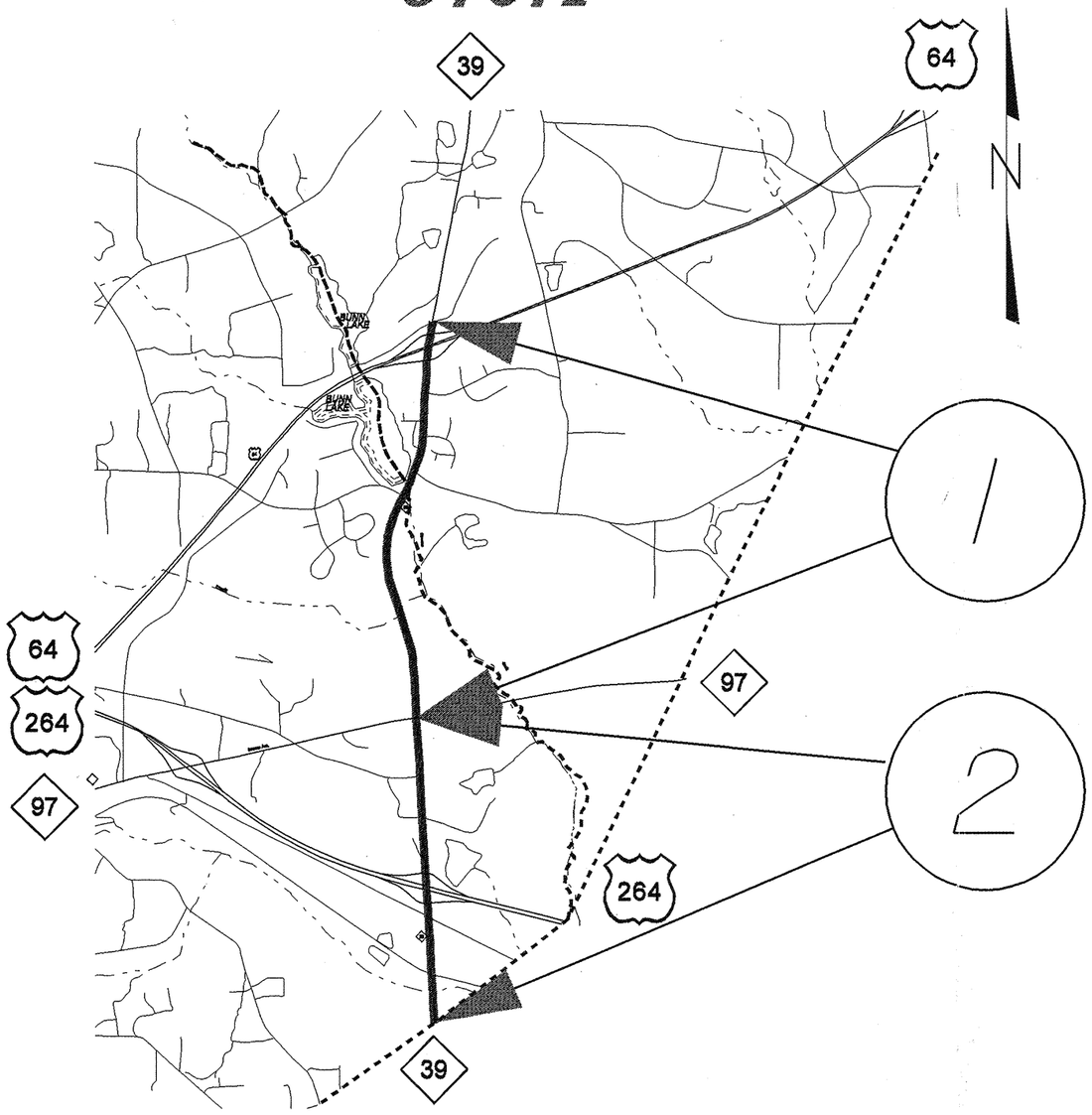
MA05025R
37671

WBS ELEMENT	SHEET NO.	TOTAL SHEETS
37671	1	
MA05025R		



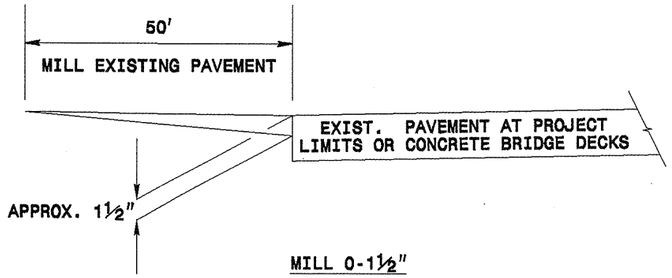
Franklin and Wake Counties

WBS ELEMENT	SHEET NO.	TOTAL SHEETS
37671	2	

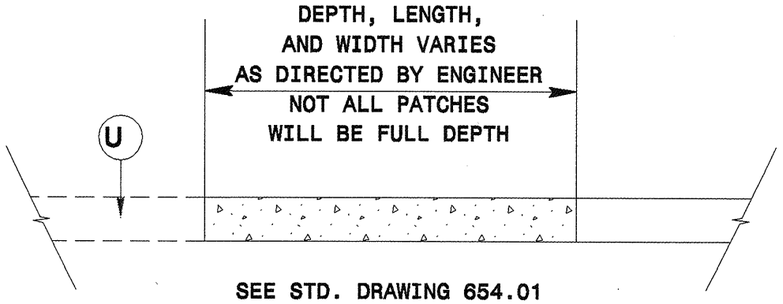
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
MA05025R		

NOTES

ALL UNPAVED S.R. ROADS TO BE RESURFACED 50′ FROM EDGE OF PAVEMENT OF MAIN PROJECT
ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII, OR AS DIRECTED BY THE ENGINEER.
EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.



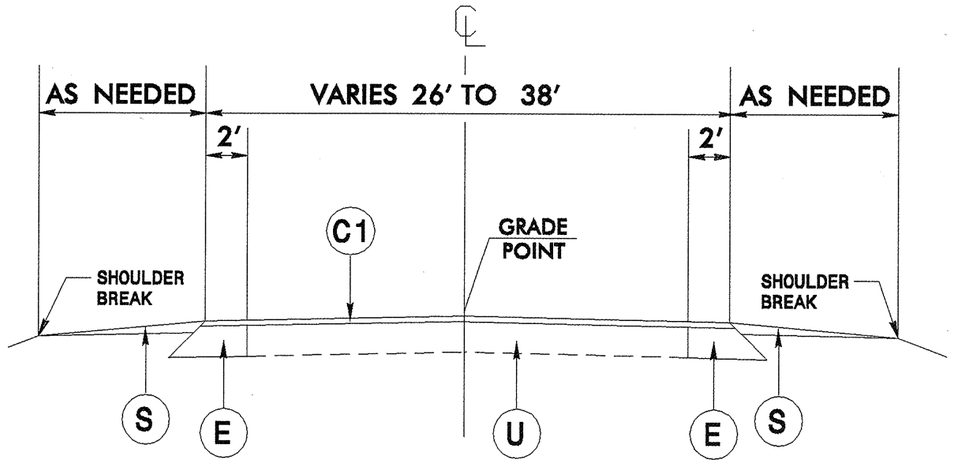
MILL 0-1½″



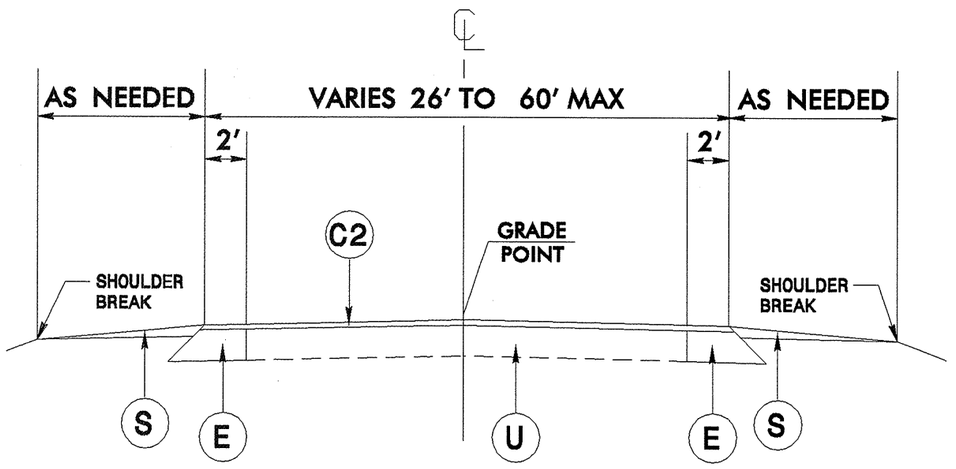
SEE STD. DRAWING 654.01
PATCHING EXISTING PAVEMENT

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
E	PROP. APPROX. 8.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
U	EXISTING PAVEMENT.
S	SHOULDER RECONSTRUCTION.



