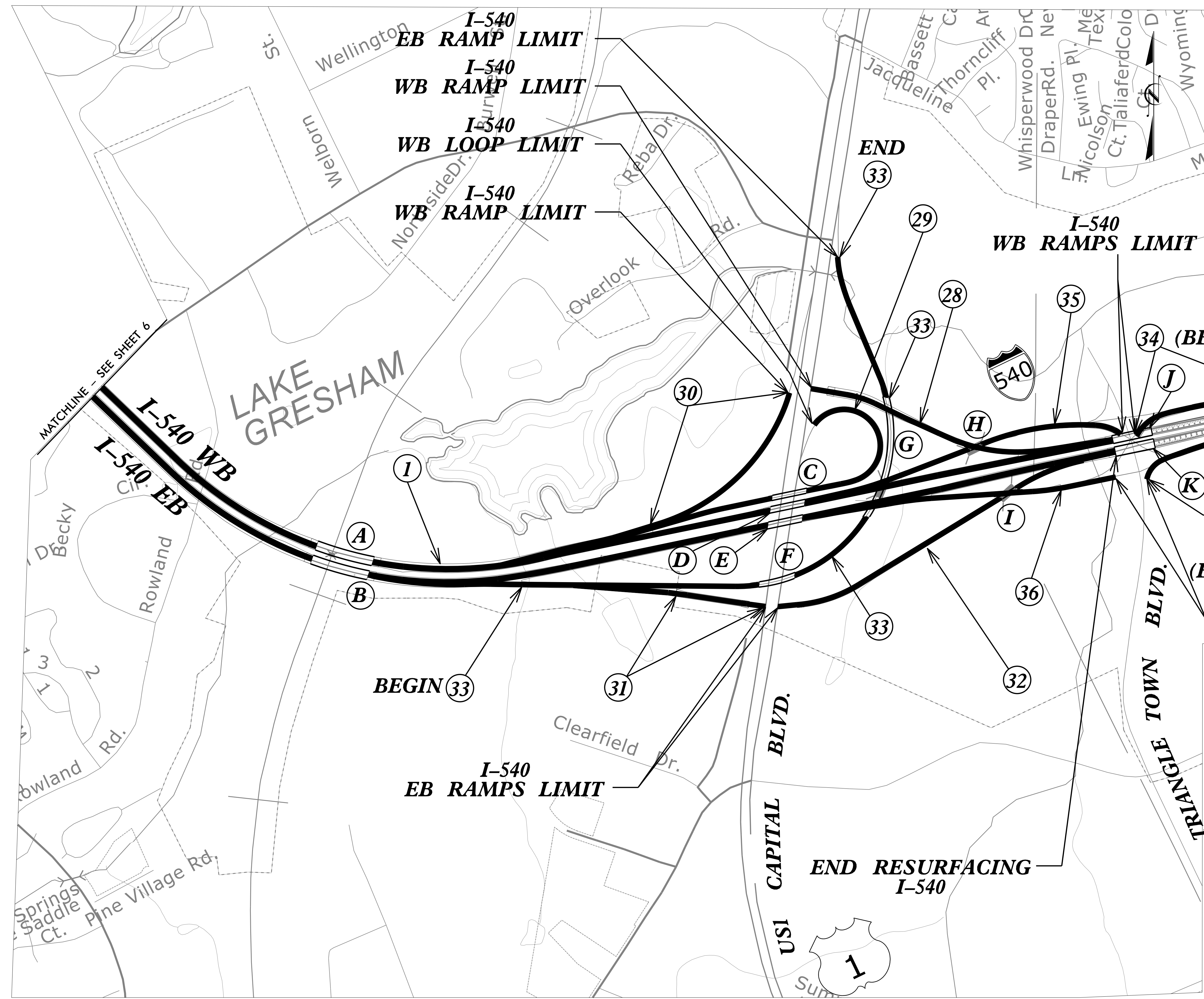
**BRIDGE
 NO. 777**

GRESHAM LAKE RD.

- 1. I-540 EB & WB
- 24. I-540 WB RAMP
- 25. I-540 EB RAMP
- 26. I-540 WB LOOP
- 27. I-540 EB LOOP

**★ PROPOSED
 SHOULDER WIDENING**

**I-5999
 I-540 RESURFACING**



BRIDGE NO.

(A) - 997	(G) - 1005
(B) - 998	(H) - 1006
(C) - 1003	(I) - 1007
(D) - 999	(J) - 1001
(E) - 1000	(K) - 1002
(F) - 1004	

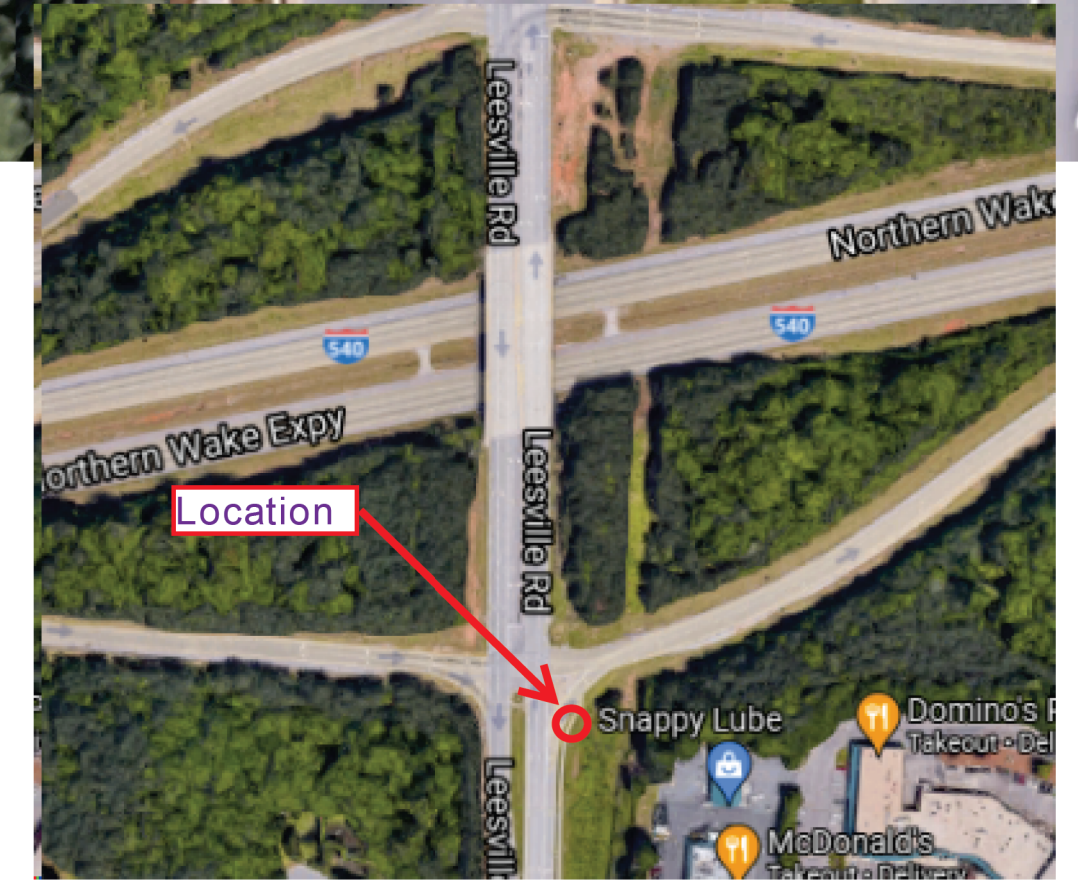
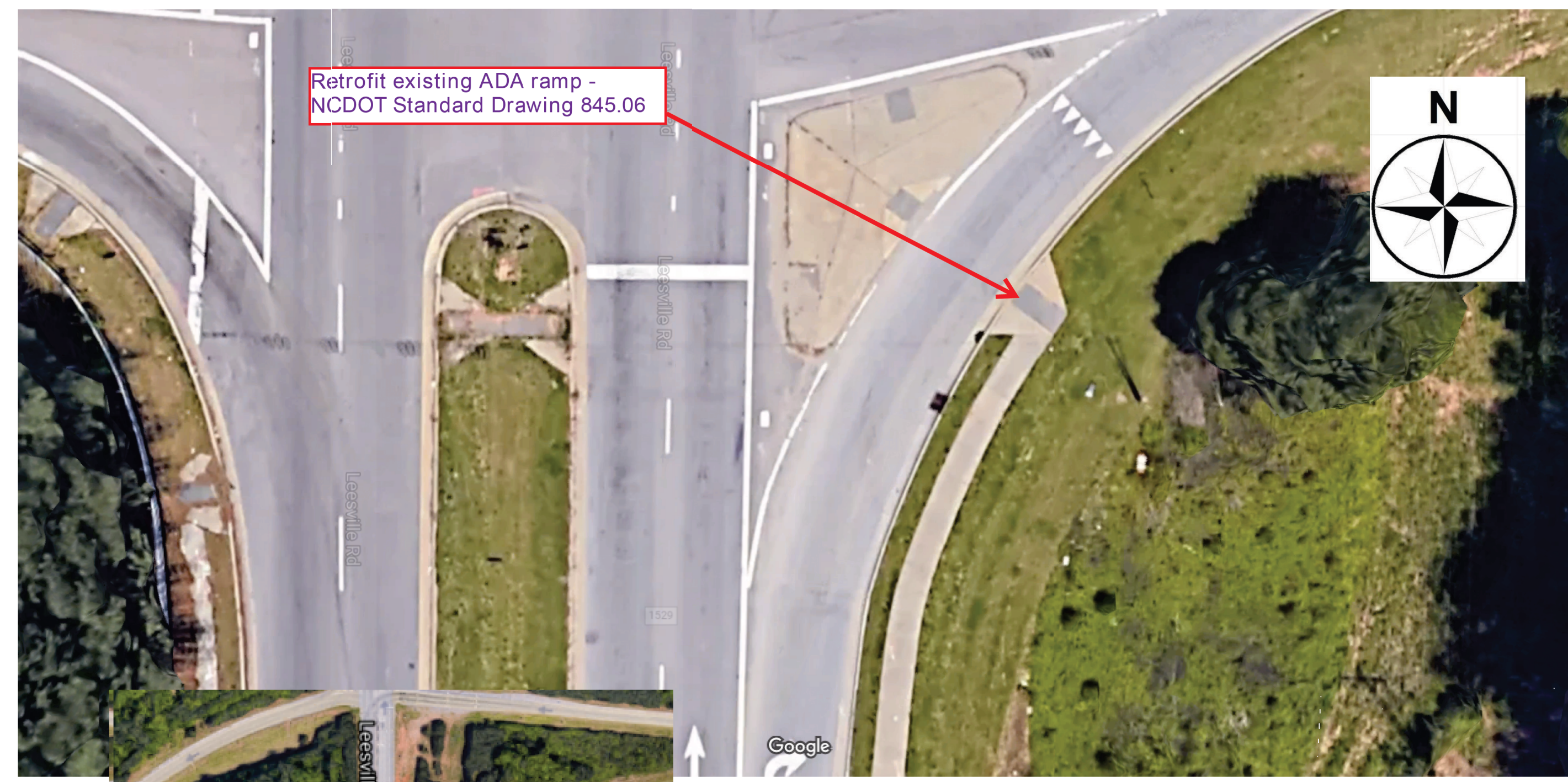
1. I-540 EB & WB
28. I-540 WB RAMP
29. US 1 NB LOOP
30. US 1 SB RAMP
31. I-540 EB SPUR
32. I-540 EB RAMP
33. I-540 EB FLYOVER
34. I-540 WB RAMP
35. I-540 WB RAMP
36. I-540 EB RAMP
37. I-540 EB RAMP

