MINNESOTA DEPARTMENT OF TRANSPORTATION

ANOKA COUNTY

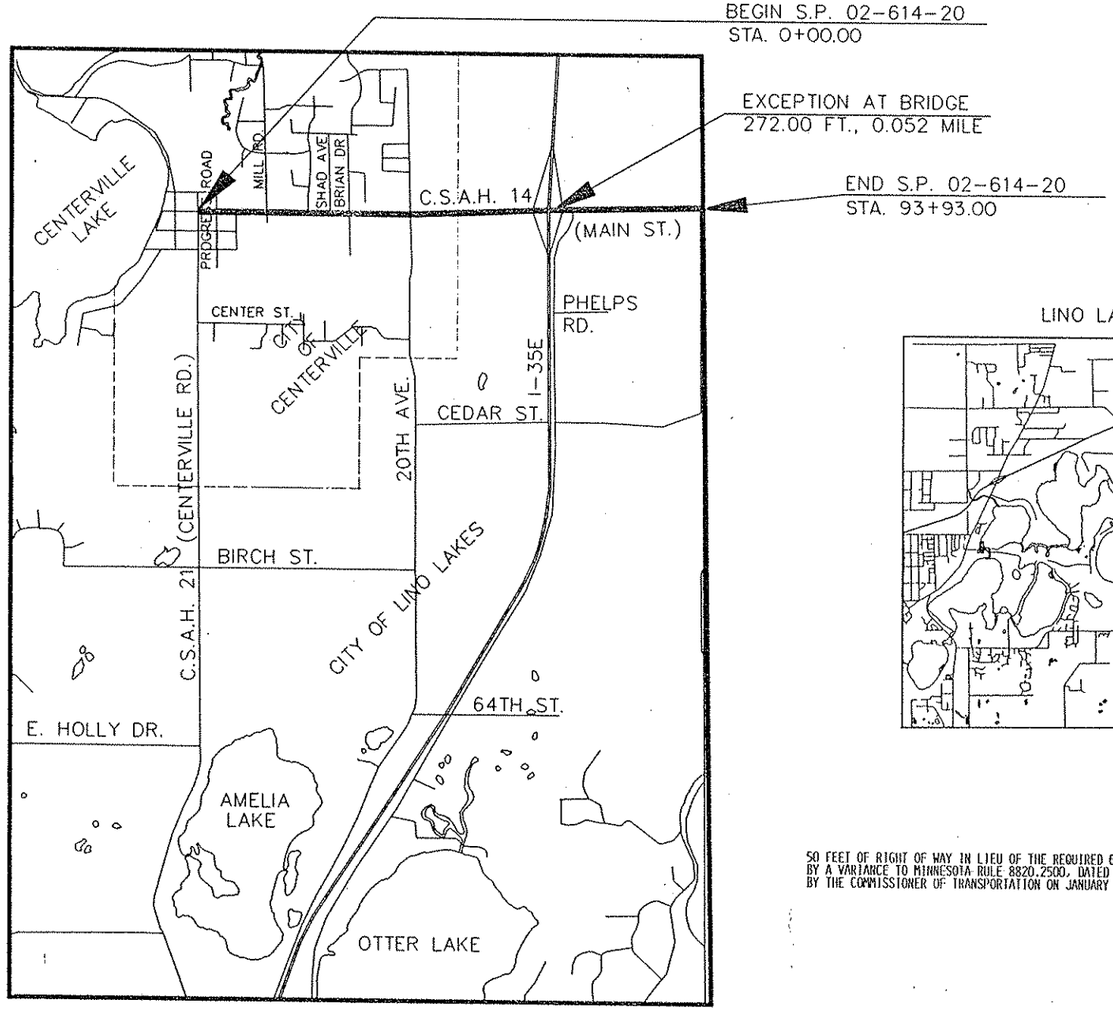
CONSTRUCTION PLAN FOR BITUMINOUS OVERLAY