TYPICAL NO. 1



TYPICAL NO. 2

WBS ELEMENT	SHEET NO.	TOTAL NO.
37671	3	
MA05025R		

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LENGTH MI	WIDTH FT	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	SURFACE COURSE, S9.5B TONS	PG 64-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	GUARDRAIL ANCHOR UNIT - TYPE 350 EA	SEED & MULCHING AC	INDUCTIVE LOOP LF
37671	Franklin Wake	1	NC 39	FROM 500' NORTH OF THE US 64 RAMPS IN FRANKLIN COUNTY TO NC 97 IN WAKE COUNTY	1	2.25	26 - 38	113	4.5	1,600	3,090	6,403	517	900	9.00	3.38	1,200
	Wake	2	NC 39	NC 97 TO JOHNSTON COUNTY LINE	2	1.6	26 - 60	50	3.2	1,400	6,478	3,054	462	300	8.00	1.60	
TOTAL FOR PROJ NO. 37671						**3.85**		**163**	**7.7**	**3,000**	**9,568**	**9,457**	**979**	**1,200**	**17.00**	**4.98**	**1,200**
GRAND TOTAL						**3.85**		**163**	**7.7**	**3,000**	**9,568**	**9,457**	**979**	**1,200**	**17.00**	**4.98**	**1,200**

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4685000000-E	4686000000-E		4695000000-E	4705000000-E	4710000000-E	4721000000-E		4725000000-E		4810000000-E	4900000000-N	4900000000-N
					4" X 90 M WHITE THERMO LF	4" X 120 M YELLOW THERMO LF	4" X 120 M WHITE THERMO LF	8" X 90 M YELLOW THERMO LF	16" X 120 M WHITE THERMO LF	24" X 120 M WHITE THERMO LF	THERMO RXR 120 M EA	THERMO MSG ONLY 120 M EA	THERMO LT ARROW 90 M EA	THERMO RT ARROW 90 M EA	4" YELLOW PAINT LF	YELLOW & YELLOW MARKERS EA	CRYSTAL & RED MARKERS EA
37671	Franklin Wake	1	NC 39	FROM 500' NORTH OF THE US 64 RAMPS IN FRANKLIN COUNTY TO NC 97 IN WAKE COUNTY	24,210	23,760									47,520	149	
	Wake	2	NC 39	NC 97 TO JOHNSTON COUNTY LINE	17,216	16,896	1,000	1,000	100	250	4	8	12	6		106	100
TOTAL FOR PROJ NO. 37671					**41,426**	**40,656**	**1,000**	**1,000**	**100**	**250**	**4**	**8**	**12**	**6**	**47,520**	**255**	**100**
						41,656					**12**		**18**			**355**	
GRAND TOTAL					**41,426**	**40,656**	**1,000**	**1,000**	**100**	**250**	**4**	**8**	**12**	**6**	**47,520**	**255**	**100**
						41,656					**12**		**18**			**355**	

PROJ. REFERENCE NO.	SHEET NO.
37671	TCP-1

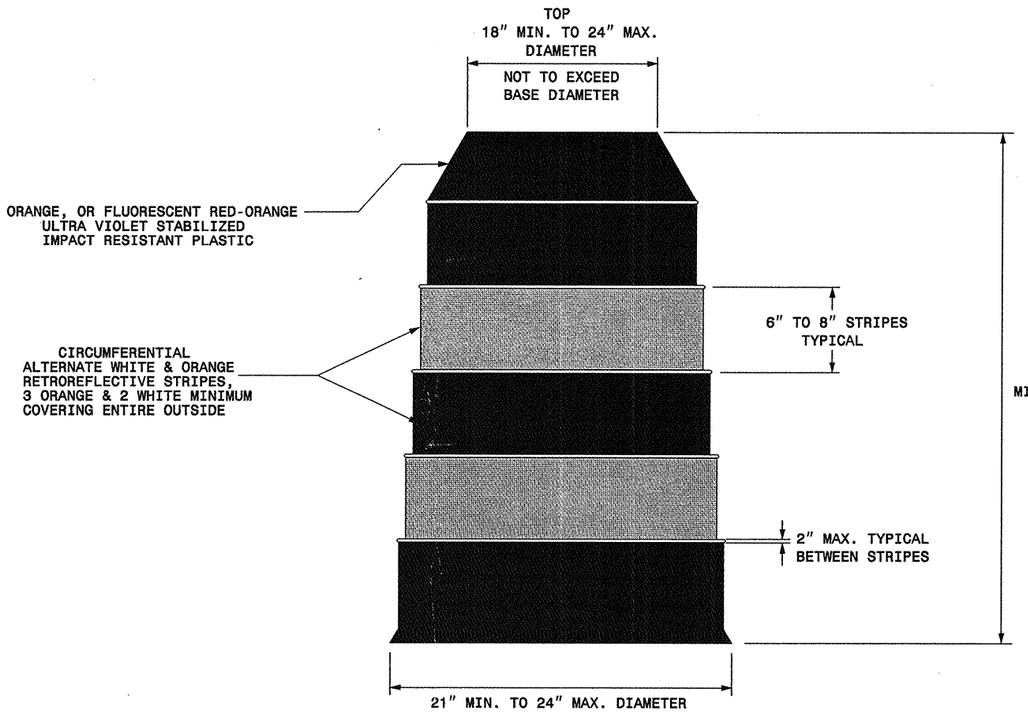
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

DRUMS

SHEET 1 OF 1

1130D01



GENERAL NOTES

-BALLASTING SHALL BE ACHIEVED BY THE SAND BAG, TIRE-SIDEWALL BALLAST, OR PREFORMED WEIGHTED BASE BALLASTING METHODS. DO NOT PLACE BALLAST ON TOP OF THE DRUM.