I-5999
I-540 RESURFACING

8/17/99
9/8/2022
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8/17/99

Google Maps



**RETROFIT CURB RAMP AT
LEESVILLE RD. AND RAMP MAP 11**

**I-5999
I-540 RESURFACING**

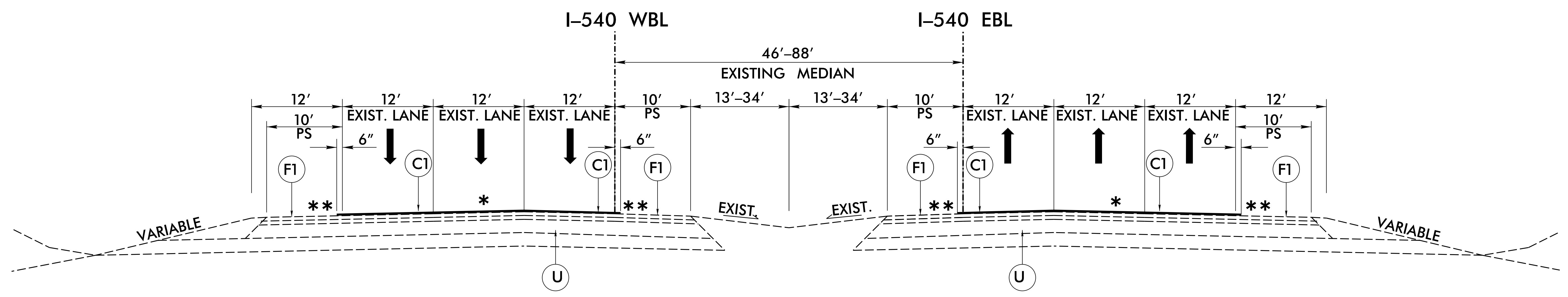
10/4/2021
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JSE

PAVEMENT SCHEDULE

C1	5/8" ULTRA-THIN BONDED WEARING COURSE AT A RATE OF 70 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
E1	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
F1	ASPHALT SURFACE TREATMENT, FOG SEAL
V1	MILL 2.0" OF EXISTING ASPHALT PAVEMENT
U	EXISTING PAVEMENT

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

REVISIONS



- * MATCH EXISTING CROSS SLOPES
- ** RETAIN EXISTING MILLED RUMBLE STRIPS

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

MAP 1 I-540 EBL
MAP 1 I-540 WBL

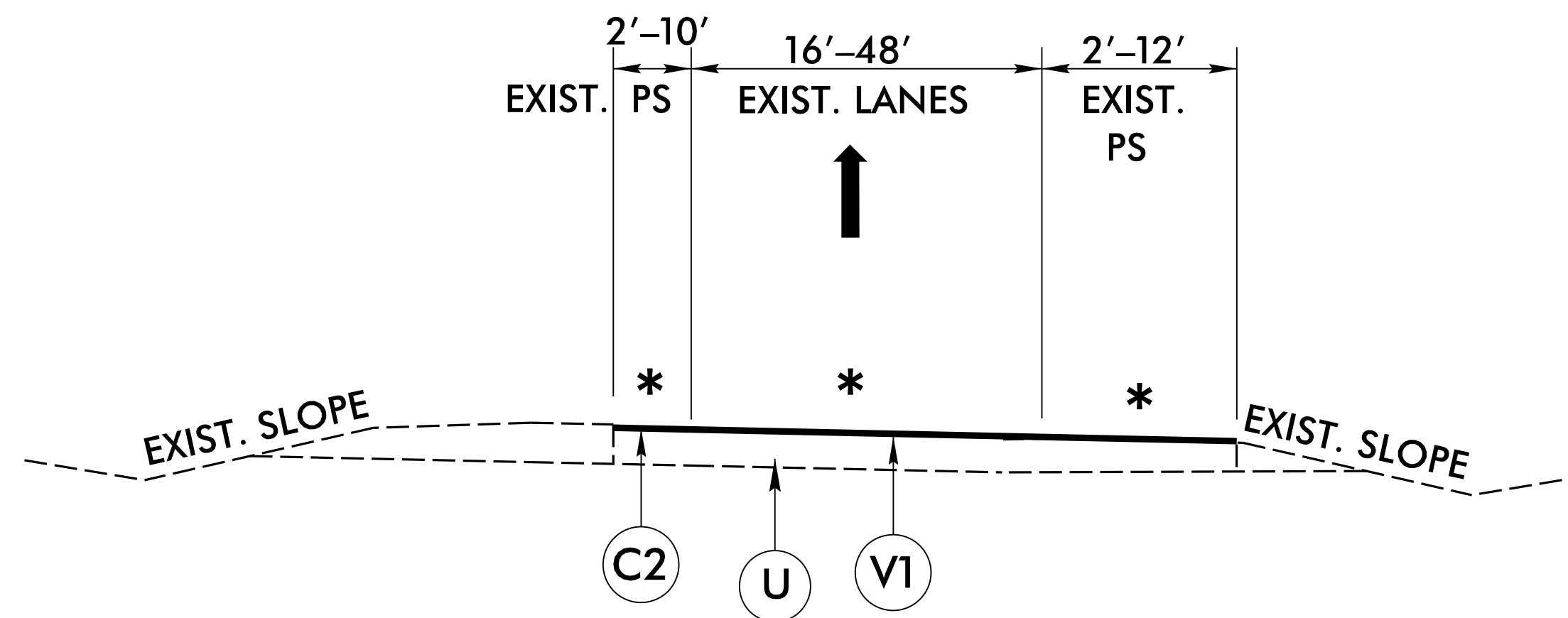
NOTE: MAP 1 I-540 EBL AND WBL
SEAL ALL PAVEMENT CRACKS ON ALL SHOULDERS PRIOR TO APPLICATION OF ASPHALT SURFACE TREATMENT, FOG SEAL.

9/14/2006 Relu_esh09_Typ.dgn

PAVEMENT SCHEDULE

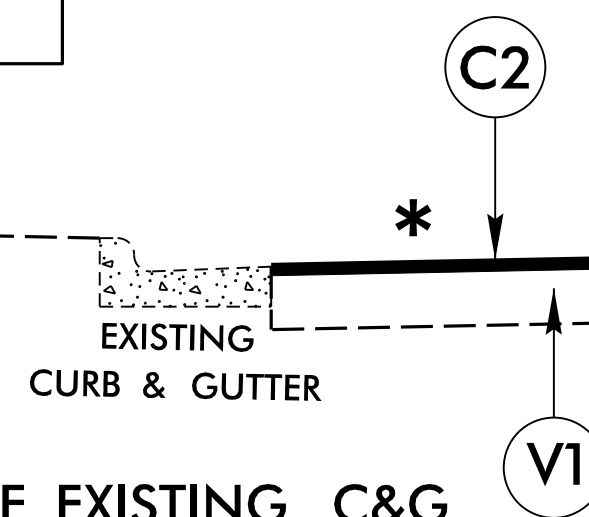
C1	5/8" ULTRA-THIN BONDED WEARING COURSE AT A RATE OF 70 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
V1	MILL 2.0" OF EXISTING ASPHALT PAVEMENT
U	EXISTING PAVEMENT

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

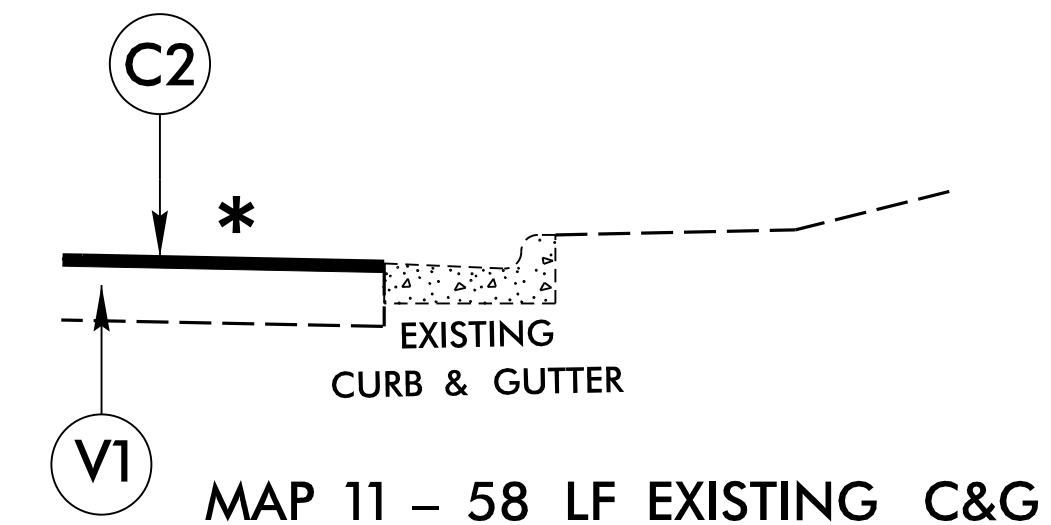


TYPICAL SECTION NO. 2

* MATCH EXISTING CROSS SLOPES



- MAP 16 - 155 LF EXISTING C&G
- MAP 17 - 320 LF EXISTING C&G
- MAP 18 - 285 LF EXISTING C&G
- MAP 19 - 283 LF EXISTING C&G

