

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 6

PLANS
May 31, 2017

CONTRACT ID: DF00163

WBS ELEMENT NO.: 2017CPT.06.14.10241.1

FEDERAL AID NO.: STATE FUNDED

COUNTY: COLUMBUS

TIP NO.: -----

LENGTH OF PROJECT: 1.03 MILES

ROUTE NO.: NC 410

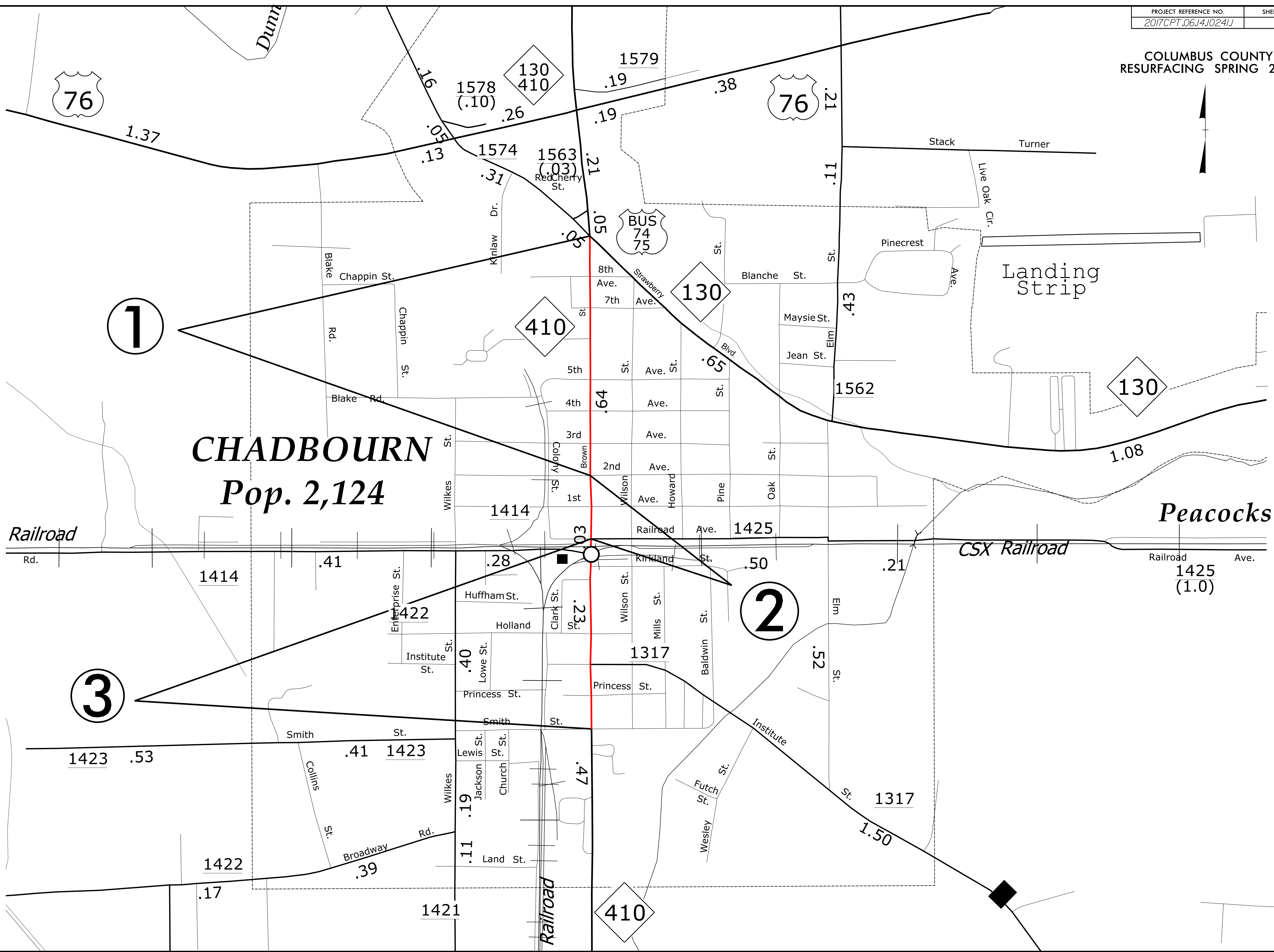
TYPE OF WORK: RESURFACING, MILL & FILL, PROFILE MILLING & PVT. MKGS.

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COLUMBUS COUNTY
RESURFACING SPRING 2017



CHADBOURN
Pop. 2,124

1

2

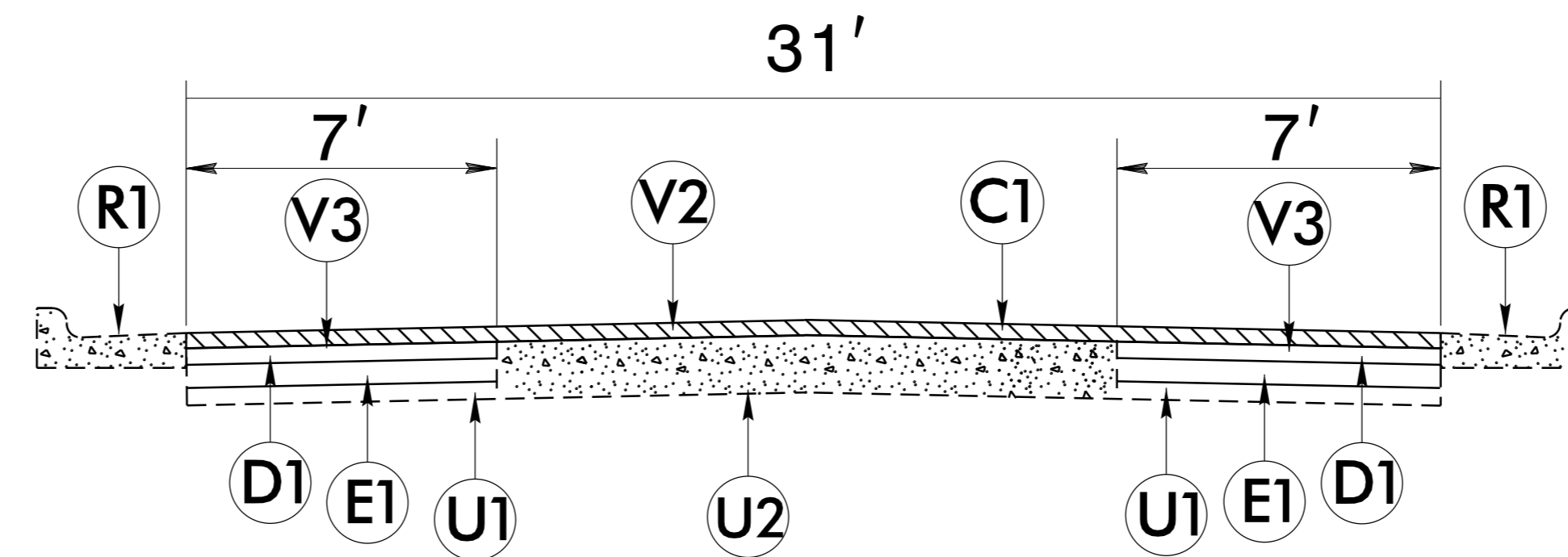
3

REVISIONS

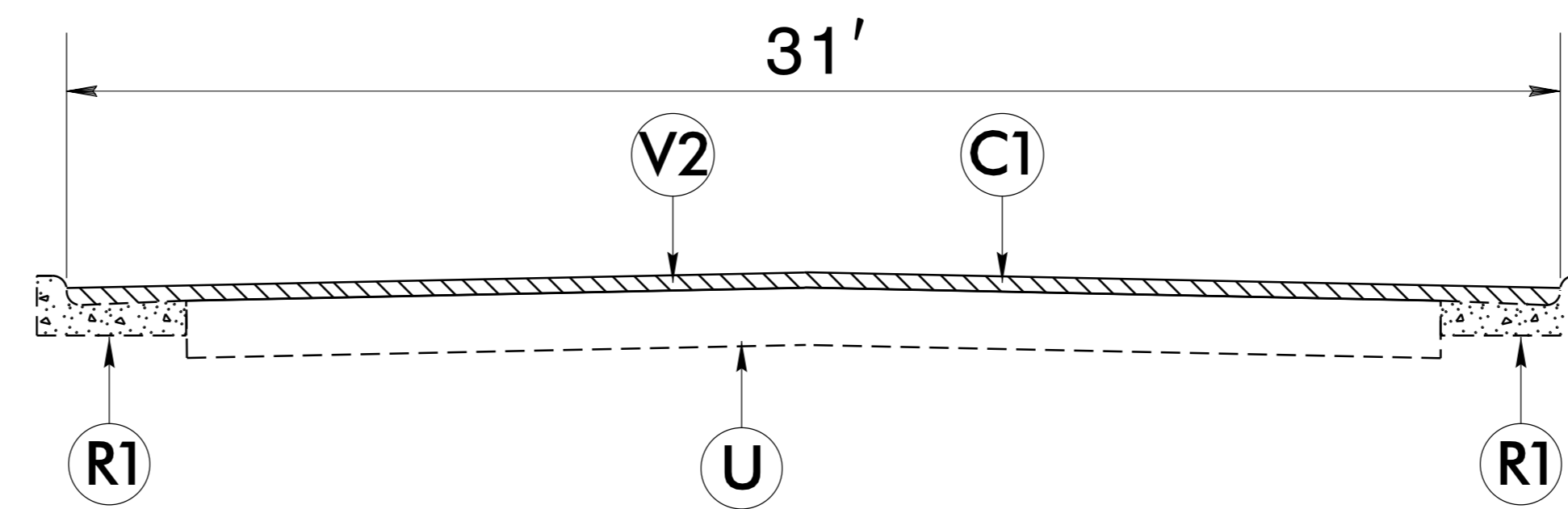
08-MAY-2017 14:02
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 8/17/99