-IF NECESSARY PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-RETROREFLECTIVE DRUM SURFACES. SHOW THE LETTERS AND NUMBERS USING A NON-RETROREFLECTIVE COLOR AND NOT OVER 2" IN HEIGHT.

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

ENGLISH STANDARD DRAWING FOR

DRUMS

SHEET 1 OF 1

1130D01

APPROVED:_____ DATE:_____

SEAL

REPLACEMENT DETAIL FOR RSD 1130.01

SCALE:	NONE
DATE:	4/02
DWG. BY:	MMM
DESIGN BY:	MMM
REVIEWED BY:	MMM

REVISIONS	
11/02	

CADD FILE

07-APR-2006 09:13
\\DOT\DFSROOT01\GROUPS-WZTCCC\designgroup4\squad4a\resurfacing\div05\37669etcwakefranklin\3767\3767ltcpldrums_englishn030405.dgn
dseymore AT WZTC206427

PROJ. REFERENCE NO.	SHEET NO.
37671	TCP- 2

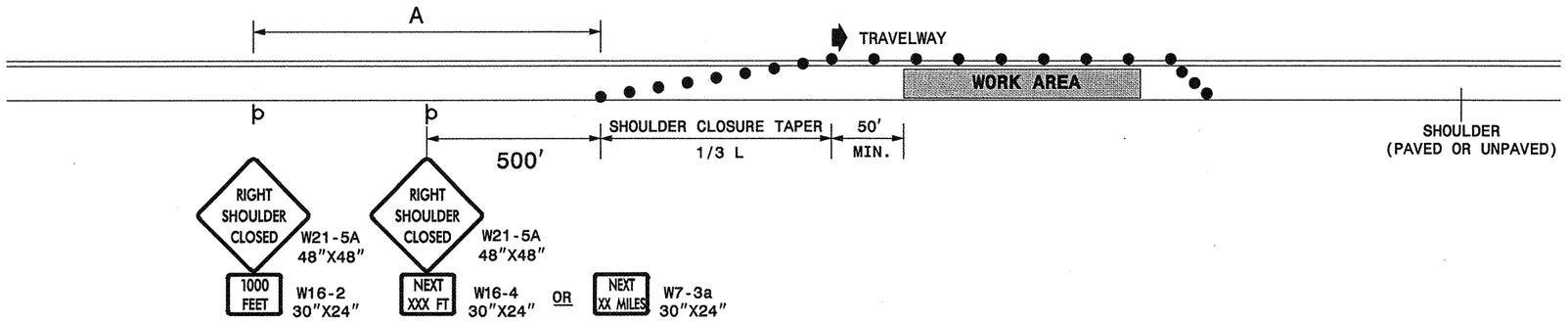
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-05