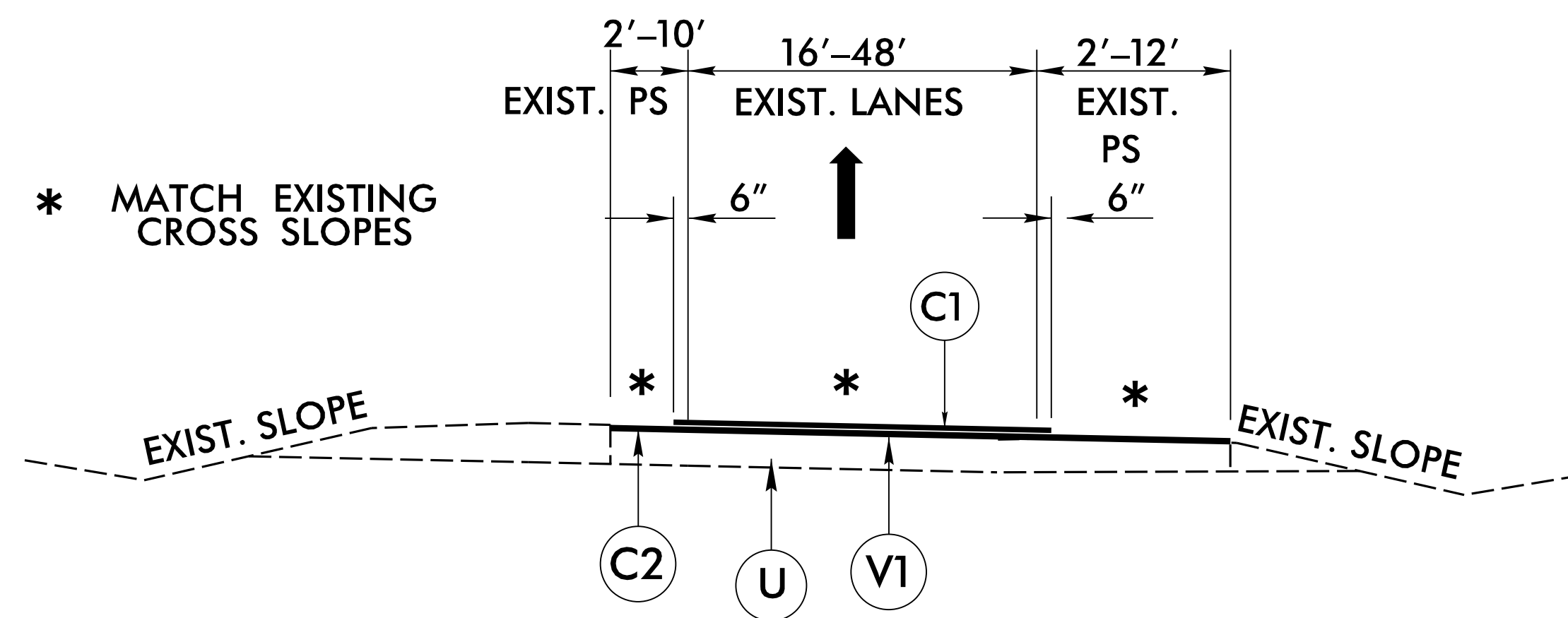


- MAP 11 - 58 LF EXISTING C&G

USE TYPICAL SECTION NO. 2

- | | |
|----------------------|----------------------|
| MAP 2 I-540 WB RAMP | MAP 18 I-540 EB RAMP |
| MAP 3 US-70 EB RAMP | MAP 19 I-540 EB RAMP |
| MAP 4 US-70 WB RAMP | MAP 24 I-540 WB RAMP |
| MAP 8 I-540 WB RAMP | MAP 25 I-540 EB RAMP |
| MAP 9 I-540 WB RAMP | MAP 28 I-540 WB RAMP |
| MAP 10 I-540 EB RAMP | MAP 30 US 1 SB RAMP |
| MAP 11 I-540 EB RAMP | MAP 31 I-540 EB SPUR |
| MAP 12 I-540 WB RAMP | MAP 32 I-540 EB RAMP |
| MAP 13 I-540 WB RAMP | MAP 34 I-540 WB RAMP |
| MAP 14 I-540 EB RAMP | MAP 35 I-540 WB RAMP |
| MAP 15 I-540 EB RAMP | MAP 36 I-540 EB RAMP |
| MAP 16 I-540 WB RAMP | MAP 37 I-540 EB RAMP |

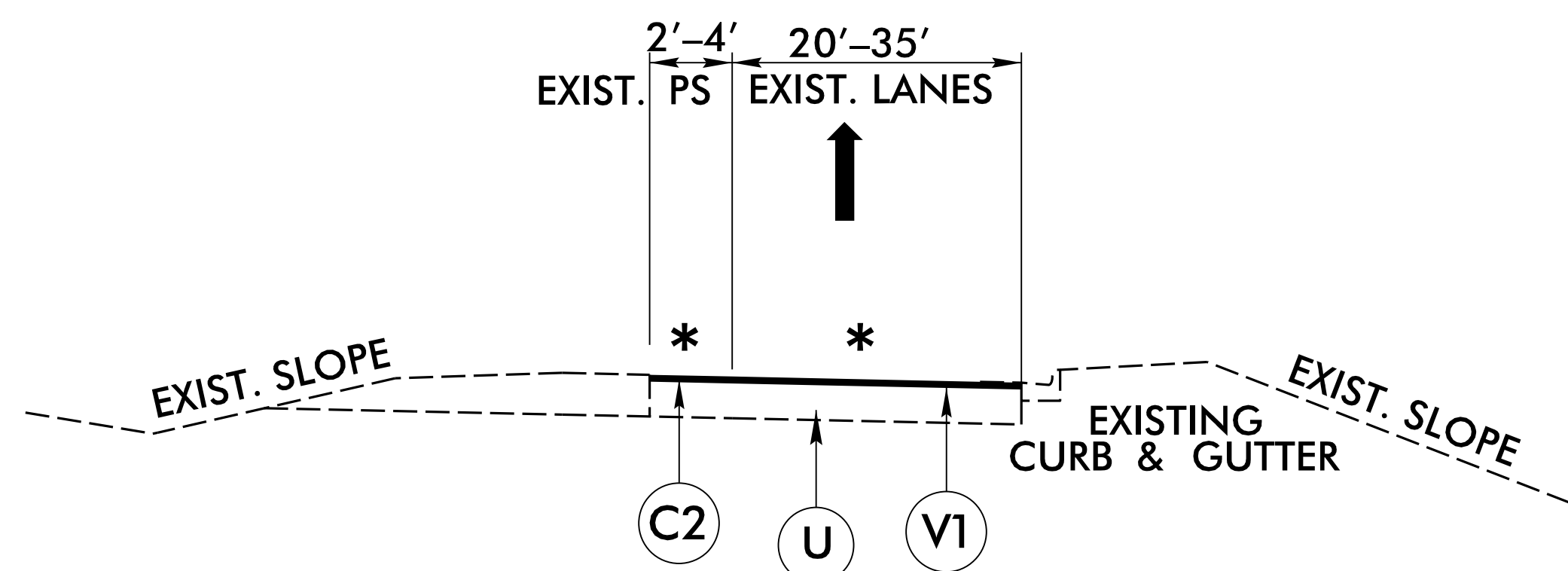
* MATCH EXISTING CROSS SLOPES



TYPICAL SECTION NO. 2A

USE TYPICAL SECTION NO. 2A

- MAP 5 US-70 WB FLYOVER
- MAP 6 US-70 EB FLYOVER
- MAP 33 I-540 EB FLYOVER



TYPICAL SECTION NO. 3

* MATCH EXISTING CROSS SLOPES

USE TYPICAL SECTION NO. 3

- MAP 7 - I-540 EB LOOP
- MAP 20 - I-540 WB SPUR INVERT TYPICAL
- MAP 21 - I-540 WB SPUR INVERT TYPICAL
- MAP 22 - I-540 EB SPUR INVERT TYPICAL
- MAP 23 - I-540 EB SPUR INVERT TYPICAL
- MAP 26 I-540 WB LOOP
- MAP 27 I-540 EB LOOP
- MAP 29 US 1 NB LOOP

8/17/99

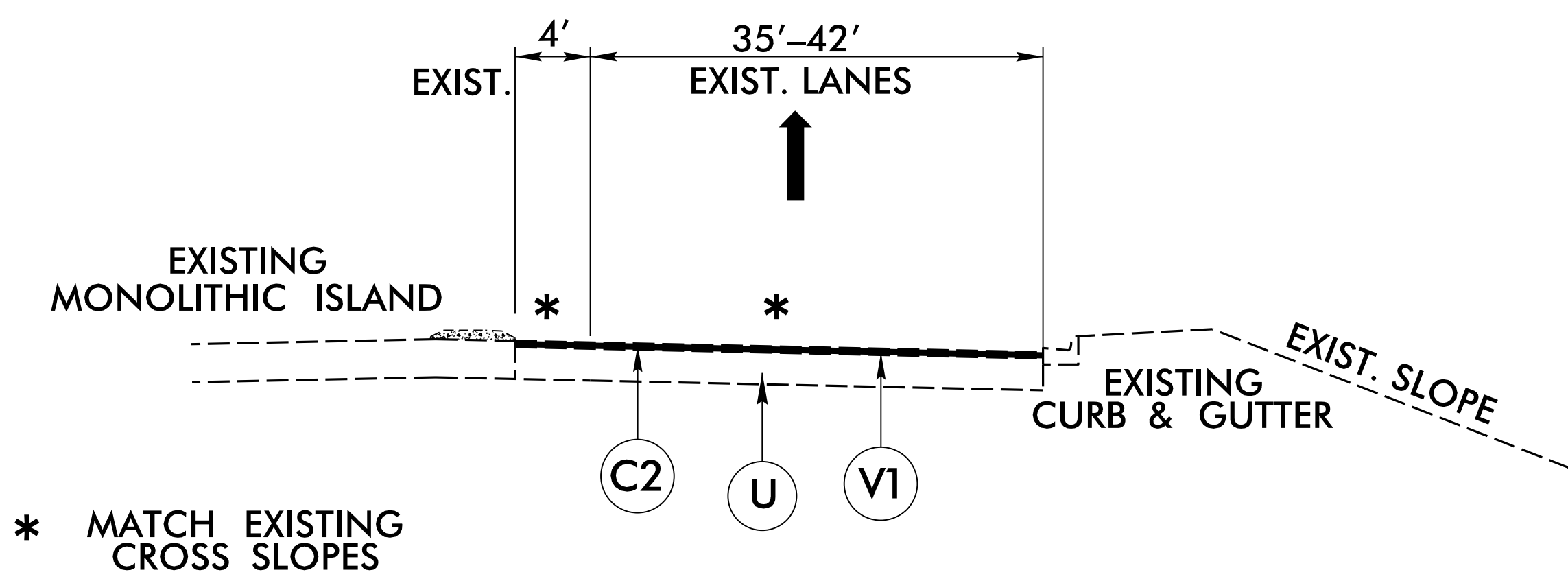
REVISIONS

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PAVEMENT SCHEDULE

C2	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
V1	MILL 2.0" OF EXISTING ASPHALT PAVEMENT
U	EXISTING PAVEMENT

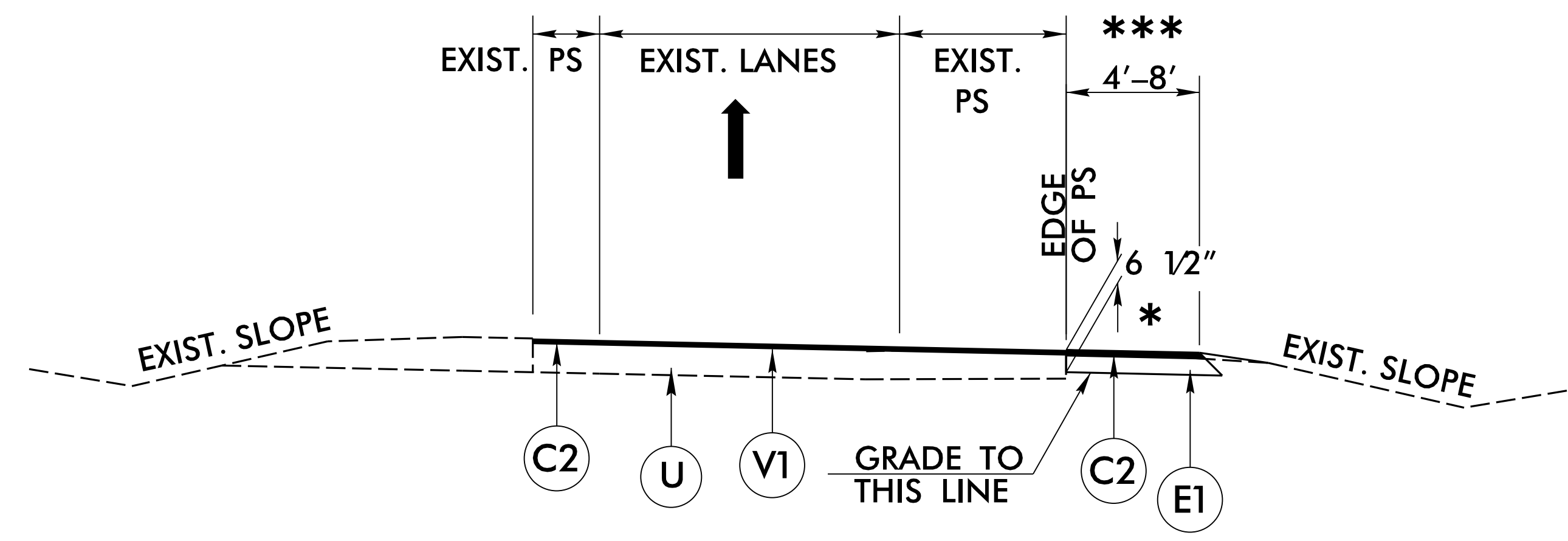
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