PAVEMENT SCHEDULE

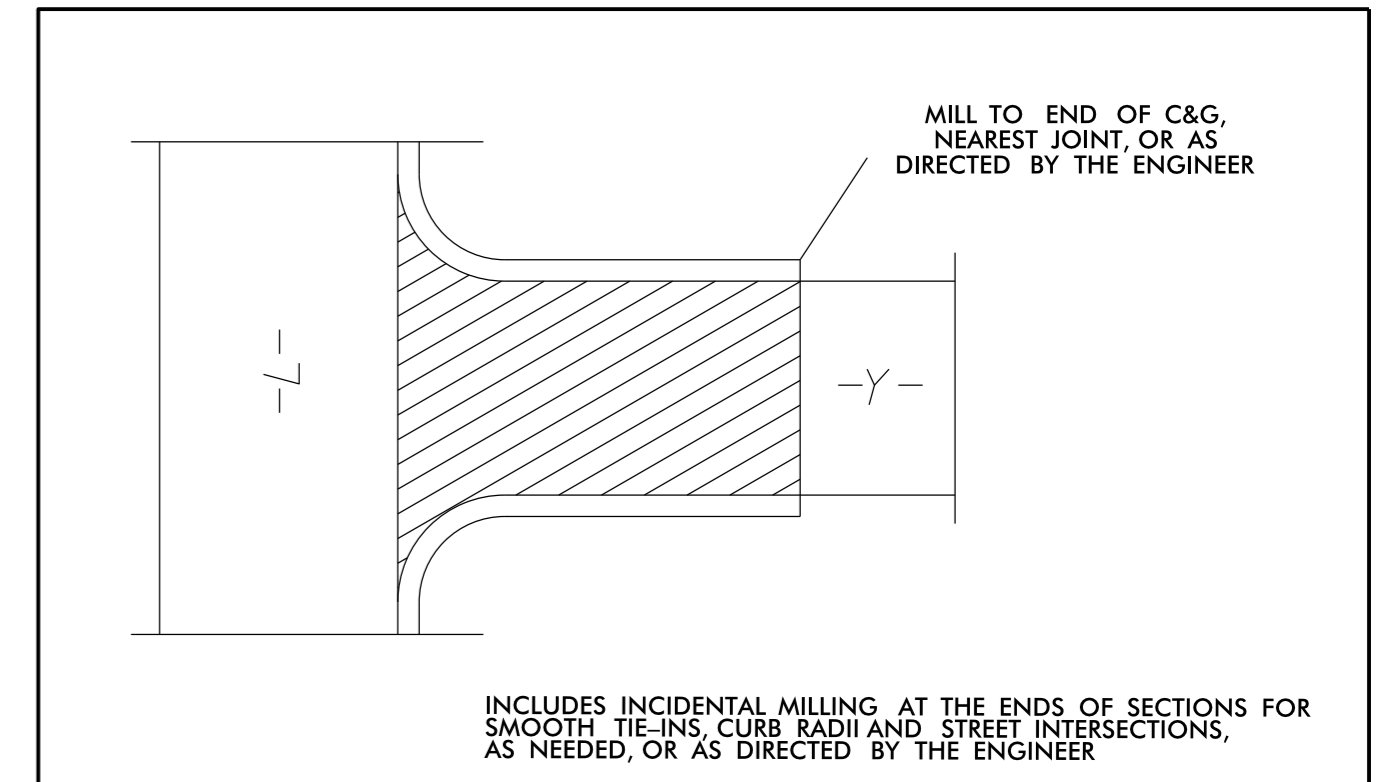
| | |
|----|--------------------------------------------------------------------------------------------------|
| C1 | 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. |
| D1 | 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| E1 | 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. |
| R1 | EXISTING CURB AND GUTTER |
| U1 | EXISTING ASPHALT PAVEMENT |
| U2 | EXISTING CONCRETE PAVEMENT |
| V1 | 0" - 1½" MILLING |
| V2 | 1½" MILLING (ENTIRE WIDTH OF EXISTING ROADWAY) |
| V3 | 10" MILLING (ADDITIONAL) |



TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 2



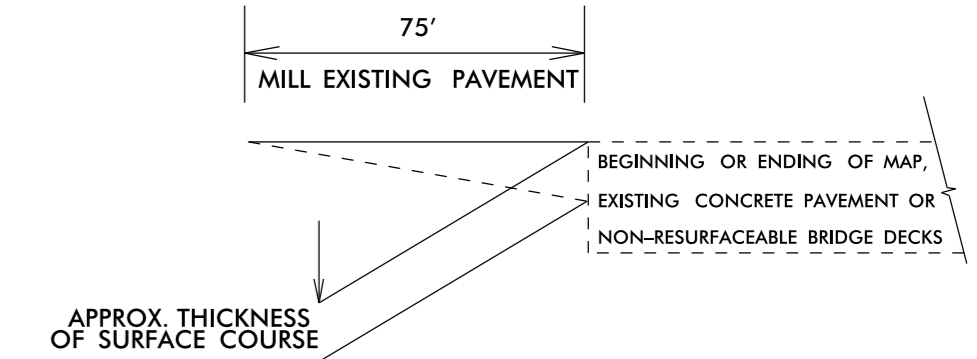
MILLING AT CURB AND GUTTER INTERSECTIONS