LOCATED ON CSAH 14 IN THE CITY OF CENTERVILLE BETWEEN C.S.A.H. 21 AND LINO LAKES CITY LIMITS, AND
LOCATED ON CSAH 14 IN THE CITY OF LINO LAKES BETWEEN CENTERVILLE CITY LIMITS AND 24TH AVE.-COUNTY LINE

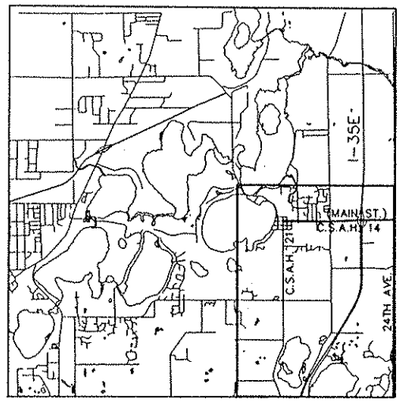
STATE PROJ. NO. 02-614-20 COUNTY PROJ. NO.

MN PROJ. NO.

GROSS LENGTH	9393.00	FEET	1.779	MILES	GROSS LENGTH	FEET	MILES
BRIDGES-LENGTH		FEET		MILES	BRIDGES-LENGTH	FEET	MILES
EXCEPTIONS-LENGTH	272.00	FEET	0.052	MILES	EXCEPTIONS-LENGTH	FEET	MILES
NET LENGTH	9121.00	FEET	1.727	MILES	NET LENGTH	FEET	MILES



LINO LAKES



50 FEET OF RIGHT OF WAY IN LIEU OF THE REQUIRED 60 FEET IS ALLOWED BY A VARIANCE TO MINNESOTA RULE 8820.2500, DATED JULY, 1993, APPROVED BY THE COMMISSIONER OF TRANSPORTATION ON JANUARY 6, 1994.

PLAN SYMBOLS

COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
RIGHT OF WAY LINE
SLOPE EASEMENT
PRESENT RIGHT OF WAY
PROPERTY LINE
CORPORATE OR CITY LIMITS
RETAINING WALL
RAILROAD
RAILROAD RIGHT OF WAY
RIVER OR CREEK
DRAINAGE DITCH
CULVERT
DROP INLET
GUARD RAIL
BARBED WIRE FENCE
WOVEN WIRE FENCE
CHAIN LINK FENCE
WOOD FENCE
STONE WALL OR FENCE
HEDGE
LOWLAND
TIMBER (ORCHARD, BRUSH, NURSERY)
CATTLE GUARD
OVERPASS (Highway Over)
UNDERPASS (Highway Under)
BRIDGE
BUILDING (One Story Frame) (F-FRAME C-CONCRETE S-STONE T-TILE B-BRICK ST-STUCCO)
RAILROAD CROSSING BELL
RAILROAD CROSSING GATE
MANHOLE
CATCH BASIN
FIRE HYDRANT
CAST IRON VALVE BOX
IRON PIN
GRAVEL PIT
SAND PIT
BORROW PIT
ROCK QUARRY

UTILITY SYMBOLS

POWER POLE LINE
TELEPHONE OR TELEGRAPH POLE LINE
JOINT TELEPHONE & POWER ON POWER POLES
ON TELEPHONE POLES
ANCHOR
STEEL TOWER
STREET LIGHT
PEDESTAL (Cable Terminal)
GAS MAIN
WATER MAIN
TELEPHONE CABLE IN CONDUIT
ELECTRIC CABLE IN CONDUIT
TELEPHONE MANHOLE
ELECTRIC MANHOLE
BURIED TELEPHONE CABLE T-BUR
BURIED ELECTRIC CABLE P-BUR
AERIAL TELEPHONE CABLE T-AE
SEWER (Sanitary or Storm)
SEWER MANHOLE

SCALES

PLAN 0 50 100
PROFILE HORIZONTAL 0 50 100
PROFILE VERTICAL 0 5 10
X-SECTIONS HORIZONTAL 0 10 20
X-SECTIONS VERTICAL 0 10 20
INDEX MAP 0 1

MINN. PROJ. NO.
MINN. PROJ. NO. STP PAVE (010)

GOVERNING SPECIFICATIONS

THE 1988 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AS AMENDED BY THE JANUARY 2, 1991 SUPPLEMENTAL SPECIFICATIONS SHALL GOVERN.