- MAP 26 I-540 WB LOOP
- MAP 27 I-540 EB RAMP



TYPICAL SECTION NO. 5

PAVED SHOULDER WIDENING

USE TYPICAL SECTION NO. 5

MAP 9	I-540 WB RAMP	575 LF	4'
MAP 11	I-540 EB RAMP	548 LF	4'
MAP 13	I-540 WB RAMP	520 LF	4'
MAP 14	I-540 EB RAMP	542 LF	8'
MAP 15	I-540 EB RAMP	215 LF	5'
MAP 16	I-540 WB RAMP	500 LF	4'
MAP 17	I-540 WB RAMP	580 LF	4'
MAP 18	I-540 EB RAMP	460 LF	4'
MAP 24	I-540 WB RAMP	300 LF	8'
MAP 25	I-540 EB RAMP	480 LF	4'

8/17/99

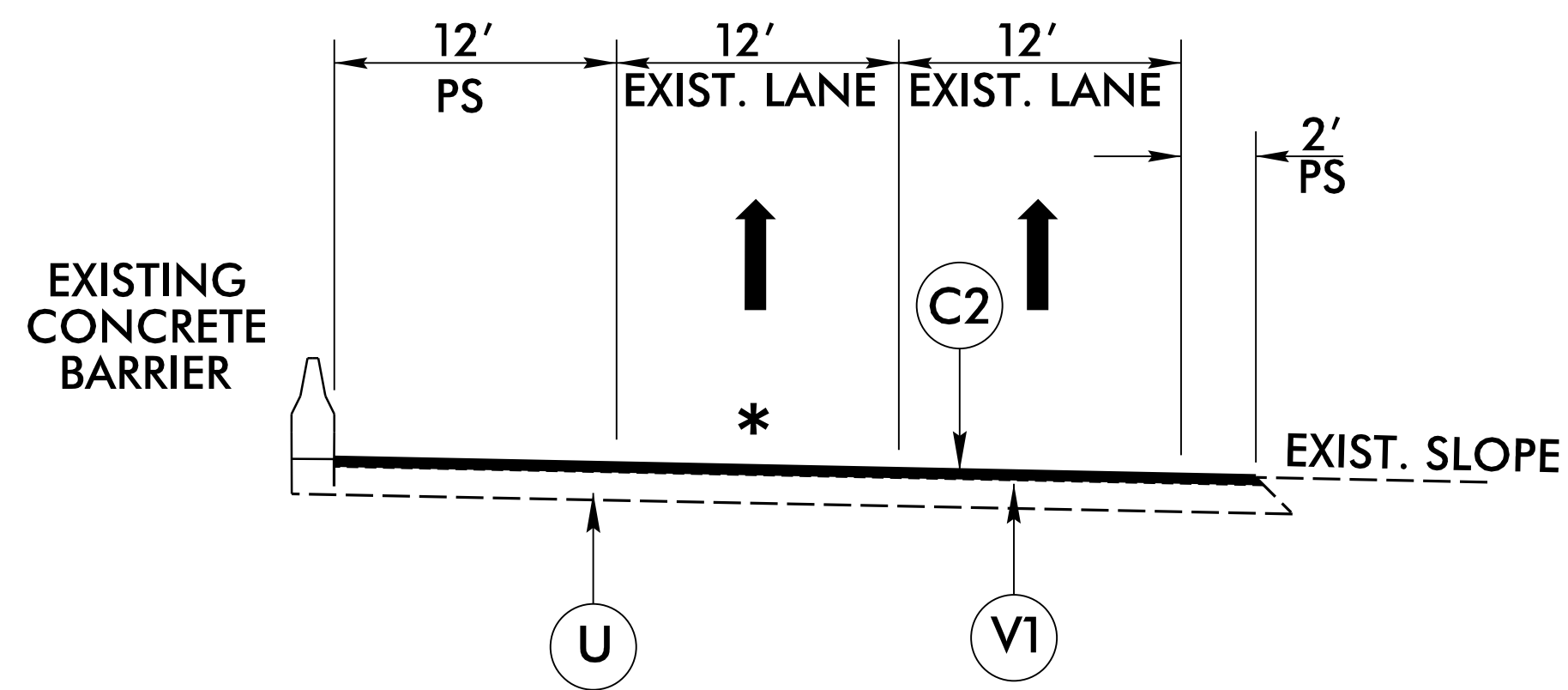
REVISIONS

11/18/2001
11/18/2001
11/18/2001

PAVEMENT SCHEDULE

C2	PROP. APPROX. 2.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
V1	MILL 2.0" OF EXISTING ASPHALT PAVEMENT
U	EXISTING PAVEMENT

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

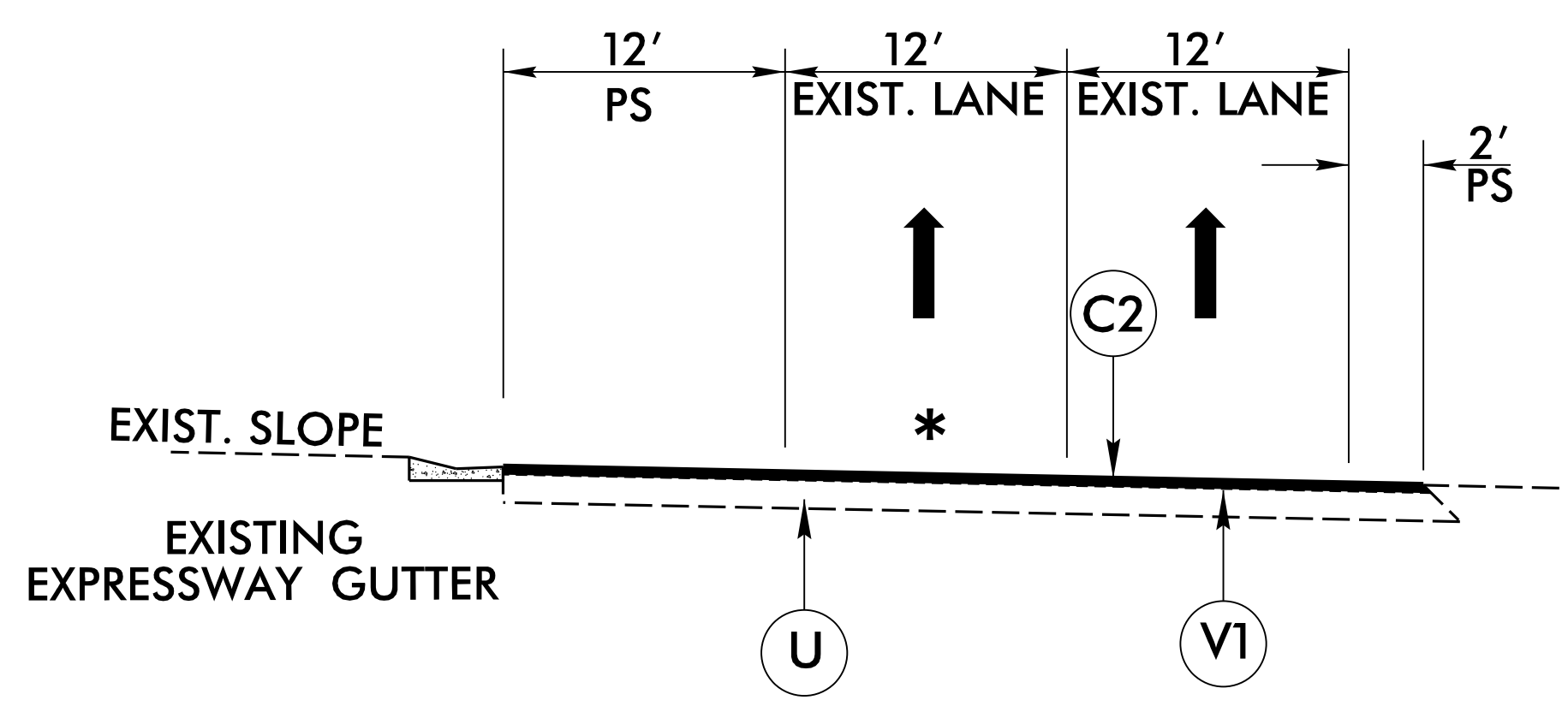


TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

MAP 38 US 70 – WESTBOUND COLLECTOR /DISTRIBUTOR LANE /RAMP

* MATCH EXISTING CROSS SLOPES



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

MAP 38 US 70 – WESTBOUND COLLECTOR /DISTRIBUTOR LANE /RAMP

REVISIONS

8/17/99

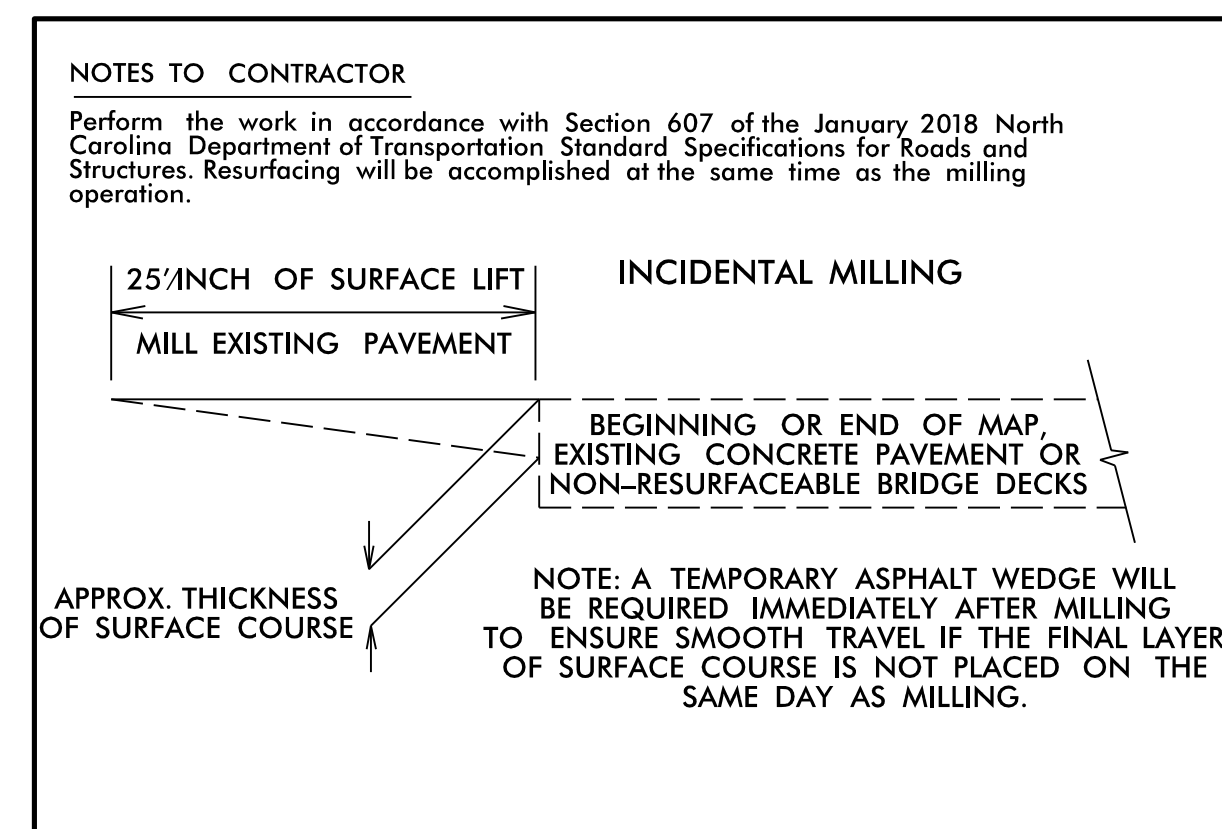
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NOTES