NOTES TO CONTRACTOR

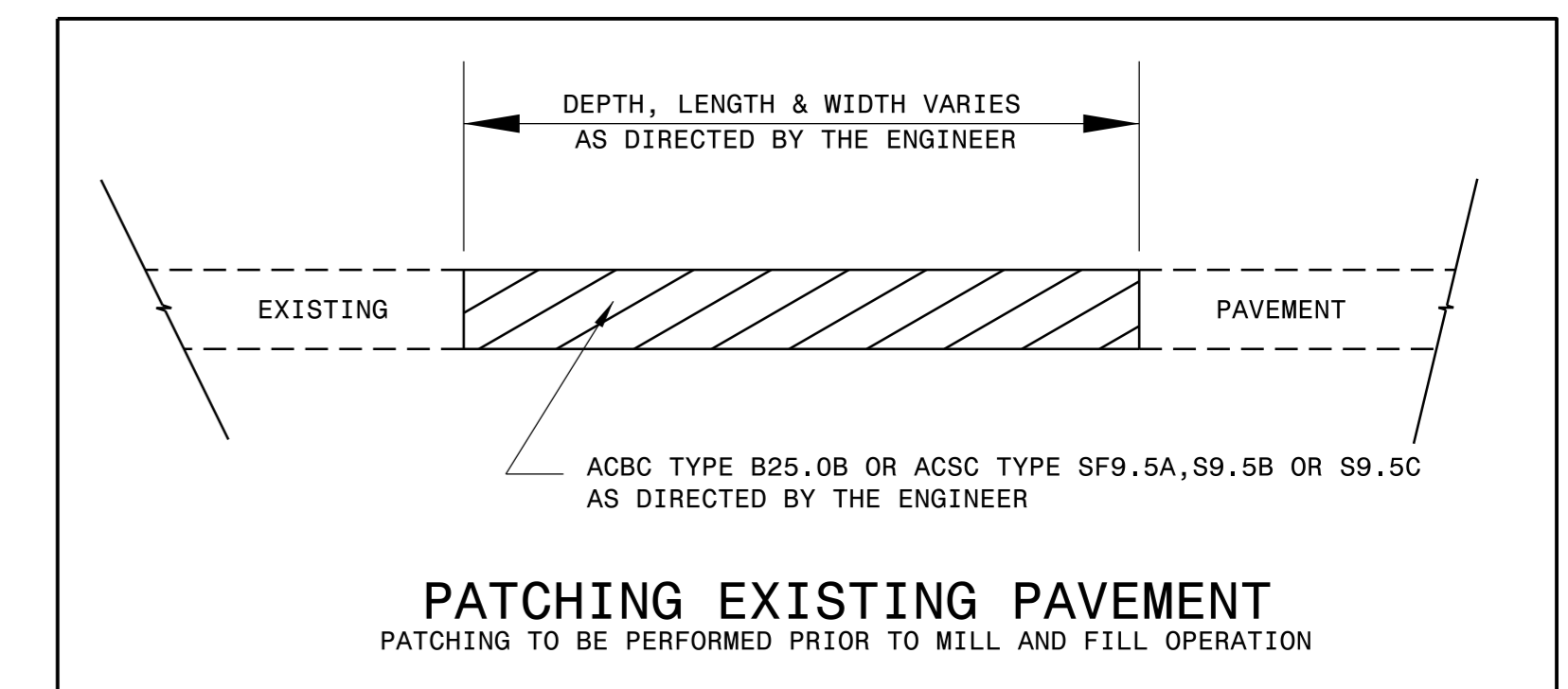
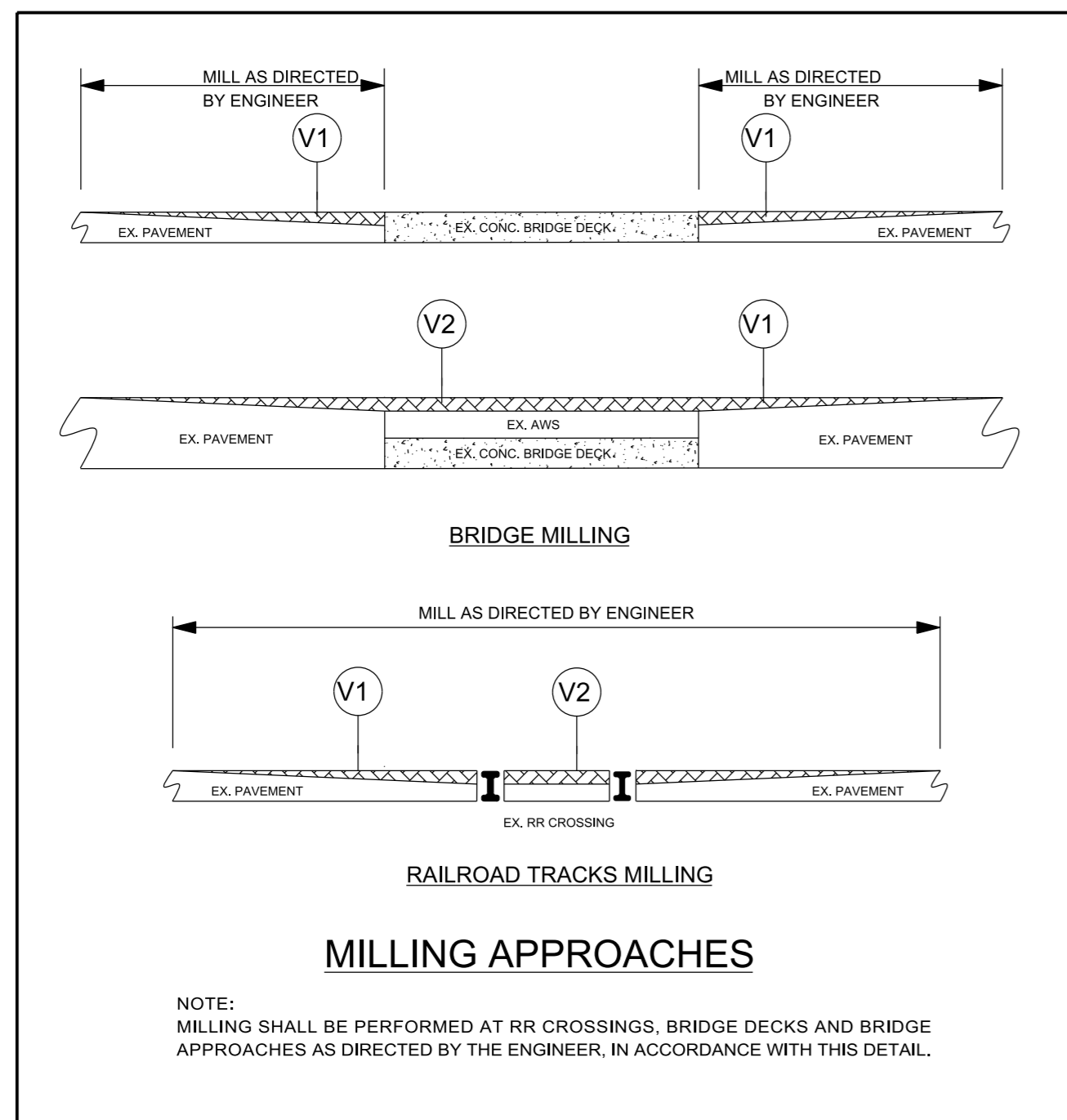
FOR SURFACE MIXES OVER 1" IN THICKNESS, MILL THE EXISTING PAVEMENT IN ACCORDANCE WITH THE FOLLOWING SKETCH AS DIRECTED BY THE ENGINEER.

LOCATIONS SHALL INCLUDE TIES INTO EXISTING CONCRETE PAVEMENT, AT BRIDGE APPROACHES WHERE THE BRIDGE WILL NOT BE RESURFACED, AND AT THE BEGINNING AND ENDING POINT OF EACH RESURFACING MAP.

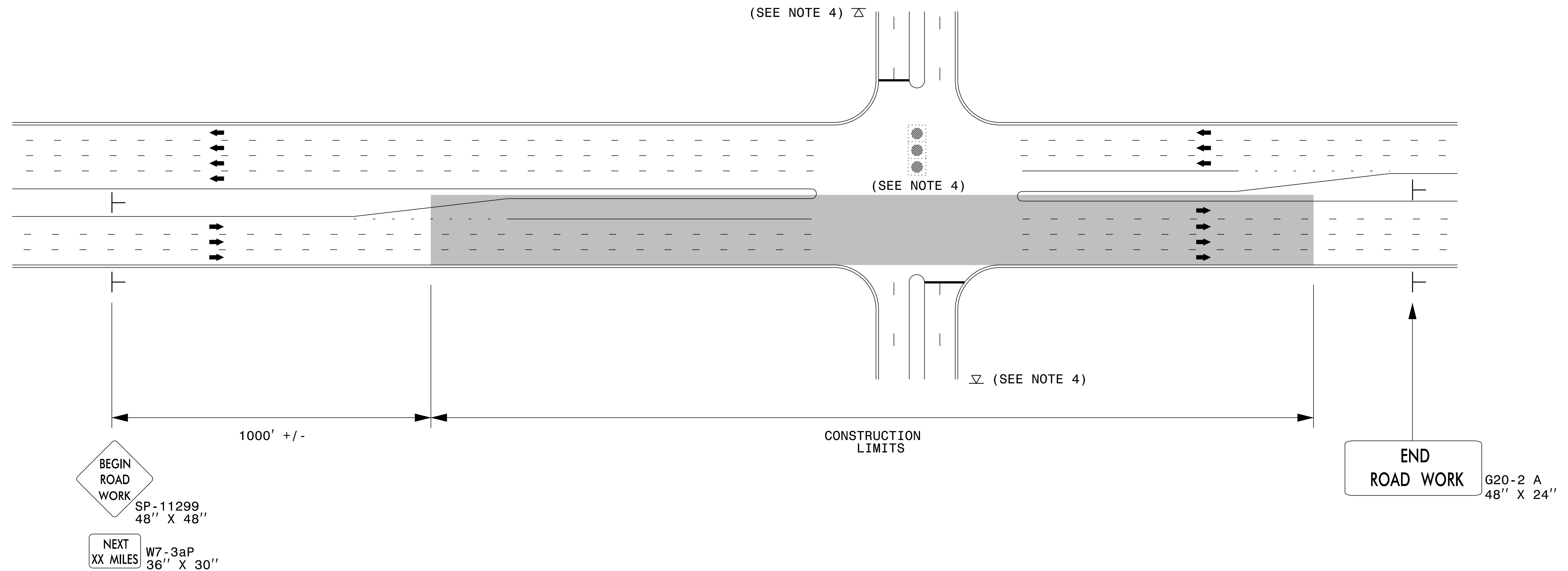
PERFORM THE WORK IN ACCORDANCE WITH SECTION 607 OF THE JANUARY 2012 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. RESURFACING WILL BE ACCOMPLISHED AT THE SAME TIME AS THE MILLING OPERATION.