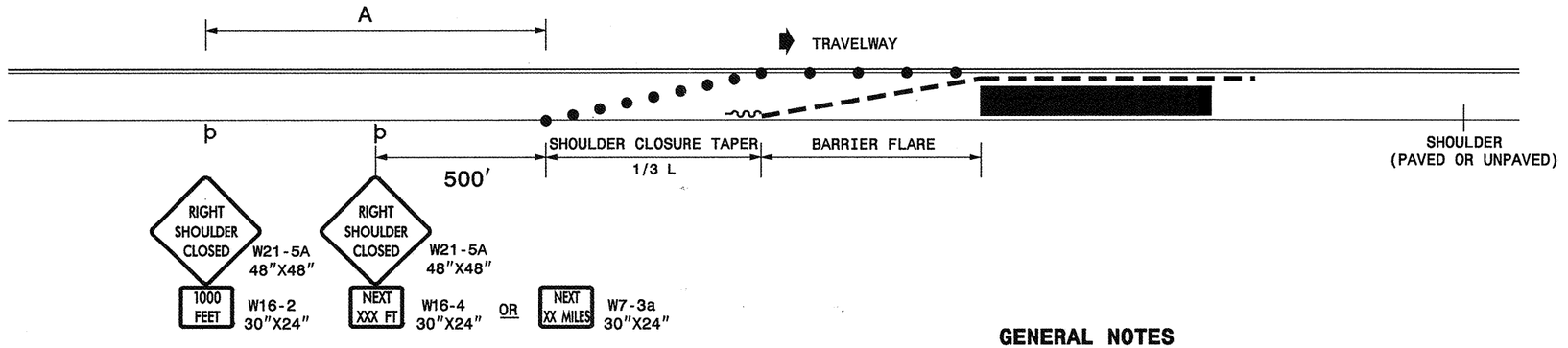
ENGLISH STANDARD DRAWING FOR

TEMPORARY SHOULDER CLOSURES

SHOULDER CLOSURES UTILIZING DRUMS



SHOULDER CLOSURES UTILIZING TEMPORARY BARRIER



LEGEND

- TEMPORARY CRASH CUSHION
- PORTABLE CONCRETE BARRIER
- DRUM
- STATIONARY OR PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

GENERAL NOTES

-PLACE SHOULDER CLOSURE SIGNS ON THE SAME SIDE AS THE SHOULDER THAT IS CLOSED.

-PLACE DRUMS IN THE SHOULDER TAPER AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE WORK AREA AND BARRIER FLARE IS EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

-FLARE THE APPROACH END OF PORTABLE CONCRETE BARRIER BEYOND THE SHOULDER AND USE A CRASH CUSHION FOR PROTECTION IF THE EXPOSED END OF THE BARRIER IS WITHIN THE "CLEAR ZONE".

-USE STATIONARY SIGNS FOR LONG TERM OPERATIONS (LONGER THAN 3 DAYS).

-REFER TO STD. 1101.11 SHEETS 1, 3, & 4, FOR "L" DISTANCE, BARRIER FLARE RATES, AND SIGN SPACING.

SHEET 1 OF 1

1101D04

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

1-05

ENGLISH STANDARD DRAWING FOR

TEMPORARY SHOULDER CLOSURES

SHEET 1 OF 1

1101D04

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029904 ENGINEER JASON P. GALLOWAY

REPLACEMENT DETAIL FOR RSD 1101.04

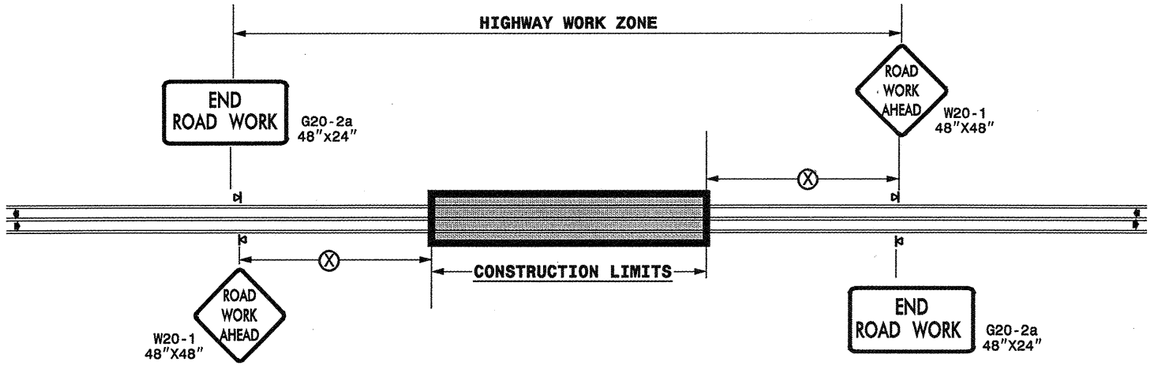
SCALE:	NONE
DATE:	11/04
DWG. BY:	PS
DESIGN BY:	JPG
REVIEWED BY:	MMM

REVISIONS	
08/05	
CADD FILE	

07-APR-2006 09:14
\\DOT\DFSROOT01\GROUPS-WZTCCC\designgroup4\squadda\resurfacing\div05\37669etowakefranklin\37671\tcp2shoulderclosures05.dgn
psaymore AT WZTC206427

PROJ. REFERENCE NO.	SHEET NO.
37671	TCP-3

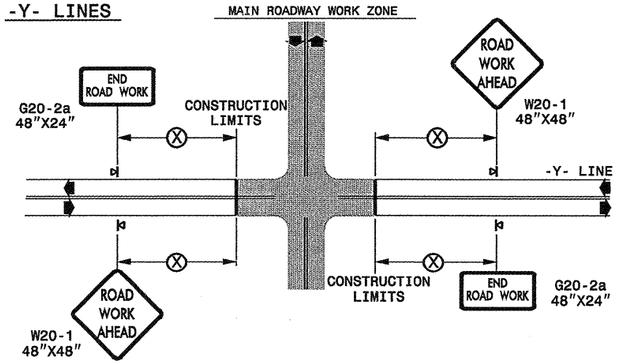
TWO-WAY UNDIVIDED ** (L-LINES)



POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING (X)
≤ 50	500′
≥ 55	1000′