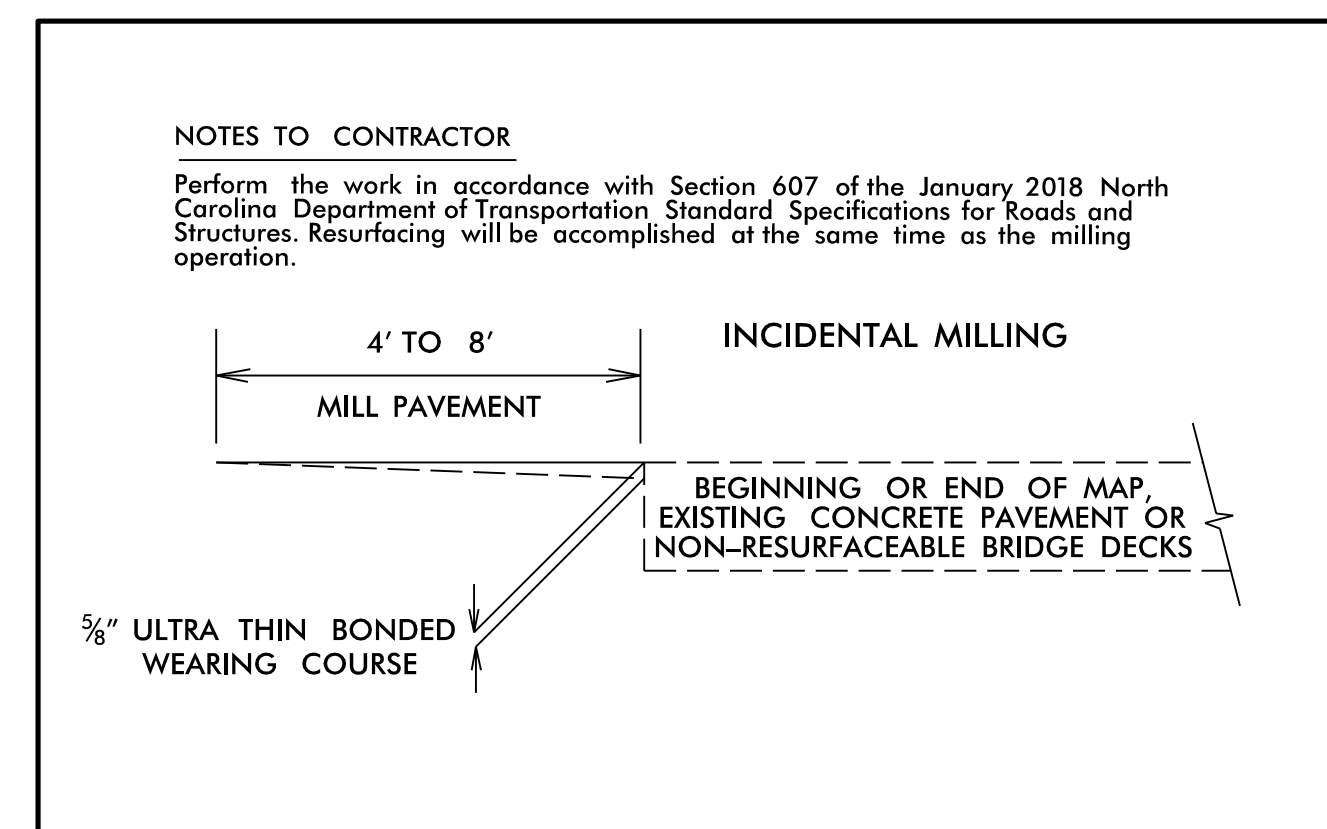
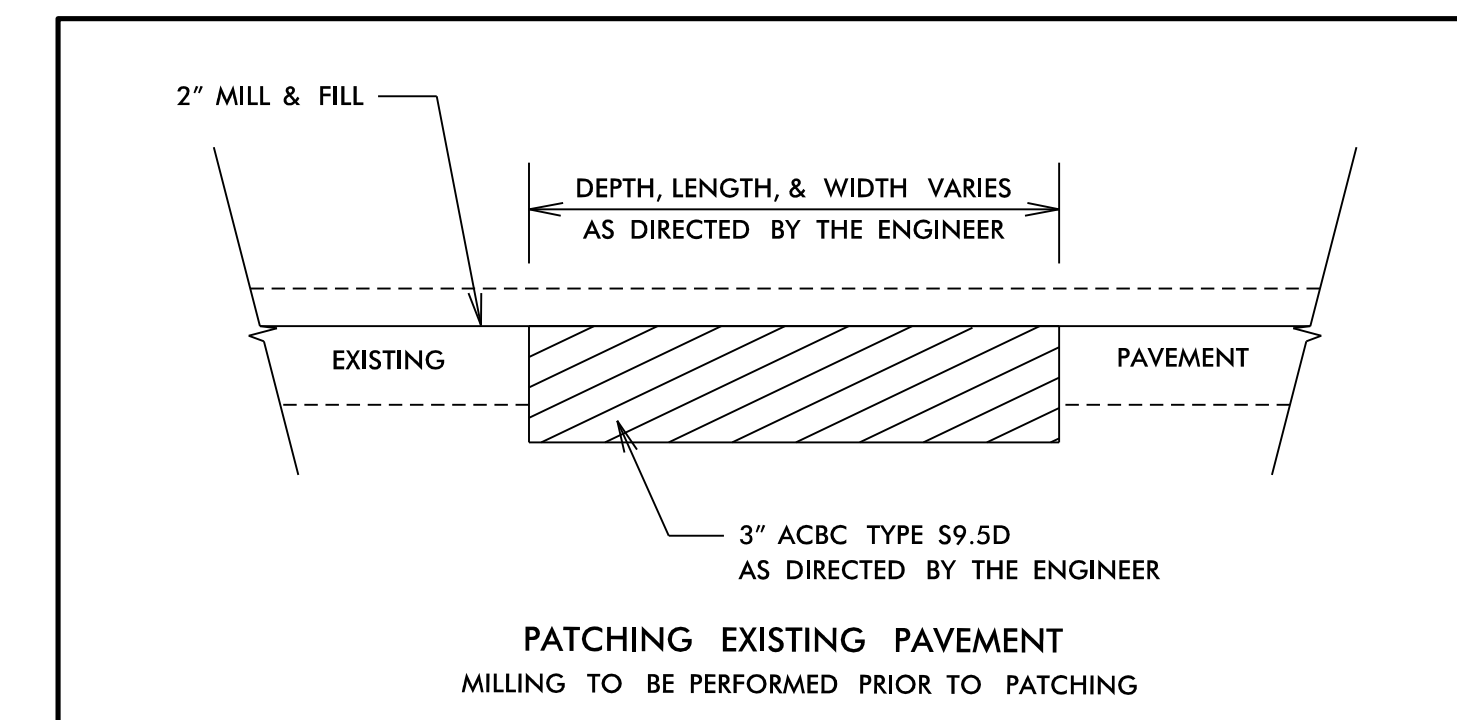
ALL PAVED RAMPS /LOOPS TO BE RESURFACED TO THE Y-LINE E.O.P.S. OR AS DIRECTED BY THE ENGINEER.

EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.

REVISIONS



INCIDENTAL MILLING DETAIL

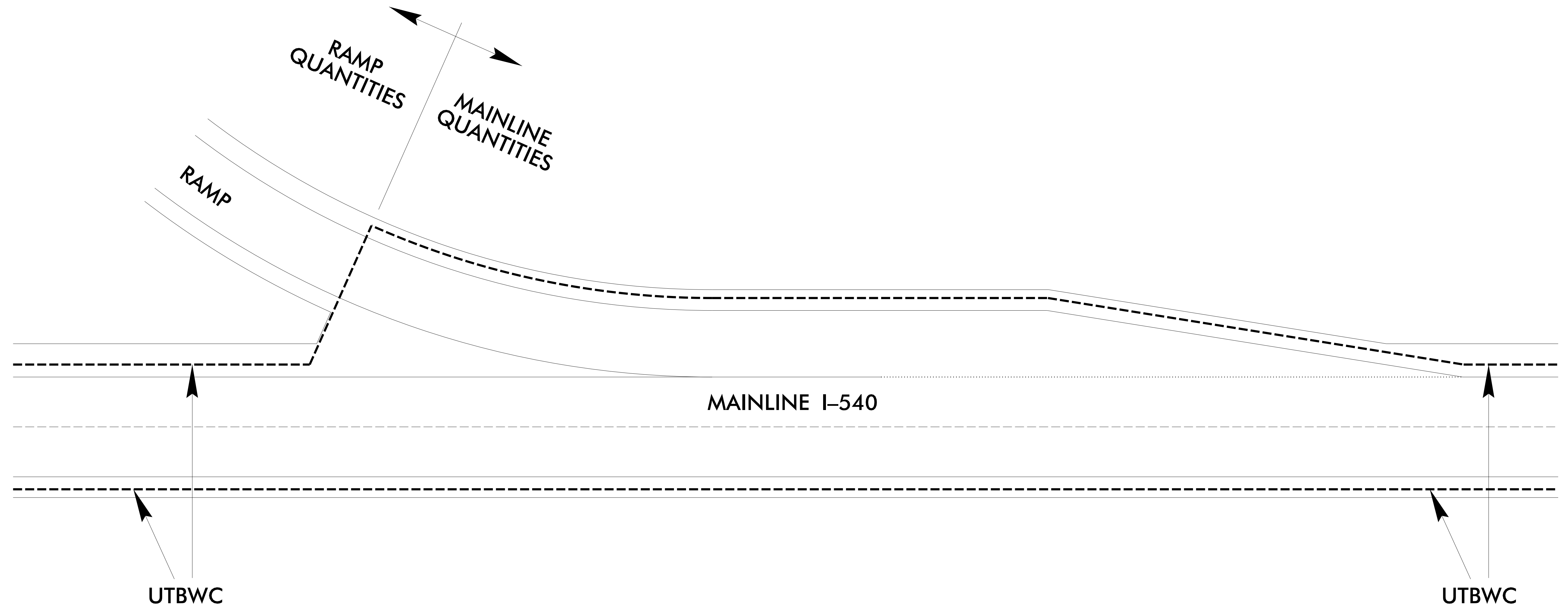


INCIDENTAL MILLING DETAIL

8/17/99

9/21/2006
ITSEB@KIMBERLY
Relu_psh13_Typ.dgn

PAYMENT QUANTITY SEPARATION BETWEEN MAINLINE AND RAMPS
PAVING LIMITS FOR ULTRA-THIN BONDED WEARING COURSE
AT EXIT AND ENTRANCE RAMPS & LOOPS