MILLING AT PAVEMENT TIE-INS DETAIL



URBAN / SUBURBAN WORKZONES

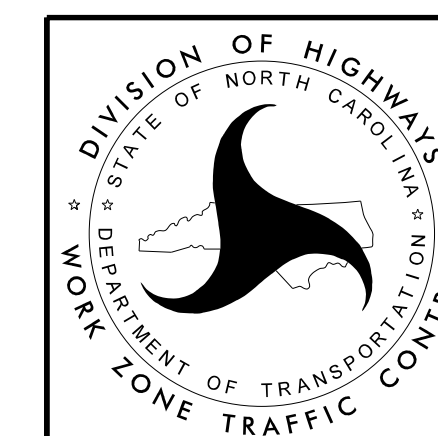


NOTES:

- 1) 48" x 48" SIZED SIGNS (SP- 11299) MAY BE REDUCED TO 36" X 36" ON ROADWAYS WITH SPEED LIMITS OF 40 MPH OR LESS.
- 2) MOUNT SIGNS THAT ARE LARGER THAN 10 SQUARE FEET IN AREA ON TWO OR MORE WOOD OR U-CHANNEL SUPPORTS. PERFORATED SQUARE TUBING SUPPORT SYSTEMS MAY SUPPORT LARGER AREAS ON A SINGLE SUPPORT. FOLLOW MANUFACTURER'S RECOMMENDATIONS. THESE SYSTEMS SHALL BE NCHRP 350 COMPLIANT AND NCDOT APPROVED.
- 3) ADVANCE WARNING SIGNS NOT REQUIRED ON NON-SIGNALIZED SIDE STREETS.
- 4) MAY USE LAW ENFORCEMENT TO CONTROL TRAFFIC AT SIGNALIZED INTERSECTIONS AS DIRECTED BY THE ENGINEER. PROVIDE PORTABLE "ROAD WORK AHEAD" (W20-1) SIGNS 500' IN ADVANCE ALONG BOTH APPROACHES FROM THE SIDE STREETS WHEN PAVING PROCEEDS THROUGH THE INTERSECTION.
- 5) LATERAL CLEARANCE AT ALL SIGN LOCATIONS SHALL BE 2' AS MEASURED FROM THE EDGE OF PAVEMENT OR THE FACE OF THE CURB. WHEN UNABLE TO OBTAIN THE LATERAL CLEARANCE WITHIN THE MEDIAN AREA USE SHOULDER MOUNTS ONLY.
- 6) SIGN MOUNT LOCATIONS SHALL NOT BLOCK SIDEWALKS OR DRIVEWAYS.
- 7) IF STATIONARY GENERAL WARNING SIGNS ARE USED, THEY WILL BE PAID FOR PER SECTION 104 OF THE NCDOT STANDARD SPECIFICATIONS AS EXTRA WORK.
- 8) IF MILLED AREAS ARE NOT PAVED BACK BY THE END OF THE WORK DAY, PORTABLE SIGNS SHALL BE USED TO WARN DRIVERS OF THE PRESENT CONDITIONS. THESE ARE TO INCLUDE, BUT NOT LIMITED TO "ROUGH ROAD" W8-8, "UNEVEN LANES" W8-11, "GROOVED PAVEMENT" W8-15 w/MOTORCYCLE PLAQUE MOUNTED BELOW. THESE ARE TO BE DOUBLE INDICATED ON MULTI-LANE ROADWAYS WITH SPEED LIMITS 45 MPH AND GREATER WHERE LATERAL CLEARANCE CAN BE OBTAINED WITHIN THE MEDIAN AREAS. THESE PORTABLE SIGNS ARE INCIDENTAL TO THE OTHER ITEMS OF WORK INCLUDED IN THE TEMPORARY TRAFFIC CONTROL (LUMP SUM) PAY ITEM.

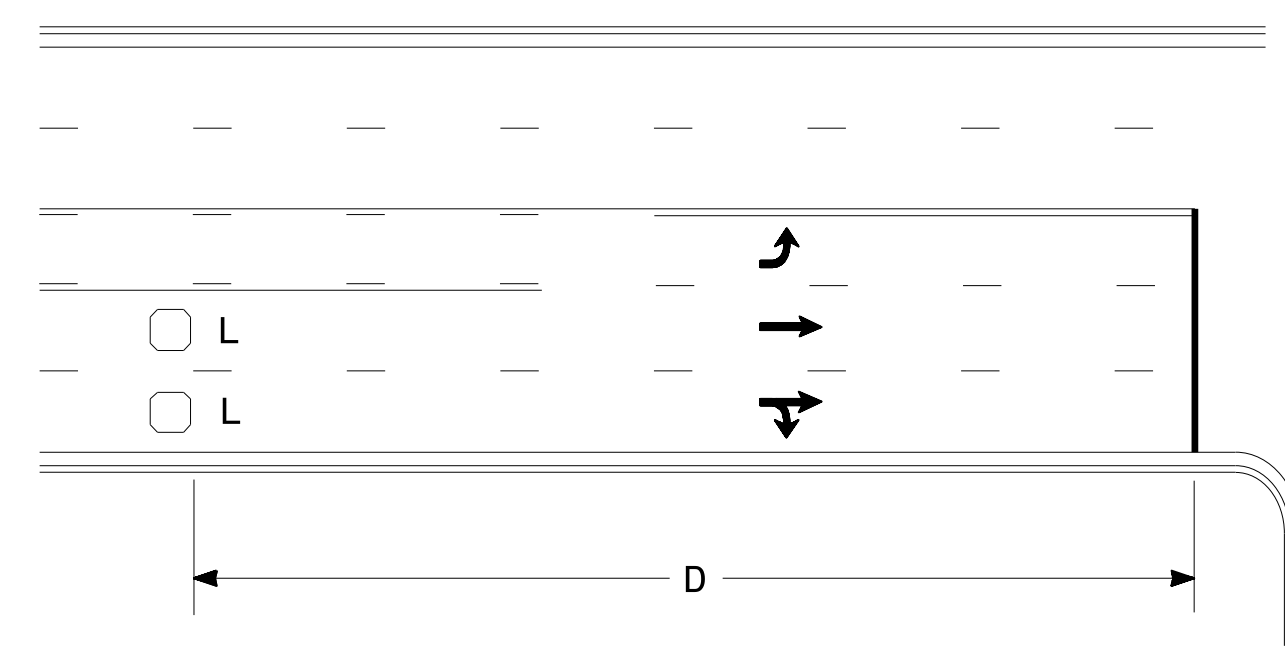
LEGEND

- ┆ STATIONARY SIGN
- ➔ DIRECTION OF TRAFFIC FLOW



**RESURFACING ADVANCE
WARNING SIGNS FOR
URBAN / SUBURBAN
FACILITIES**

High Speed Detection (≥40 mph)

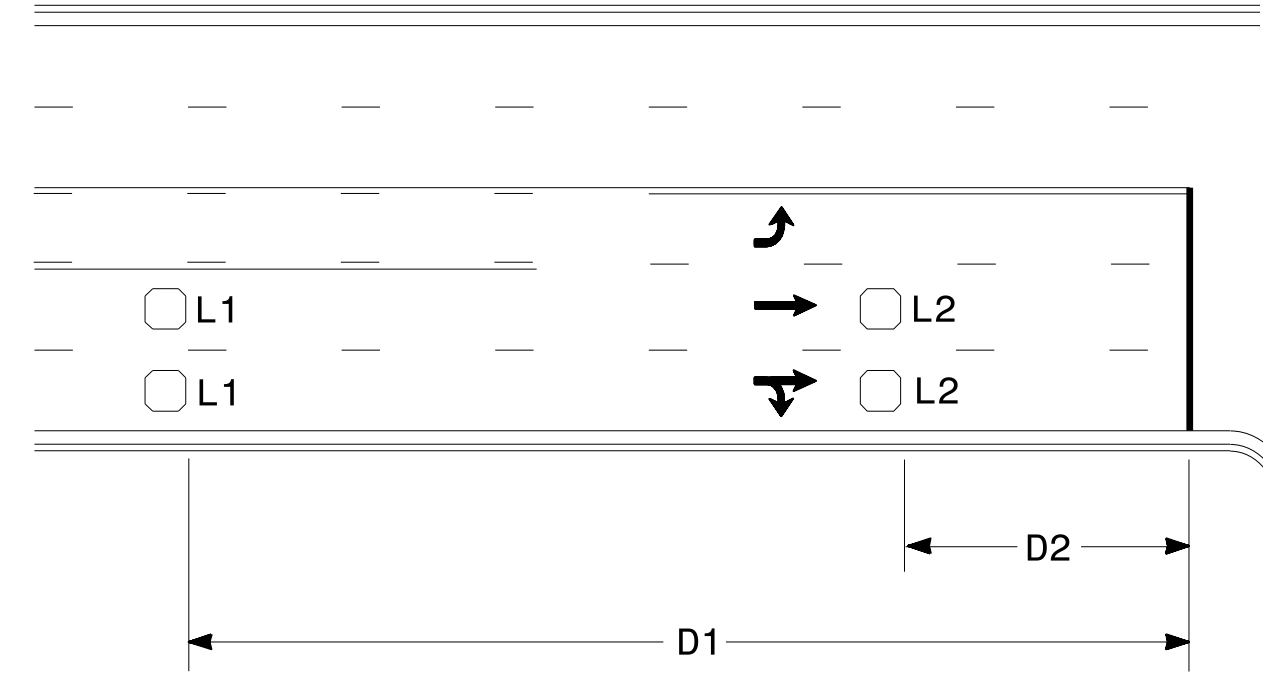


| Speed Limit mph | D ft |
|-----------------|------|
| 40 | 250 |
| 45 | 300 |
| 50 | 355 |
| 55 | 420 |