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

ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)



GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH PORTABLE WORK ZONE SIGN STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER. PORTABLE WORK ZONE SIGNS MAY BE ROLL UP OR APPROVED COMPOSITE.
- PROVIDE PORTABLE WORK ZONE SIGN STANDS, PORTABLE SIGNS AND SIGN SHEETING WHICH ARE LISTED ON THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCT LIST OR ACCEPTED AS TRAFFIC QUALIFIED BY THE TRAFFIC CONTROL UNIT.
- ** TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND

PORTABLE SIGN

DIRECTION OF TRAFFIC FLOW

DETAIL DRAWING
FOR TWO-WAY UNDIVIDED
WORK ZONE WARNING SIGNS

SHEET 1 OF 1

APPROVED:_____ DATE:_____

SEAL

DETAIL DRAWING
FOR TWO-WAY UNDIVIDED
ADVANCED WORK ZONE WARNING SIGNS

SCALE: NONE	REVISIONS	
DATE:	7-98	10/01
DWG. BY:	10-98	03/04
DESIGN BY:	01/01	11/04
REVIEWED BY:	CADD FILE	

07-APR-2006 09:14
\\DOT\DFSROOT01\GROUPS-WZTCCC\designgroup4\squad4a\resurfacing\dlv05\37669etowakefranklin\37671\37672wayundivurbfrwysrev05.dgn
pseymore AT WZTC206427

TWO LANE, TWO WAY WORK ZONE (L-LINES)

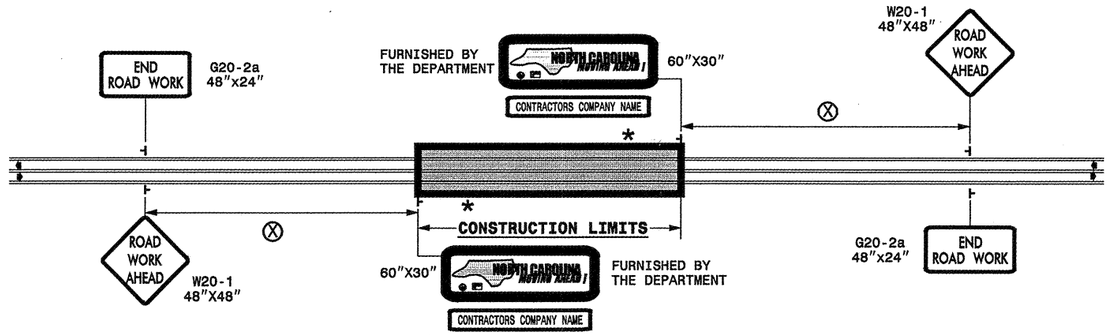
FURNISHED BY THE DEPARTMENT

NORTH CAROLINA MOVING AHEAD !

60"X30"

CONTRACTORS COMPANY NAME

60" Max. X 12"



POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING Ⓧ
P.S.L. ≤ 50	350'
P.S.L. ≥ 55	500'

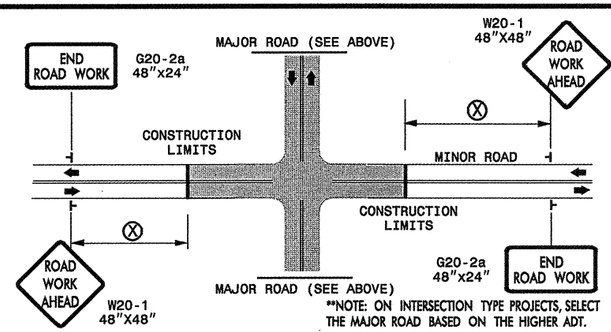
* ROAD WORK NEXT XX MILES G20-1A 60"X24"

THIS SIGN TO BE USED ON PROJECTS LONGER THAN 2 MILES

THE NUMBER DISPLAYED ON THE SIGN IS TO BE A WHOLE NUMBER ROUNDED UP TO THE NEXT MILE

IT'S TO BE LOCATED 1,500 FEET INSIDE OF THE CONSTRUCTION LIMITS

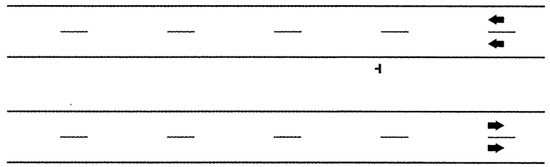
INTERSECTIONS (-Y- LINES)



FREEWAYS/INTERSTATES

DUAL MOUNT "ROAD WORK AHEAD" SIGNS 1,000' IN ADVANCE OF PROJECT LIMITS

DUAL MOUNT "MOVING AHEAD" SIGNS 500' IN ADVANCE OF PROJECT LIMITS



GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED. USE PORTABLE WORK ZONE SIGNS ONLY WITH PORTABLE WORK ZONE SIGN STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER. PORTABLE WORK ZONE SIGNS MAY BE ROLL UP OR APPROVED COMPOSITE.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01. REMOVE ENTIRE POST WHEN REMOVING SIGNS WITH SPLICED POSTS.
- DO NOT BACK BRACE SIGN SUPPORTS.