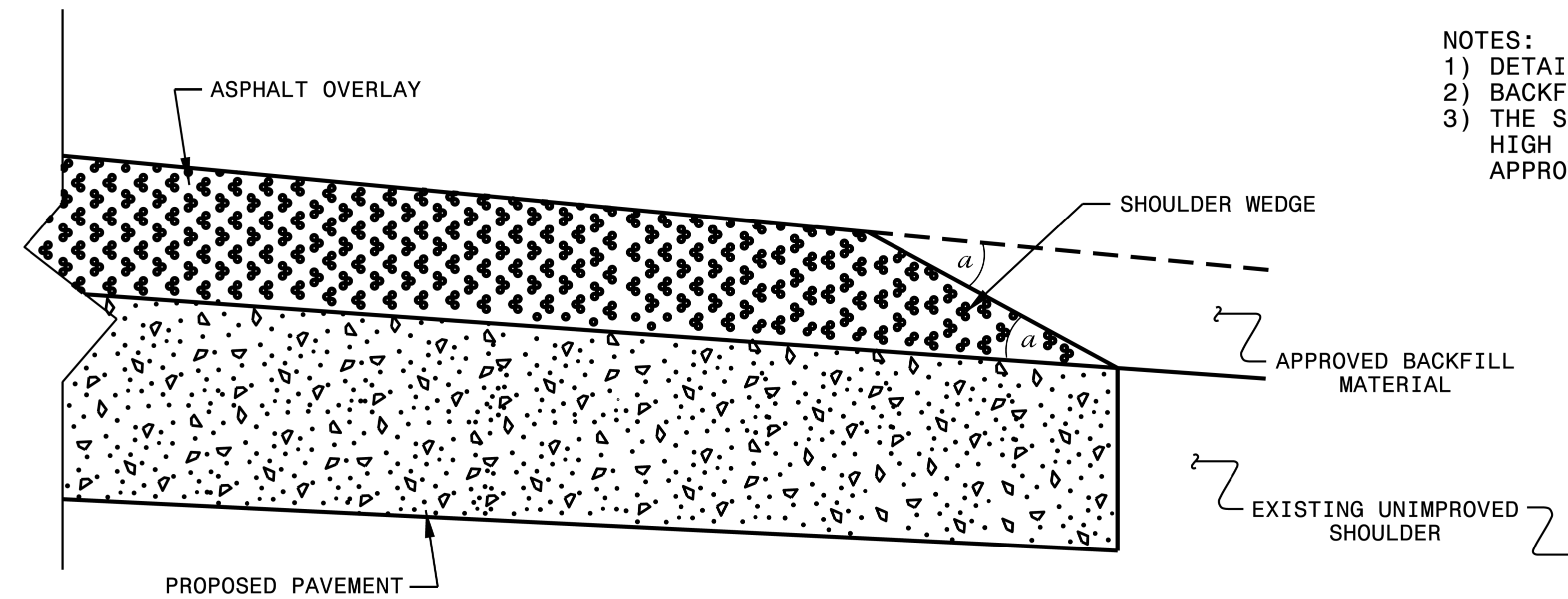


REVISIONS

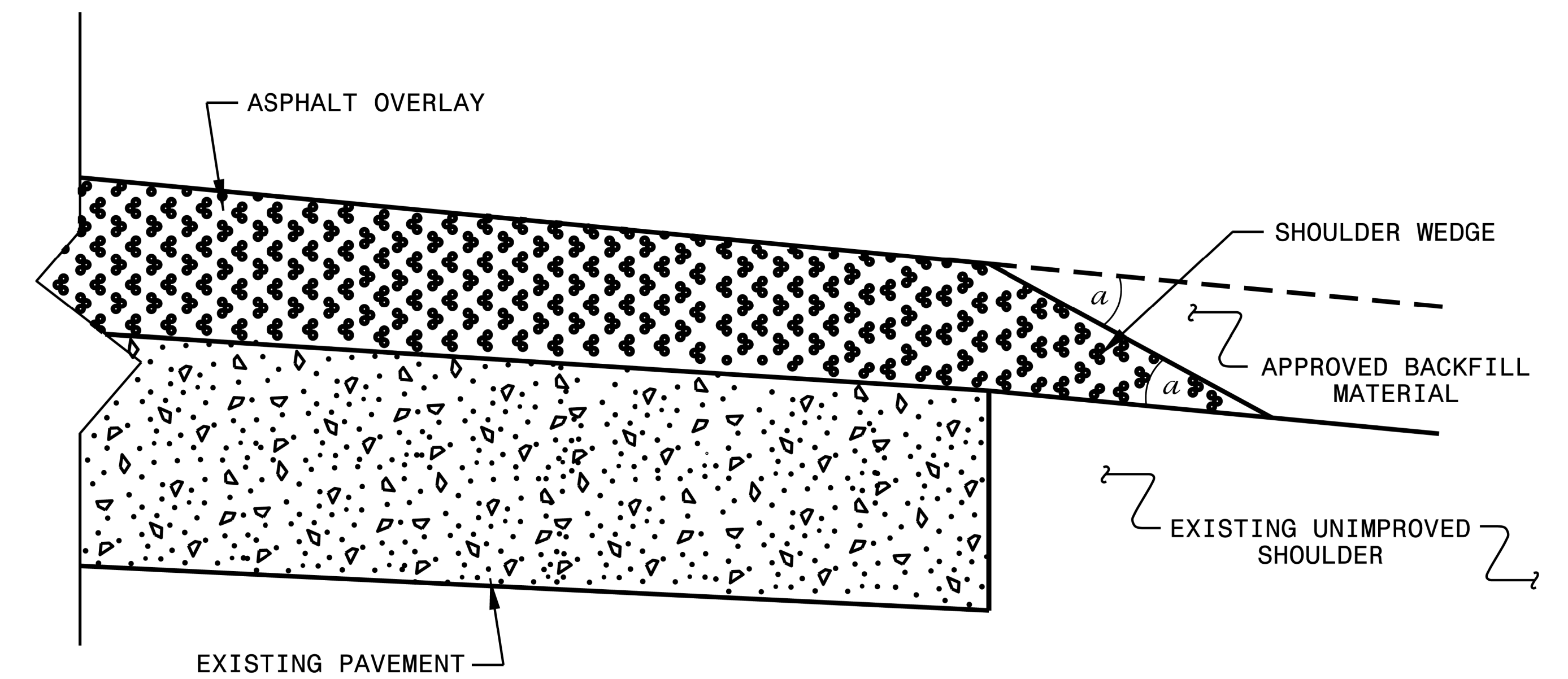
9/21/2006
TJSP.dgn
13A-UTBWC

NOT TO SCALE

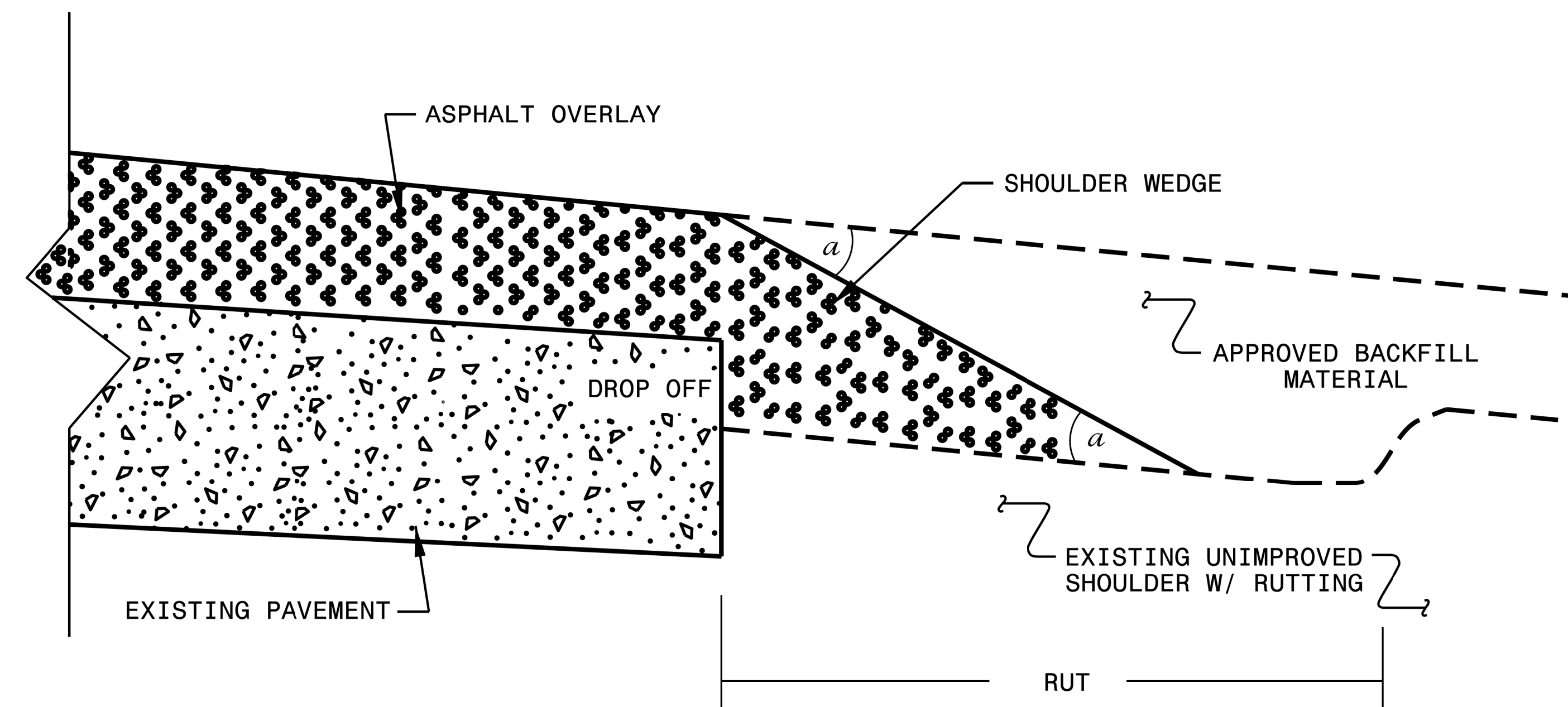
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFC AND ULTRA-THIN BONDED WEARING COURSE.
 - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
 - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ Widening or
 with Existing Paved Shoulder having no dropoffs)



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ NO Widening)



SHOULDER WEDGE DETAIL
 (Resurfacing Adjacent to
 Rutted Shoulder)

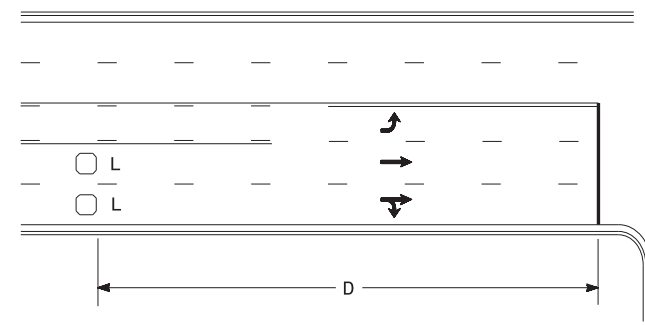
- SHOULDER WEDGE ANGLE = 30°

CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
SHOULDER WEDGE DETAILS	
ORIGINAL BY: T.SPELL	DATE: 7-19-11
MODIFIED BY:	DATE: 2/2/16
CHECKED BY:	DATE:
FILE SPEC.: s:\usr\details\stand\shoulderwedgedetail.dgn	

REVISIONS

22-JAN-2018 09:41
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 P:\porter AT USD-242532

High Speed Detection (≥40 mph)

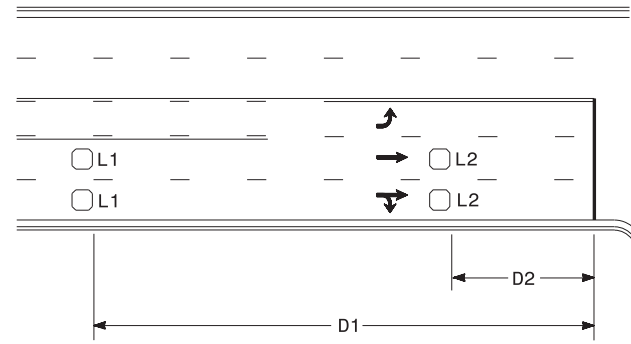


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

L = 6ft X 6ft
Wired separately

Volume Density Operation

OR

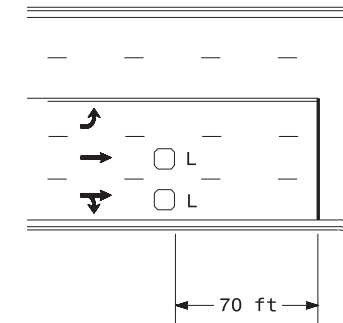


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

L1 = 6ft X 6ft
Wired in series
L2 = 6ft X 6ft
Wired in series

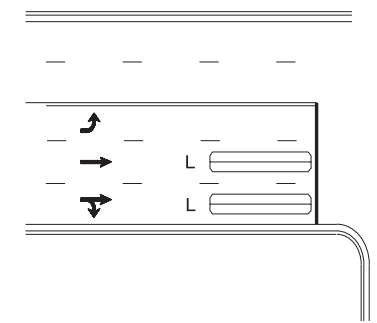
"Stretch" Operation

Low Speed Detection (≤35 mph)