L = 6ft X 6ft
 Wired in series for TS1
 Controllers
 Wired separately for TS2,
 170, and 2070L Controllers

Volume Density Operation

OR

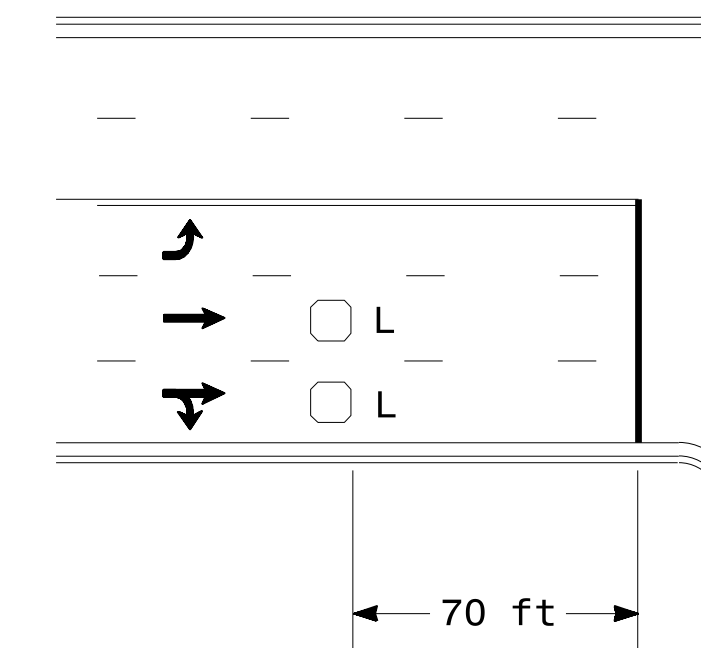


| Speed Limit mph | D1 ft | D2 ft |
|-----------------|-------|-------|
| 40 | 250 | 80 |
| 45 | 300 | 90 |
| 50 | 355 | 100 |
| 55 | 420 | 110 |

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

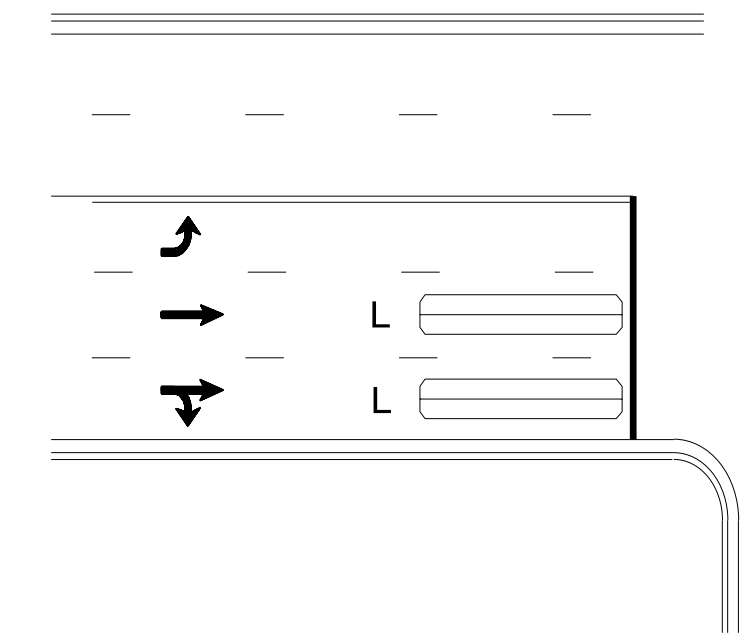
"Stretch" Operation

Low Speed Detection (≤35 mph)