LEGEND

⊢ STATIONARY SIGN

DIRECTION OF TRAFFIC FLOW

PROJ. REFERENCE NO.	SHEET NO.
37671	NCMA-1

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

DETAIL DRAWING FOR ADVANCE WARNING WORK ZONE SIGNS

SHEET 1 OF 1

APPROVED:_____ DATE:_____

SEAL

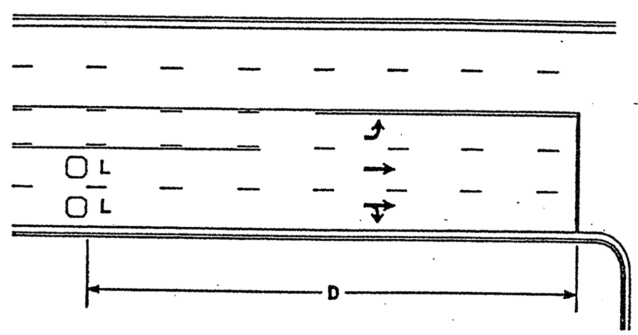
ADVANCE WARNING WORK ZONE SIGNS FOR "MOVING AHEAD"

SCALE:	NONE
DATE:	07/03
DWG. BY:	JSK
DESIGN BY:	JSK
REVIEWED BY:	SK

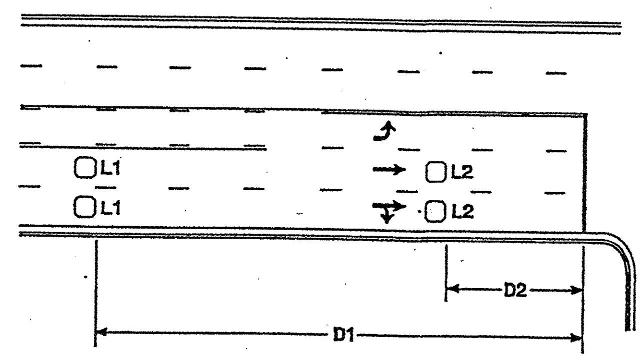
REVISIONS	
11/04	
12/04	
CADD FILE	

PROJECT REFERENCE NO.	SHEET NO.
	SIG 1

High Speed Detection
[≥40 mph (64 km/hr)]



OR



Speed Limit mph (km/hr)		D ft	(m)
40	(64)	250	(75)
45	(72)	300	(90)
50	(80)	355	(110)
55	(88)	420	(130)

L = 6ft X 6ft (1.8m X 1.8m)
Wired in series for TS1 Controllers
Wired separately for TS2, 170, and 2070L Controllers

Volume Density Operation

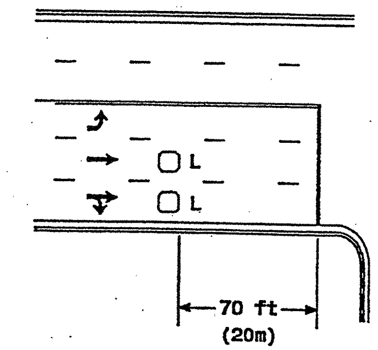
Speed Limit mph (km/hr)		D1 ft	(m)	D2 ft	(m)
40	(64)	250	(75)	80	(25)
45	(72)	300	(90)	90	(27)
50	(80)	355	(110)	100	(30)
55	(88)	420	(130)	110	(35)

L1 = 6ft X 6ft (1.8m X 1.8m) Wired in series

L2 = 6ft X 6ft (1.8m X 1.8m) Wired in series

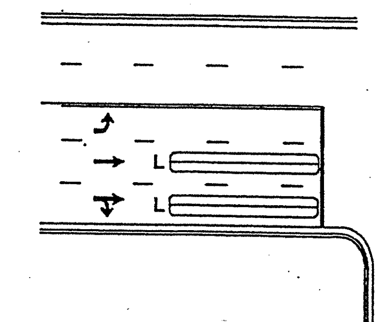
"Stretch" Operation

Low Speed Detection
[≤35 mph (56 km/hr)]