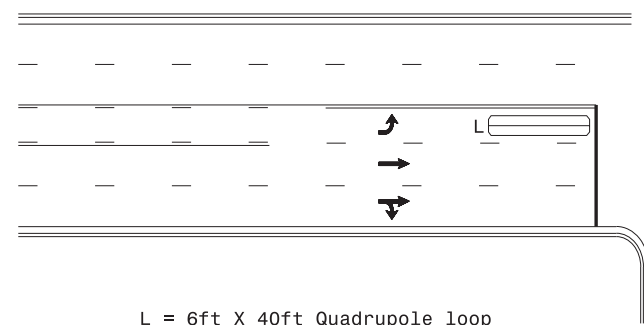
L = 6ft X 6ft
Wired in series

OR



L = 6ft X 40ft
Quadrupole loop, wired separately

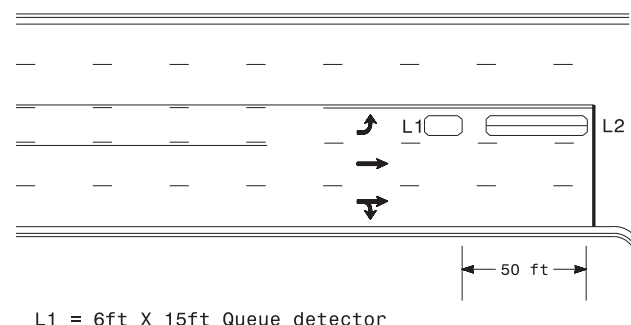
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

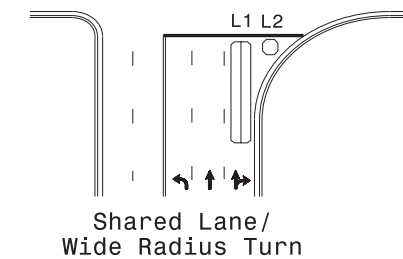
OR



L1 = 6ft X 15ft Queue detector
L2 = 6ft X 40ft Quadrupole loop

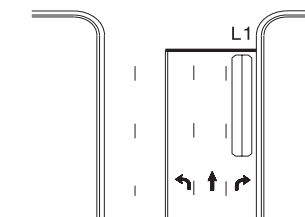
Queue Loop Detection

Right Turn Lane Detection

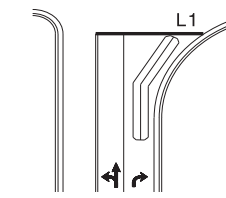


Shared Lane/
Wide Radius Turn

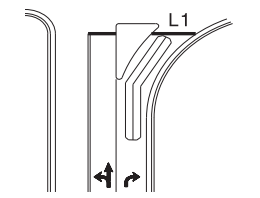
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

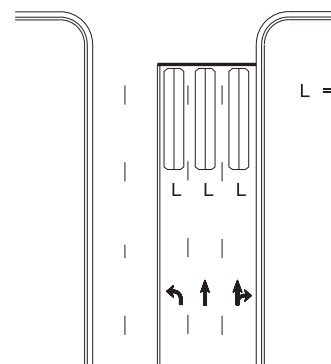


Wide Radius Turn



Channelized Turn

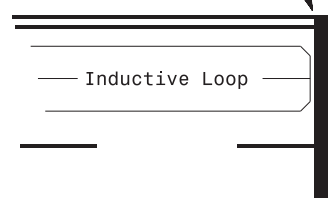
Side Street Detection



L = 6ft X 40ft
Quadrupole loop
Wired to separate
detectors/channels

Presence Loop Placement at Stop Lines

Locate loop slightly
behind leading
edge of stop line



- Note:
Loop may be located in advance
of stop line under any of the
following conditions:
- 1) stop line is greater than 15' from edge of intersecting roadway
 - 2) loop detects a permissive or protected/permissive left turn
 - 3) for an exclusive right turn lane

Recommended Number of Turns

Single 6' X 6' loop
(when wired separately):

Length of Lead-in ft	Number of Turns
< 250	3
250-375	4
375-525	5
> 525	6

Quadrupole loops: Use 2-4-2 turns

6' X 15' Loops:
Lead-in < 150', use 2 turns
Lead-in > 150', use 3 turns

750 N. Greenfield Pkwy, Garner, NC 27529

Prepared in the Offices of:

TRANSPORTATION MOBILITY AND SAFETY DIVISION
STATE OF NORTH CAROLINA
SIGNAL DESIGN SECTION

SCALE: N/A

Typical Signal Loop Locations

PLAN DATE: September 2020	REVIEWED BY: JPG
PREPARED BY: PLA	REVIEWED BY:
REVISIONS	INIT. DATE

9/8/2020

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

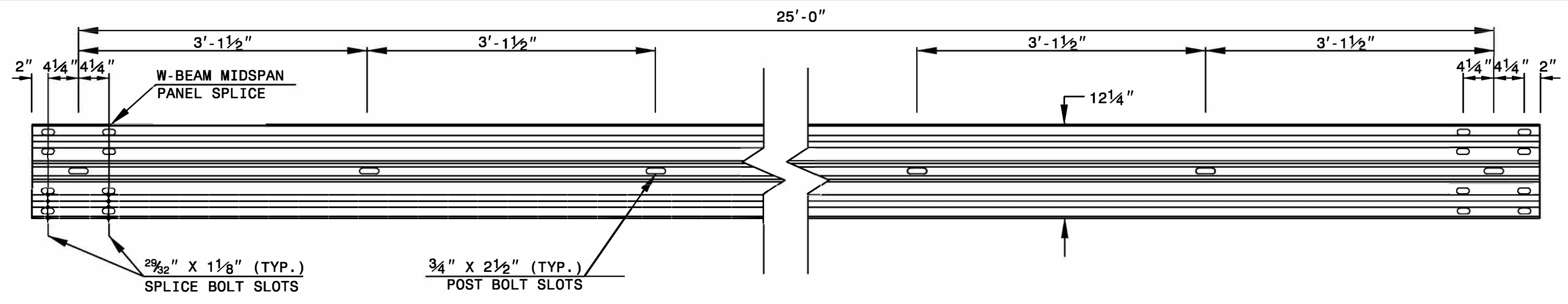
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