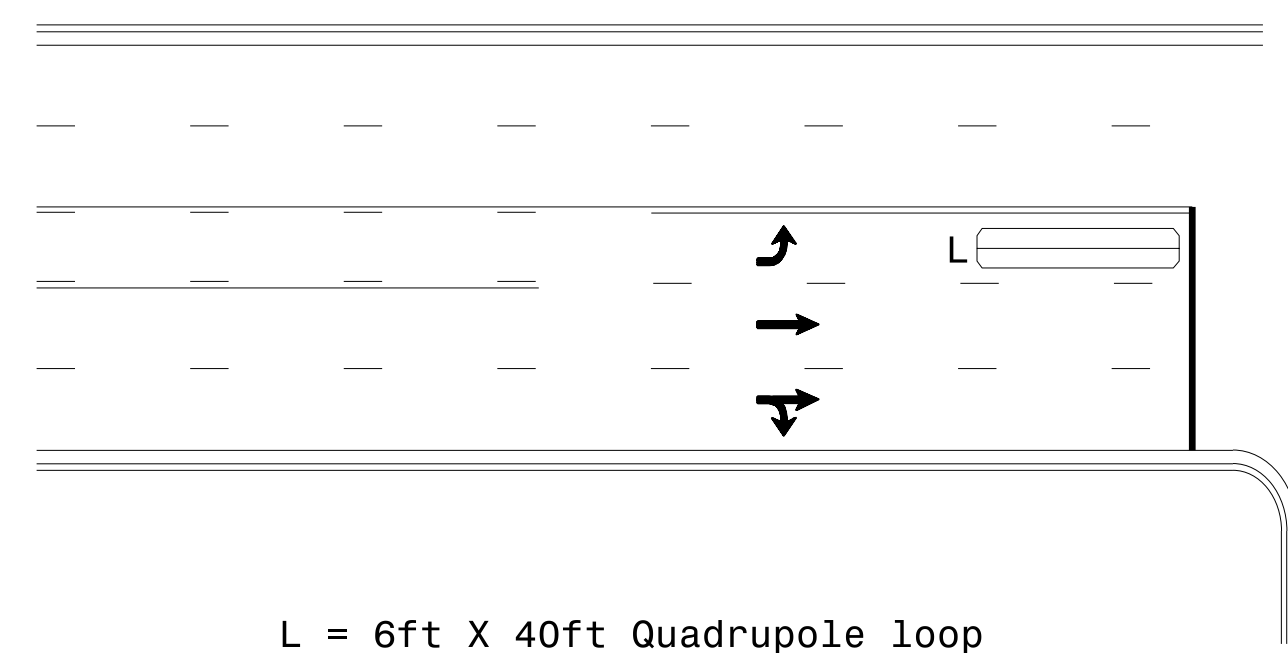
L = 6ft X 6ft
 Wired in series

OR



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

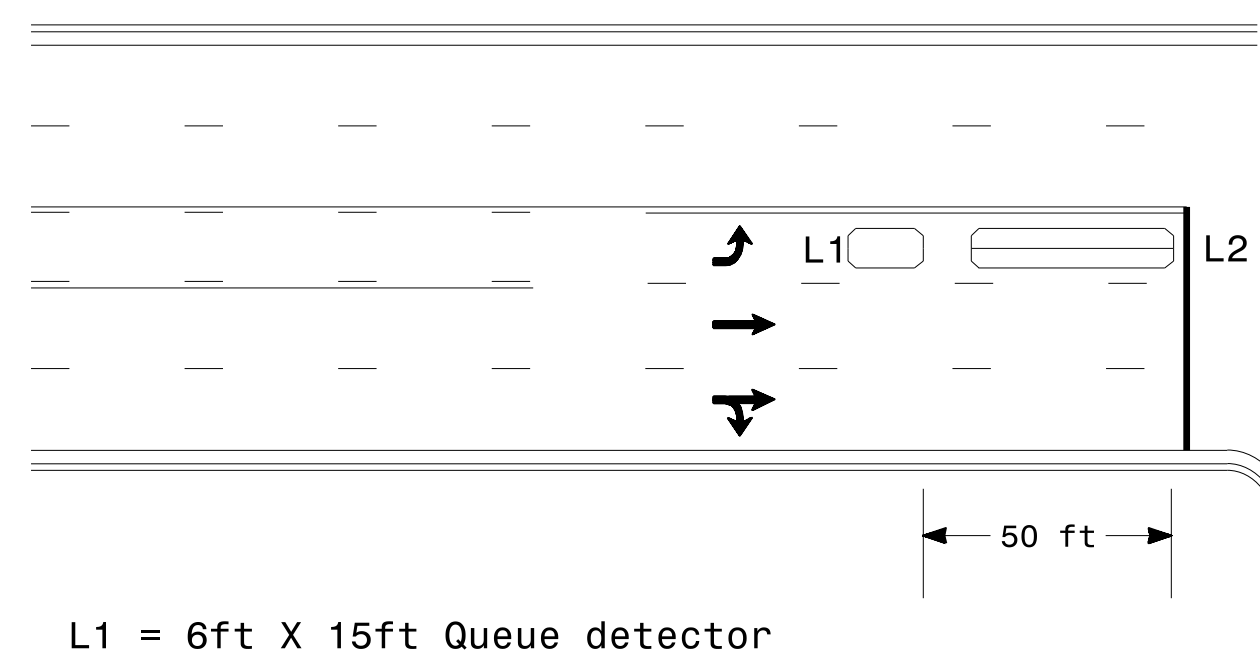
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

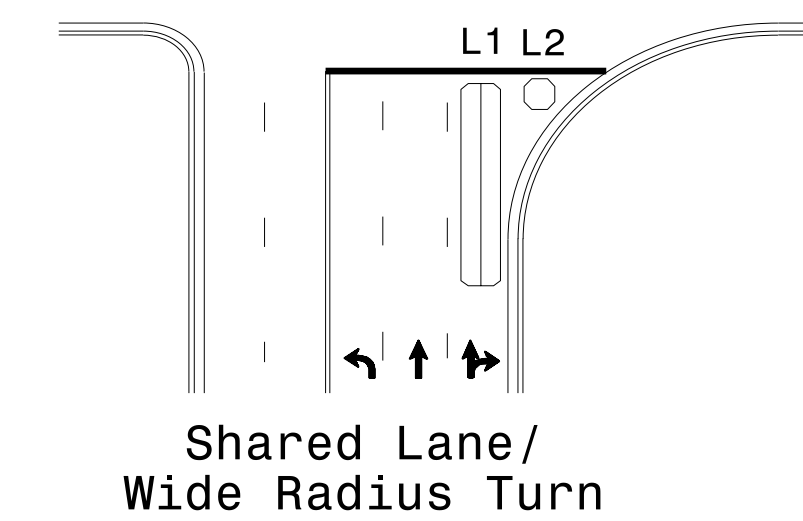
OR



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

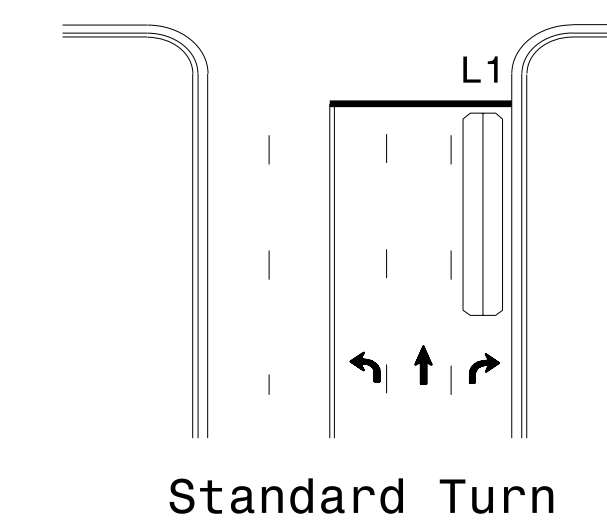
Queue Loop Detection

Right Turn Lane Detection

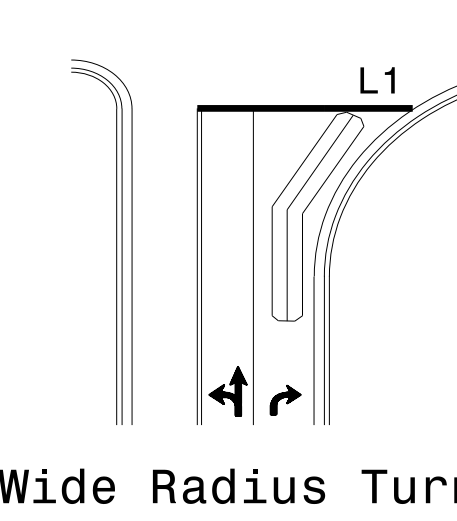


Shared Lane/
 Wide Radius Turn

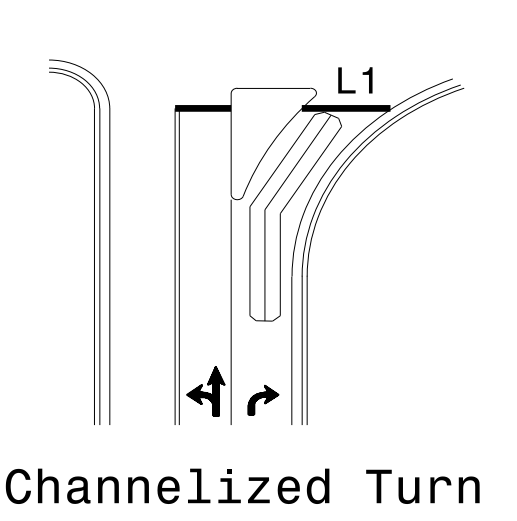
L1 = 6ft X 40ft Quadrupole loop
 L2 = 6ft X 6ft [Minimum] Presence loop
 Wired separately



Standard Turn

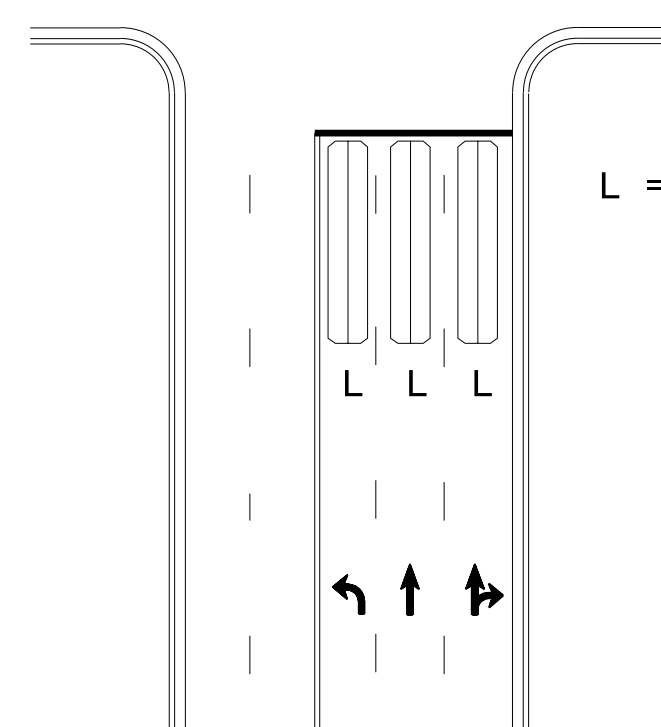


Wide Radius Turn



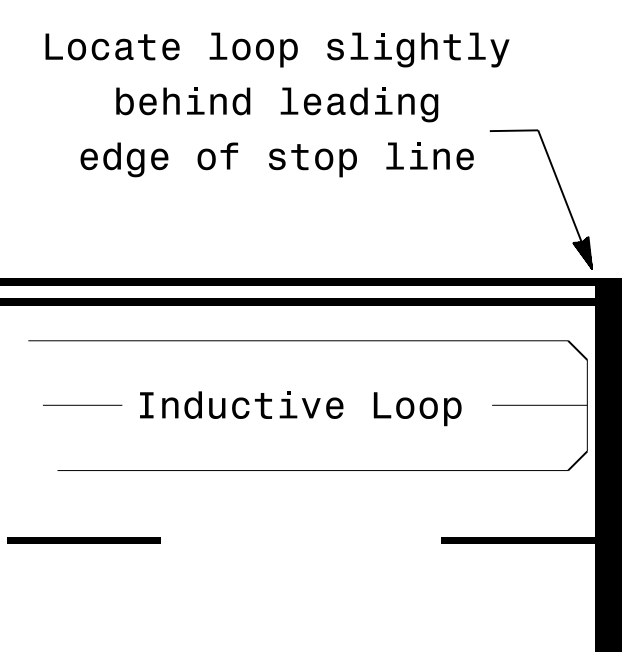
Channelized Turn

Side Street Detection



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

Presence Loop Placement at Stop Lines



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

| | | | |
|-----------|---------------------------------------------|----------------------------------|-----------|
| | Typical Signal Loop Locations | | |
| | PLAN DATE: January 2015 PREPARED BY: PLA | REVIEWED BY: JPG REVIEWED BY: | |
| REVISIONS | | INIT. DATE | 1/30/2015 |

GUIDELINES FOR LANE WIDTHS ON RESURFACING PROJECTS

Contractor shall place the new pavement markings in accordance with this table and detail unless otherwise directed by the Engineer.