INDEX

THIS PLAN CONTAINS 6 SHEETS

DESIGN DESIGNATION

$\mathfrak{E}18_{20}$ NA
R VALUE NA
ADT (1993)= 6009
Proj. ADT (2013)= 10,216
Proj. HCADT (2013)= 766
Soil Factor 100%
9 TON DESIGN
Shoulder Width 8'-10'

Functional Classification HIGH DENSITY COLLECTOR
No. of Traffic Lanes 2 No. of Parking Lanes 2
Design Speed 55* MPH
Based on Stopping Sight Distance
Height of eye 3.5 Height of object 0.5
Design Speed not achieved at:
STA. 69+84 TO STA. 81+24 MPH. 50
STA. 24+82 TO STA. 26+82 MPH. 35 *
STA. 28+30 TO STA. 31+30 MPH. 45 **

* POSTED SPEED IS 30 MPH
** POSTED SPEED IS 45 MPH

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 8/27/93 REG. NO. 20235 ENGR. Douglas A. Fischer, DESIGN ENGINEER
DESIGN SQUAD J. TRICK

Recommended for Approval Michael B. Kelly RIGHT-OF-WAY SECTION 8/27, 1993
Recommended for Approval Mark Perbix TRAFFIC SECTION 8/27, 1993
Recommended for Approval Jon Allar DEPUTY COUNTY ENGINEER 8/27, 1993
Approved 8/30, 1993 ANOKA COUNTY ENGINEER
Approved 9/9, 1993 CITY OF LINO LAKES
Approved 9/23, 1993 CITY OF CENTERVILLE
Recommended for Approval Mary K. Biermaier METRO-ASST. DIV. ENGINEER-STATE AID 11/10, 1993
Recommended for Approval Mark Kuhnhausen FOR STATE AID DIVISION 4-5, 1994
Approved 4/5, 1994 STATE AID ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