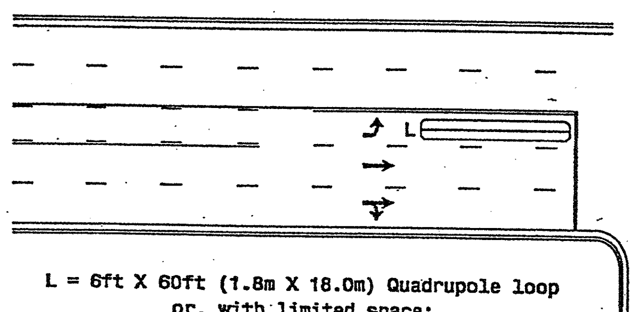
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

OR



L = 6ft X 60ft (1.8m X 18.0m)
Quadrupole loop, wired separately

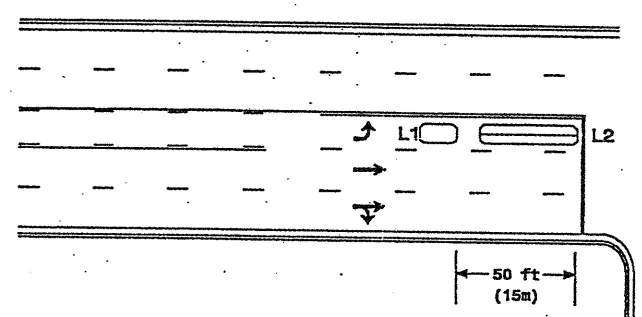
Left Turn Lane Detection



L = 6ft X 60ft (1.8m X 18.0m) Quadrupole loop
or, with limited space:
6ft X 50ft (1.8m X 15.0m) Quadrupole loop
or
6ft X 40ft (1.8m X 12.0m) Quadrupole loop

Presence Loop Detection

OR

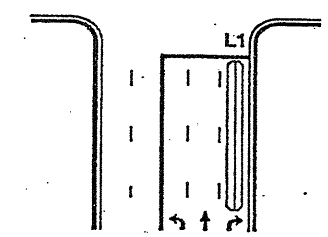


L1 = 6ft X 15ft (1.8m X 4.6m) Queue detector
L2 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

Queue Loop Detection

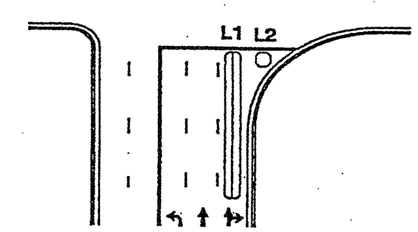
Right Turn Lane Detection

Standard Turn

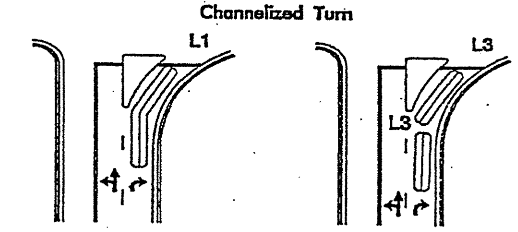


L1 = 6ft X 60ft (1.8m X 18.0m) Quadrupole loop
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop
Wired separately
L3 = 6ft X 30ft (1.8m X 9.0m) Quadrupole loop
Wired in series

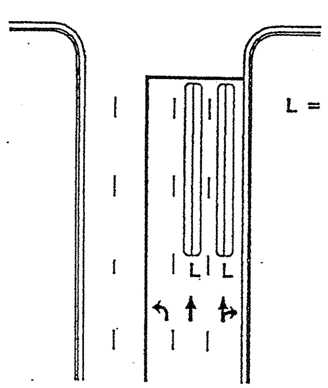
Wide Radius Turn



Channelized Turn



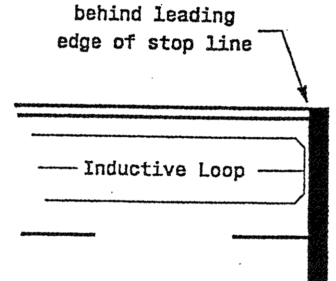
Side Street Detection



L = 6ft X 60ft (1.8m X 18.0m)
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 when stop line is greater than 15' (4.5m) from edge of intersecting roadway; or, when loop detects a permitted or exclusive/permitted left turn.

Recommended Number of Turns

Single 6' X 6' (1.8m X 1.8m) loop (wired separately):

Length of Lead-in ft (m)	Number of Turns
< 250 (75)	3
250-375 (75-115)	4
375-525 (115-160)	5
> 525 (160)	6

Quadrupole loops: Use 2-4-2 turns

6' X 15' (1.8m X 4.6m) Loops:
Lead-in < 150' (45 m), use 2 turns
Lead-in > 150' (45 m), use 3 turns

Typical Loop Locations

PLAN DATE: July 2003
PREPARED BY: P L Alexander
REVIEWED BY:
REVIEWED BY:
REVISIONS | INIT. | DATE

SCALE
N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23198 PAMELA L. ALEXANDER

7/15/03
SIGNATURE DATE
SIG. INVENTORY NO.