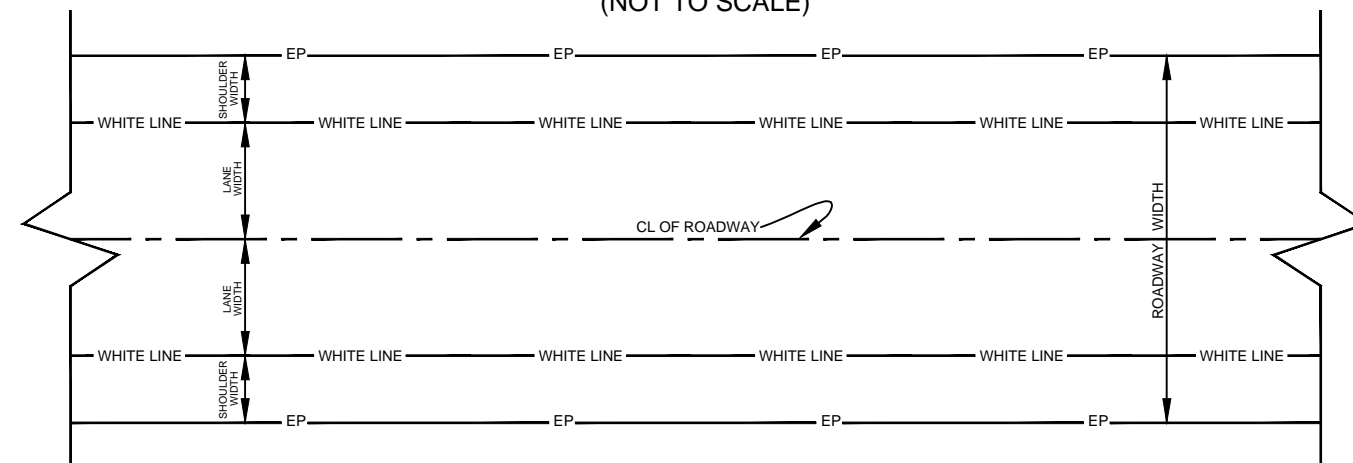
| TWO LANE - TWO WAY ROADWAY - 55 MPH | | |
|--------------------------------------------|------------|----------------|
| ROADWAY WIDTH | LANE WIDTH | SHOULDER WIDTH |
| 18' | 9' * | 0' |
| 20' | 10' * | 0' |
| 22' | 10' | 1' |
| 24' | 10' | 2' |
| 26' | 11' | 2' |
| 28' | 12' | 2' |
| 32' | 12' | 4' |

* May vary due to pavement width

| TWO LANE - TWO WAY ROADWAY 50 MPH OR LESS | | |
|------------------------------------------------------|------------|----------------|
| ROADWAY WIDTH | LANE WIDTH | SHOULDER WIDTH |
| 18' | 9' * | 0' |
| 20' | 10' * | 0' |
| 22' | 10' | 1' |
| 24' | 10' | 2' |
| 26' | 11' | 2' |
| 28' | 11' | 3' |
| 32' | 11' | 5' |

* May vary due to pavement width

SCHEMATIC OF ROADWAY (NOT TO SCALE)



SUMMARY OF QUANTITIES

| | | |
|--------------------------------------|-----------|-----------|
| PROJECT NO. 2017CPT.06.14.10241.1 | SHEET NO. | TOTAL NO. |
|--------------------------------------|-----------|-----------|

| PROJECT | COUNTY | MAP | ROUTE | DESCRIPTION | TYP | LANES | LANE TYPE | FINAL SURFACE TESTING REQUIRED | WARM MIX ASPHALT REQUIRED | LENGTH | WIDTH | 10" MILLING | 1½" MILLING | INCIDENTAL MILLING | BASE COURSE, B25.0B | INTERMEDIATE COURSE, I19.0B | SURFACE COURSE, S9.5B | LEVELING COURSE, S9.5B | ASPHALT BINDER FOR PLANT MIX | PATCHING EXISTING PAVEMENT |
|-------------------------------------------------|----------|-----|--------|---------------------------------------------|-----|-------|-----------|--------------------------------|---------------------------|-------------|-------|--------------|---------------|--------------------|---------------------|-----------------------------|-----------------------|------------------------|------------------------------|----------------------------|
| NO | | NO | | | NO | | | | | MI | FT | SY | SY | SY | TONS | TONS | TONS | TONS | TONS | TONS |
| 2017CPT.06.14.10241.1 | Columbus | 1 | NC 410 | FROM US 74 BUSINESS TO SECOND AVE. | 1 | 3 | MU | NO | NO | 0.5 | 31 | 3,254 | 9,038 | 1,000 | 1,225 | 800 | 900 | 5 | 147 | 25 |
| TOTAL FOR MAP NO. 1 | | | | | | | | | | 0.5 | | 3,254 | 9,038 | 1,000 | 1,225 | 800 | 900 | 5 | 147 | 25 |
| 2017CPT.06.14.10241.1 | Columbus | 2 | NC 410 | FROM SECOND AVE. TO RAILROAD AVE. | 2 | 2 | 2WU | NO | NO | 0.15 | 31 | | 2,804 | 317 | | | 300 | 5 | 18 | 18 |
| TOTAL FOR MAP NO. 2 | | | | | | | | | | 0.15 | | | 2,804 | 317 | | | 300 | 5 | 18 | 18 |
| 2017CPT.06.14.10241.1 | Columbus | 3 | NC 410 | FROM RAILROAD AVE TO END C&G NEAR SMITH ST. | 1 | 2 | MU | NO | NO | 0.38 | 31 | 3,130 | 6,930 | 500 | 1,450 | 950 | 646 | 5 | 148 | 25 |
| TOTAL FOR MAP NO. 3 | | | | | | | | | | 0.38 | | 3,130 | 6,930 | 500 | 1,450 | 950 | 646 | 5 | 148 | 25 |
| TOTAL FOR PROJ NO. 2017CPT.06.14.10241.1 | | | | | | | | | | 1.03 | | 6,384 | 18,772 | 1,817 | 2,675 | 1,750 | 1,846 | 15 | 313 | 68 |
| GRAND TOTAL | | | | | | | | | | 1.03 | | 6,384 | 18,772 | 1,817 | 2,675 | 1,750 | 1,846 | 15 | 313 | 68 |

| PROJECT | COUNTY | MAP | ROUTE | DESCRIPTION | TYP | LANES | LANE TYPE | FINAL SURFACE TESTING REQUIRED | WARM MIX ASPHALT REQUIRED | LENGTH | WIDTH | ADJ. OF MANHOLES | ADJ. OF METER OR VALVE BOX | PAVED TRENCHING (1 CONDUIT, 2") | UNPAVED TRENCHING (1 CONDUIT, 2") | JUNCTION BOX (STANDARD SIZE) | JUNCTION BOX (OVER-SIZED, HEAVY DUTY) | 2" RISER WITH WEATHERHEAD | INDUCTIVE LOOP SAWCUT | LEAD-IN CABLE (14-2) | |
|-------------------------------------------------|----------|-----|--------|---------------------------------------------|-----|-------|-----------|--------------------------------|---------------------------|-------------|-------|------------------|----------------------------|---------------------------------|-----------------------------------|------------------------------|---------------------------------------|---------------------------|-----------------------|----------------------|--|
| NO | | NO | | | NO | | | | | MI | FT | EA | EA | LF | LF | EA | EA | EA | LF | LF | |
| 2017CPT.06.14.10241.1 | Columbus | 1 | NC 410 | FROM US 74 BUSINESS TO SECOND AVE. | 1 | 3 | MU | NO | NO | 0.5 | 31 | 5 | 10 | | | | | | | | |
| TOTAL FOR MAP NO. 1 | | | | | | | | | | 0.5 | | 5 | 10 | | | | | | | | |
| 2017CPT.06.14.10241.1 | Columbus | 2 | NC 410 | FROM SECOND AVE. TO RAILROAD AVE. | 2 | 2 | 2WU | NO | NO | 0.15 | 31 | 2 | 2 | 100 | 100 | 1 | 1 | 1 | 325 | 100 | |
| TOTAL FOR MAP NO. 2 | | | | | | | | | | 0.15 | | 2 | 2 | 100 | 100 | 1 | 1 | 1 | 325 | 100 | |
| 2017CPT.06.14.10241.1 | Columbus | 3 | NC 410 | FROM RAILROAD AVE TO END C&G NEAR SMITH ST. | 1 | 2 | MU | NO | NO | 0.38 | 31 | 5 | 10 | | | | | | | | |
| TOTAL FOR MAP NO. 3 | | | | | | | | | | 0.38 | | 5 | 10 | | | | | | | | |
| TOTAL FOR PROJ NO. 2017CPT.06.14.10241.1 | | | | | | | | | | 1.03 | | 12 | 22 | 100 | 100 | 1 | 1 | 1 | 325 | 100 | |
| GRAND TOTAL | | | | | | | | | | 1.03 | | 12 | 22 | 100 | 100 | 1 | 1 | 1 | 325 | 100 | |