STATE AID PROJ. NO.
STATE PROJ. NO. 02-614-20 SHEET NO. 1 OF 6 SHEETS

Fed. Project No. _____

STATEMENT OF ESTIMATED QUANTITIES

CHART ID.	ITEM NO.	ITEM	UNIT	TOTAL QUANTITIES		S.P. 02-614-20		NON-PARTICIPATING	
				ESTIMATE	FINAL	ESTIMATE	FINAL	ESTIMATE	FINAL
	0015.601	COMPUTER EQUIPMENT	LUMP SUM	0.10		0.10			
A	2104.501	REMOVE PIPE CULVERTS	LIN FT	45		45			
	2104.523	SALVAGE METAL APRON	EACH	35		35			
	2104.523	SALVAGE CONCRETE APRON	EACH	2		2			
A	2105.523	COMMON BORROW (LV)	CU YD	168		168			
E	2232.501	MILL BITUMINOUS SURFACE	SQ YD	999		999			
④	2340.508	TYPE 41 WEARING COURSE MIXTURE	TON	2007		2007			
	2340.516	TYPE 41 SHOULDER COURSE MIXTURE	TON	1590		1590			
	2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GAL	2179		2179			
⑥	B 0412.602	MAILBOX SUPPORT	EACH	31		31			
③	2501.511	15" CS PIPE CULVERT	LIN FT	316		316			
③	A 2501.511	18" CS PIPE CULVERT	LIN FT	58		58			
③	A 2501.511	24" CS PIPE CULVERT	LIN FT	4		4			
	A 2501.561	36" RC PIPE CULVERT DESIGN 3006 CL II	LIN FT	34		34			
②	A 0501.602	15" CS SAFETY APRON	EACH	12		12			
②	A 0501.602	18" CS SAFETY APRON	EACH	1		1			
②	A 0501.602	24" CS SAFETY APRON	EACH	2		2			
	C 2501.573	INSTALL METAL APRON	EACH	35		35			
	2501.573	INSTALL CONCRETE APRON	EACH	2		2			
	2506.522	ADJUST FRAME AND RING CASTING	EACH	4		4			
⑤	2535.501	BITUMINOUS CURB	LIN FT	195		195			
①	0563.601	TRAFFIC CONTROL	LUMP SUM	0.10		0.10			
	2575.502	SEED MIXTURE 700	LB	8		8			
	D 2575.505	SODDING TYPE EROSION	SQ YD	1821		1821			
	D 2575.511	MULCH MATERIAL TYPE 1	TON	0.4		0.4			
	D 2575.521	POLYPROPYLENE PLASTIC NETTING	SQ YD	1060		1060			
	D 2575.532	COMMERCIAL FERTILIZER ANALYSIS 10-10-10	LB	298		298			
	D 0575.605	SEEDING	SQ YD	1060		1060			
	D 2580.501	TEMPORARY LANE MARKING	ROAD STA	91		91			

NOTES:

① ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MMUTCD, INCLUDING APPENDIX B DATED NOVEMBER 1992.

② PER STANDARD PLATE 3128. NO GRATE REQ.

③ INCLUDES ALL PIPE COUPLINGS AS REQUIRED.

④ INCLUDES 148 TONS FOR STREET APPROACHES AND ENTRANCES.

⑤ F & I BITUMINOUS CURB AT LOCATIONS DESIGNATED BY THE ENGINEER.

⑥ INCLUDES SALVAGING AND INSTALLING OF EXISTING MAILBOX AND F&I NEW SUPPORT.

BASIS OF QUANTITIES

TYPE 41 WEAR COURSE & SHOULDER MIXTURE:
110 LB/SY/INCH

BITUMINOUS MAT'L FOR TACK:
0.05 GAL/SY

SEED MIXTURE NO. 700: 35 LBS/ACRE

MULCH MAT'L TYPE 1: 2 TONS/ACRE

COMMERCIAL FERTILIZER, ANALYSIS 10-10-10:
500 LBS/ACRE

SEEDING: HORIZONTAL MEASUREMENT +10%

BITUMINOUS MIXTURE DESIGNATIONS:
41 WEA 50070Y
41 SHA 50070Y

INDEX OF TABULATION CHARTS

CHART ID	SHEET NO.	DESCRIPTION
A	3	ENTRANCE APPROACH IMPROVEMENTS
B	3	MAILBOX SUPPORTS
C	3	MISCELLANEOUS REMOVALS
D	3	TURF ESTABLISHMENT
E	3	BITUMINOUS MILLING

THESE STANDARD PLATES, AS APPROVED BY THE FHWA SHALL APPLY

STANDARD PLATES

0005 A	SPECIFICATION REFERENCE TO STANDARD PLATES
3000 L	REINFORCED CONCRETE PIPE
3006 F	GASKET JOINT FOR R.C. PIPE
3040 F	CORRUGATED METAL PIPE CULVERT
3124 B	METAL APRON CONNECTION
3128 F	SAFETY APRON
3145 E	CONCRETE PIPE TIES
3221 C	CORRUGATED STEEL PIPE COUPLING BAND
7065 C	BITUMINOUS CURB
8000 I	STANDARD BARRICADES
9102 D	TURF ESTABLISHMENT AREAS

ESTIMATED QUANTITIES

Fed. Project No. _____

ENTRANCE APPROACH IMPROVEMENTS (A)