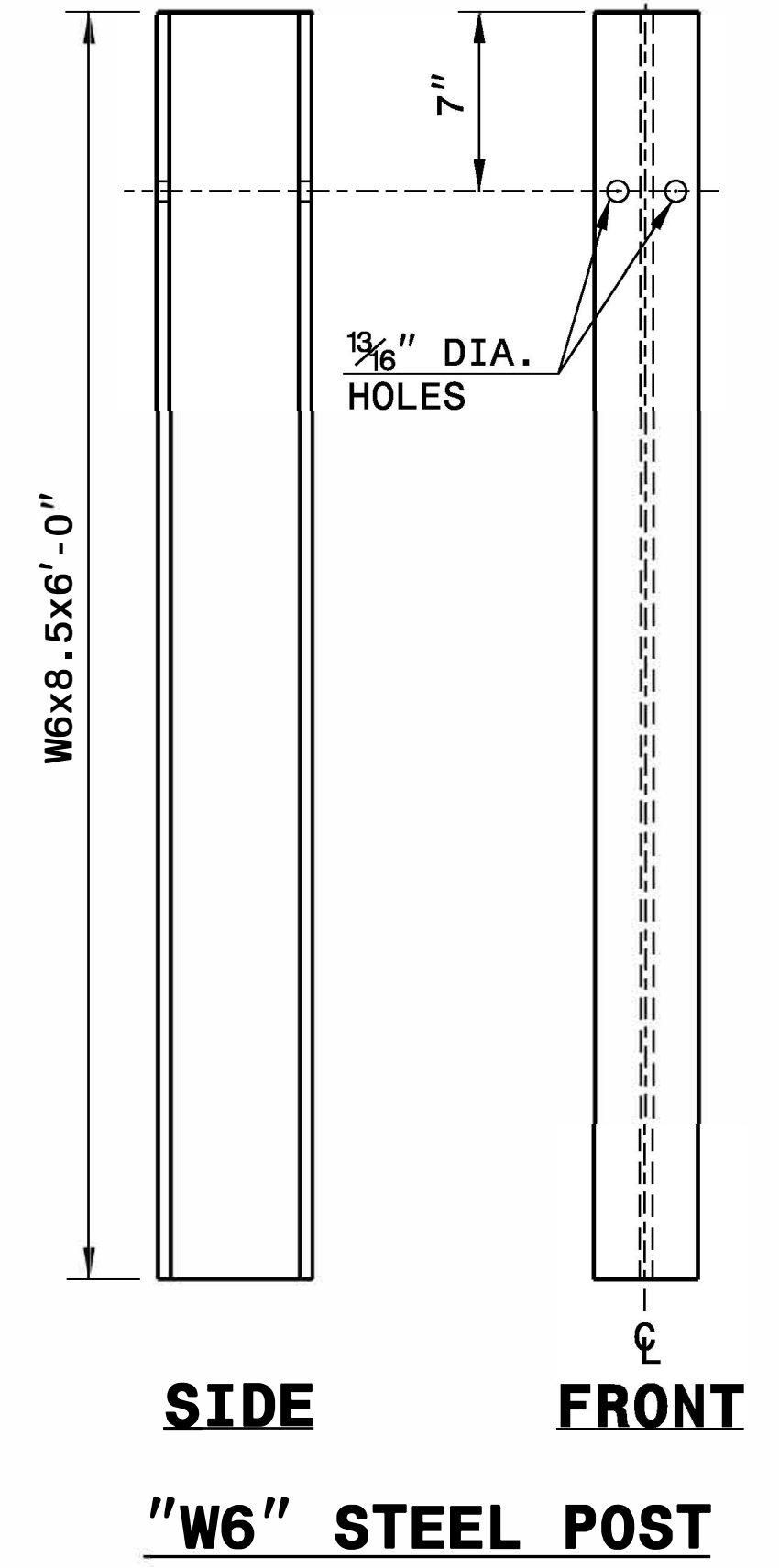
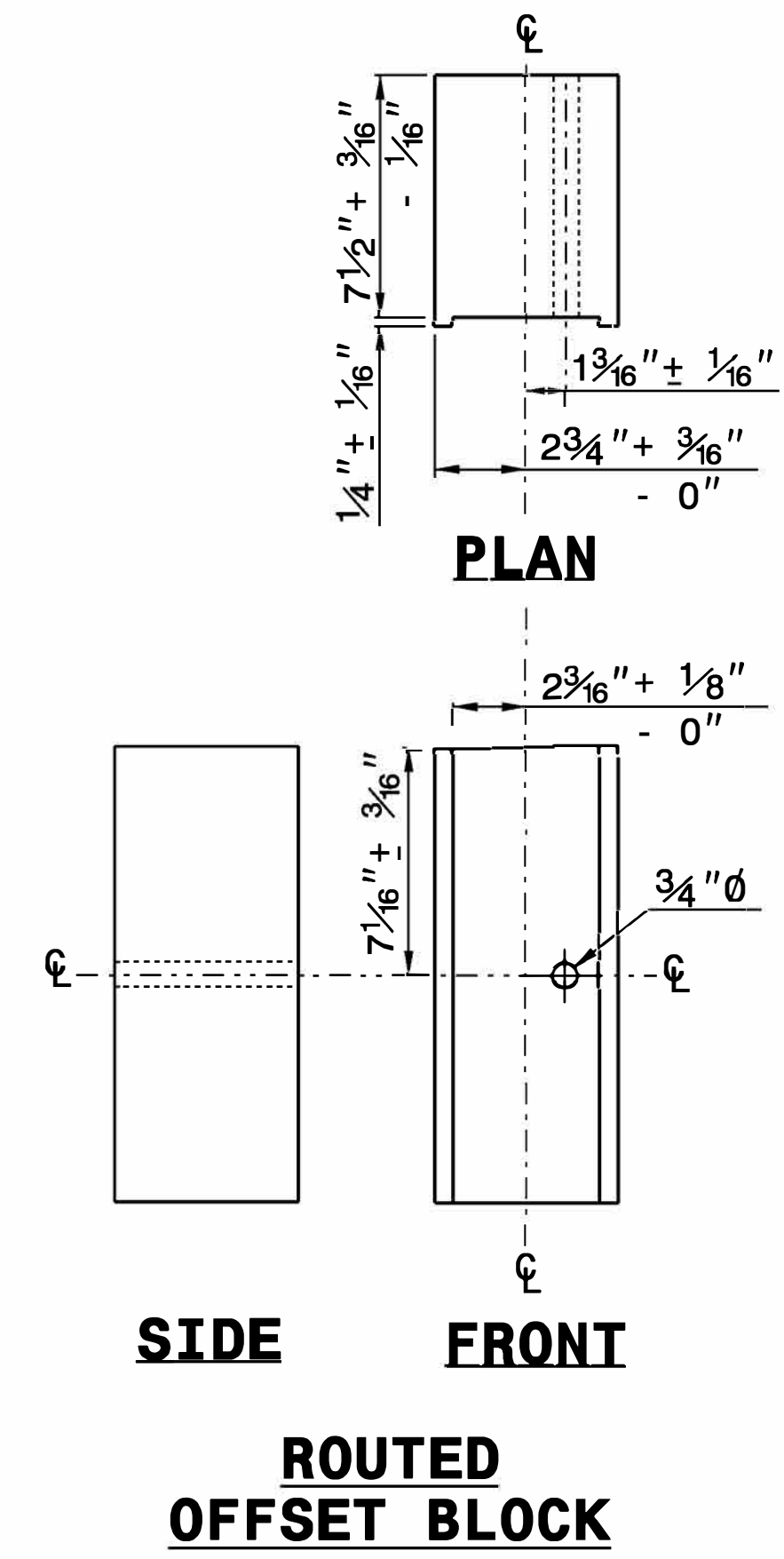
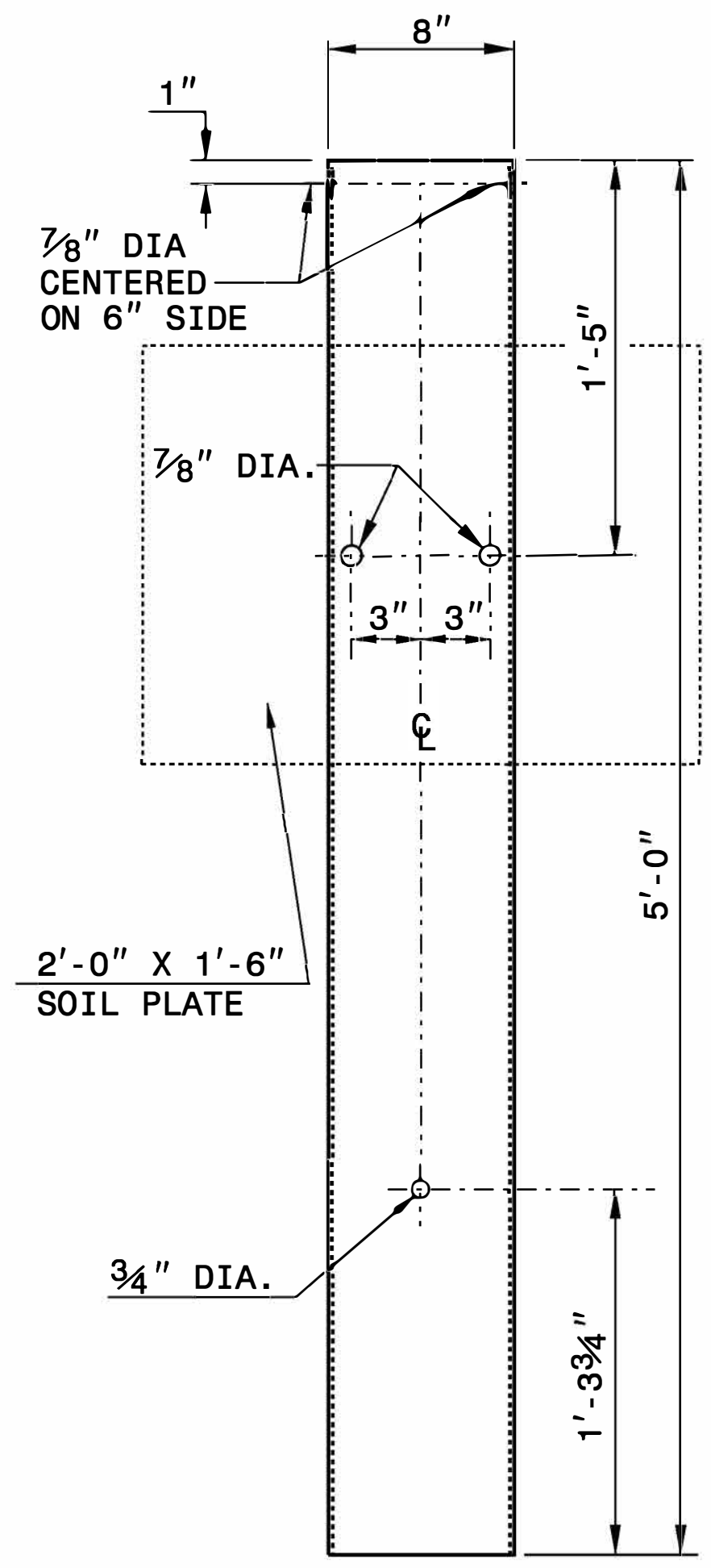
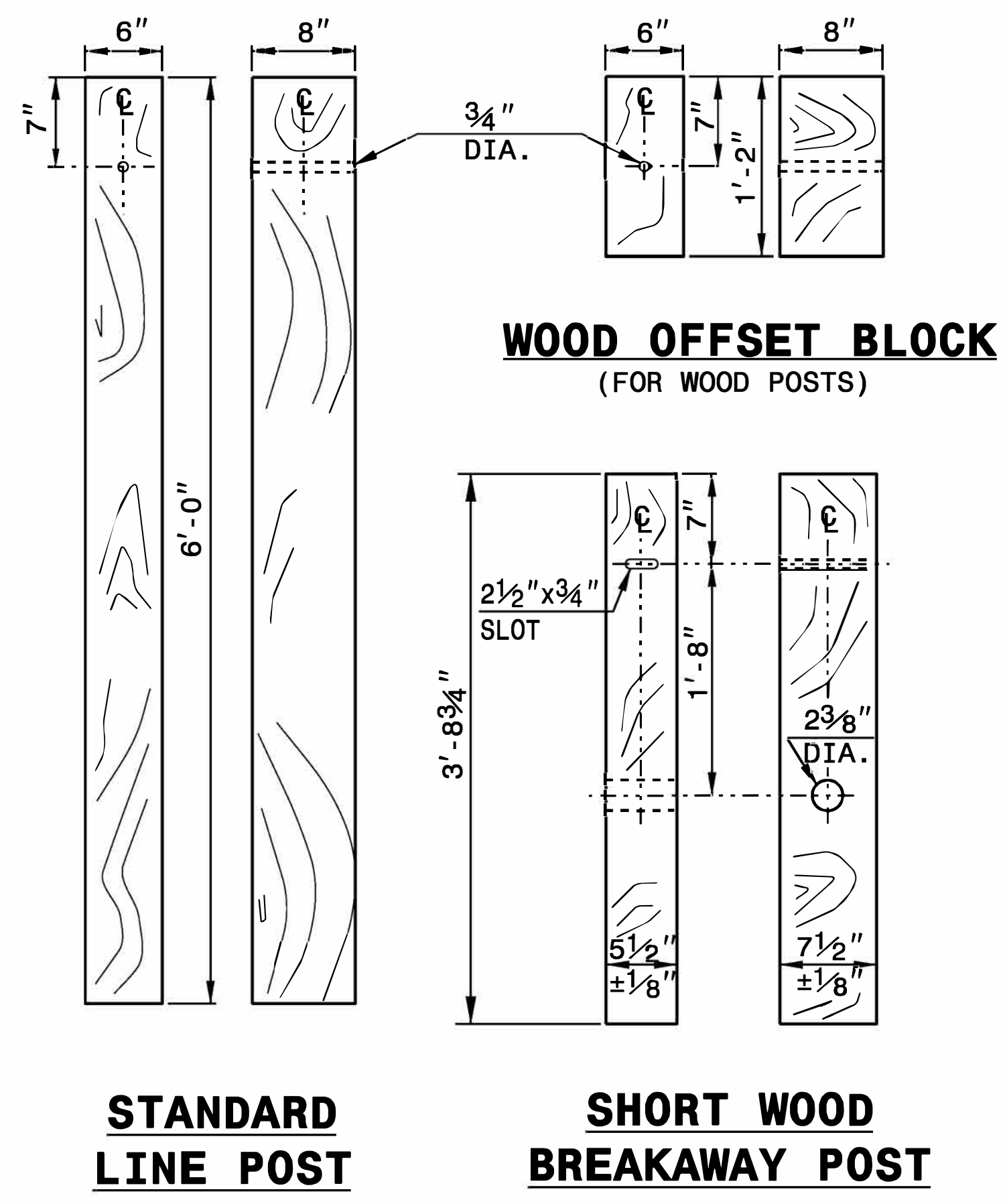
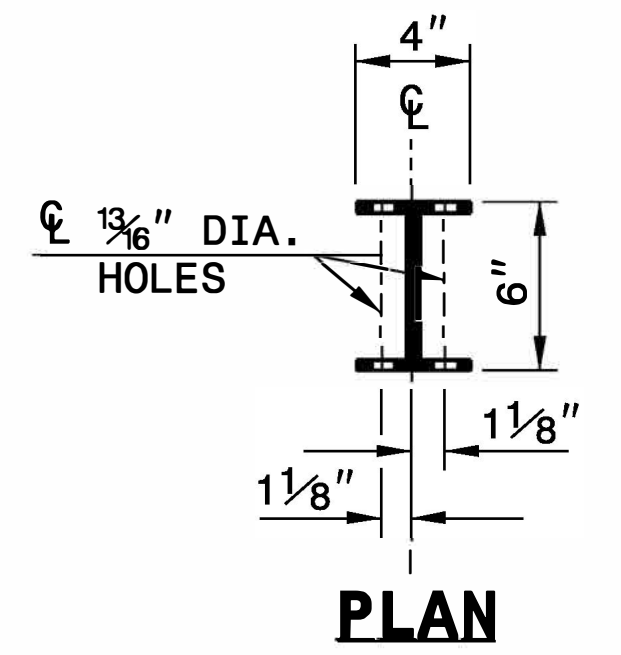
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

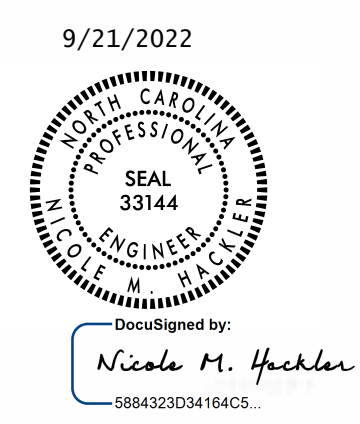
SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



SYSTEM PARTS



CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON	DATE: 3-7-2018
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	