THERMOPLASTIC AND PAINT QUANTITIES

| PROJECT NO. | SHEET NO. |
|-----------------------|-----------|
| 2017CPT.06.14.10241.1 | |

| PROJECT NO | COUNTY | MAP NO | ROUTE | DESCRIPTION | TYP | LANES | LANE TYPE | LENGTH | WIDTH | 4413000000-E | 4457000000-N | 4510000000-N | 4685000000-E | 4686000000-E | | 4700000000-E |
|-------------------------------------------------|----------|--------|--------|---------------------------------------------|-----|-------|-----------|--------|-------------|-------------------------------------------|---------------------------|-----------------|------------------------|-------------------------|--------------------------|-------------------------|
| | | | | | | | | | | WORK ZONE ADVANCE/GENERAL WARNING SIGNING | TEMPORARY TRAFFIC CONTROL | LAW ENFORCEMENT | 4" X 90 M WHITE THERMO | 4" X 120 M WHITE THERMO | 4" X 120 M YELLOW THERMO | 12" X 90 M WHITE THERMO |
| NO | | NO | | | NO | | | | | SF | LS | HR | LF | LF | LF | LF |
| 2017CPT.06.14.10241.1 | Columbus | 1 | NC 410 | FROM US 74 BUSINESS TO SECOND AVE. | 1 | 3 | MU | 0.5 | 31 | 126 | 1 | 80 | | 100 | 6,500 | 300 |
| TOTAL FOR MAP NO. 1 | | | | | | | | | 0.5 | 126 | 1 | 80 | 100 | 6,500 | 300 | |
| 2017CPT.06.14.10241.1 | Columbus | 2 | NC 410 | FROM SECOND AVE. TO RAILROAD AVE. | 2 | 2 | 2WU | 0.15 | 31 | | | | 200 | 20 | 3,500 | 300 |
| TOTAL FOR MAP NO. 2 | | | | | | | | | 0.15 | | | | 200 | 20 | 3,500 | 300 |
| 2017CPT.06.14.10241.1 | Columbus | 3 | NC 410 | FROM RAILROAD AVE TO END C&G NEAR SMITH ST. | 1 | 2 | MU | 0.38 | 31 | | | | | 100 | 8,669 | |
| TOTAL FOR MAP NO. 3 | | | | | | | | | 0.38 | | | | 100 | 8,669 | | |
| TOTAL FOR PROJ NO. 2017CPT.06.14.10241.1 | | | | | | | | | 1.03 | 126 | 1 | 80 | 200 | 220 | 18,669 | 600 |
| GRAND TOTAL | | | | | | | | | 1.03 | 126 | 1 | 80 | 200 | 220 | 18,669 | 600 |

| PROJECT NO | COUNTY | MAP NO | ROUTE | DESCRIPTION | TYP | LANES | LANE TYPE | LENGTH | WIDTH | 4705000000-E | 4710000000-E | 4721000000-E | 4725000000-E | | 4810000000-E | |
|-------------------------------------------------|----------|--------|--------|---------------------------------------------|-----|-------|-----------|--------|-------------|--------------------------|--------------------------|------------------|----------------------|-----------------------|----------------|-----------------|
| | | | | | | | | | | 16" X 120 M WHITE THERMO | 24" X 120 M WHITE THERMO | THERMO RXR 120 M | THERMO LT ARROW 90 M | THERMO STR ARROW 90 M | 4" WHITE PAINT | 4" YELLOW PAINT |
| NO | | NO | | | NO | | | | | LF | LF | EA | EA | EA | LF | LF |
| 2017CPT.06.14.10241.1 | Columbus | 1 | NC 410 | FROM US 74 BUSINESS TO SECOND AVE. | 1 | 3 | MU | 0.5 | 31 | | 100 | | 13 | 2 | 100 | 6,500 |
| TOTAL FOR MAP NO. 1 | | | | | | | | | 0.5 | 100 | | 13 | 2 | 100 | 6,500 | |
| 2017CPT.06.14.10241.1 | Columbus | 2 | NC 410 | FROM SECOND AVE. TO RAILROAD AVE. | 2 | 2 | 2WU | 0.15 | 31 | 190 | 50 | 2 | 7 | | 220 | 3,500 |
| TOTAL FOR MAP NO. 2 | | | | | | | | | 0.15 | 190 | 50 | 2 | 7 | 220 | 3,500 | |
| 2017CPT.06.14.10241.1 | Columbus | 3 | NC 410 | FROM RAILROAD AVE TO END C&G NEAR SMITH ST. | 1 | 2 | MU | 0.38 | 31 | | 24 | | 6 | | 100 | 8,669 |
| TOTAL FOR MAP NO. 3 | | | | | | | | | 0.38 | | 24 | | 6 | 100 | 8,669 | |
| TOTAL FOR PROJ NO. 2017CPT.06.14.10241.1 | | | | | | | | | 1.03 | 190 | 174 | 2 | 26 | 2 | 420 | 18,669 |
| GRAND TOTAL | | | | | | | | | 1.03 | 190 | 174 | 2 | 26 | 2 | 420 | 18,669 |

| PROJECT NO | COUNTY | MAP NO | ROUTE | DESCRIPTION | TYP | LANES | LANE TYPE | LENGTH | WIDTH | 4825000000-E | 4830000000-E | 4835000000-E | 4840000000-N | 4845000000-N | | 4900000000-N | |
|-------------------------------------------------|----------|--------|--------|---------------------------------------------|-----|-------|-----------|--------|-------------|-----------------|-----------------|-----------------|---------------|----------------|-----------------|-----------------------|-------------------------|
| | | | | | | | | | | 12" WHITE PAINT | 16" WHITE PAINT | 24" WHITE PAINT | PAINT MSG RXR | PAINT LT ARROW | PAINT STR ARROW | CRYSTAL & RED MARKERS | YELLOW & YELLOW MARKERS |
| NO | | NO | | | NO | | | | | LF | LF | LF | EA | EA | EA | EA | EA |
| 2017CPT.06.14.10241.1 | Columbus | 1 | NC 410 | FROM US 74 BUSINESS TO SECOND AVE. | 1 | 3 | MU | 0.5 | 31 | 300 | | 100 | | 13 | 2 | 5 | 80 |
| TOTAL FOR MAP NO. 1 | | | | | | | | | 0.5 | 300 | | 100 | | 13 | 2 | 5 | 80 |
| 2017CPT.06.14.10241.1 | Columbus | 2 | NC 410 | FROM SECOND AVE. TO RAILROAD AVE. | 2 | 2 | 2WU | 0.15 | 31 | 300 | 290 | 99 | 2 | 7 | | 5 | 40 |
| TOTAL FOR MAP NO. 2 | | | | | | | | | 0.15 | 300 | 290 | 99 | 2 | 7 | 5 | 40 | |
| 2017CPT.06.14.10241.1 | Columbus | 3 | NC 410 | FROM RAILROAD AVE TO END C&G NEAR SMITH ST. | 1 | 2 | MU | 0.38 | 31 | | | 24 | | 6 | | 5 | 42 |
| TOTAL FOR MAP NO. 3 | | | | | | | | | 0.38 | | | 24 | | 6 | 5 | 42 | |
| TOTAL FOR PROJ NO. 2017CPT.06.14.10241.1 | | | | | | | | | 1.03 | 600 | 290 | 223 | 2 | 26 | 2 | 15 | 162 |
| GRAND TOTAL | | | | | | | | | 1.03 | 600 | 290 | 223 | 2 | 26 | 2 | 15 | 162 |