STATION	LOC	ADDRESS	EXISTING CULVERT (2) SIZE	EXISTING CULVERT (2) TYPE	REMOVE CULV. LIN.FT	REMOVE APRON EACH	SALVAGE AND INSTALL APRON EACH	FURNISH AND INSTALL REPLACE LIN.FT	EXT.LT LIN.FT	EXT.RT LIN.FT	APRONS 15'	APRONS OTHER	EMBANKMENT LEFT(CY)	EMBANKMENT RIGHT(CY)
3+28	LT	PROGRESS RD	N/A						0	0			0.0	0.0
3+28	RT	PROGRESS RD	N/A						0	0			0.0	0.0
4+58	RT	1740	N/A						0	0			0.0	0.0
5+00	LT	1745	N/A						0	0			0.0	0.0
6+37	RT	1744	N/A						0	0			0.0	0.0
6+81	LT	1759	N/A						0	0			0.0	0.0
7+94	RT	1764	N/A						0	0			0.0	0.0
8+37	RT	CEN TREE FAR	N/A						0	0			0.0	0.0
10+38	LT	1781	N/A						0	0			0.0	0.0
11+89	LT	CEMETARY	N/A						0	0			0.0	0.0
11+95	RT	1798	15"x28"	CMP		0	2		10	10			1.5	2.0
13+17	LT	MILL ROAD	18"x36"	SMP		0	2		4	4			0.5	0.5
13+20	RT	1798	15"x30"	CMP		0	2		4	8			0.5	1.0
14+38	RT	1810	15"x29"	CMP		0	1		10	4	1		2.0	0.5
14+90	LT	TRIPPELS	15"x31"	SMP		0	1		12	8	1		2.0	1.5
15+55	RT	1824	15"x26"	CMP		0	2		6	4			0.5	0.5
17+38	RT	1832	15"x33"	CMP		0	2		8	6			1.0	0.5
18+69	RT	1844	15"x30"	CMP		0	2		8	4			1.0	0.5
20+13	RT	1858	15"x28"	CMP		0	2		4	0			0.5	0.0
20+64	LT	PETERSON	15"x45"	CMP	45	0		66	0	0	2		2.5	3.0
21+42	RT	1862	15"x30	SMP		0			8	4	2		2.5	1.0
23+53	LT	1873	N/A						0	0			0.0	0.0
24+52	LT	SHAD AVE.	N/A						0	0			0.0	0.0
28+23	LT	BRIAN DR.	24"x91"	SMP		0			4	0		2	2.5	0.0
28+23	RT	BRIAN DR.	15"x51"	CMP		0	1		0	0	1		0.0	0.0
31+78	RT	F. ENT	15"x22"	CMP		0	2		4	6			0.5	0.5
33+61	LT	1969	15"x18"	CMP		0			6	6	2		0.5	0.5
35+12	LT	1973	N/A						0	0			0.0	0.0
35+18	RT	OLSON'S	15"x27"	CMP		0	2		4	6			0.5	0.5
36+02	LT	1976	N/A						0	0			0.0	0.0
36+23	RT	1988	N/A						0	0			0.0	0.0
37+10	LT	1979	N/A						0	0			0.0	0.0
37+42	RT	TEXACO	15"x48"	CMP		0	1		8	10	1		1.5	1.0
37+30	LT	1990	N/A						0	0			0.0	0.0
39+60	LT	20TH AVE	36"x69"	RCP		0	2		14	20			10.5	18.0
39+60	RT	20TH AVE	18"x69"	CMP		0	2		14	10			9.0	6.5
52+81	RT	21ST AVE	N/A						0	0			0.0	0.0
53+31	LT	F. ENT	15"x29"	CMP		0	1		2	4	1		0.5	0.5
53+31	RT	F. ENT	N/A						0	0			0.0	0.0
68+17	RT	OTTER LAKE	N/A						0	0			0.0	0.0
70+84	LT	F. ENT	15"x29"	CMP		0	2		2	0			0.5	0.0
71+08	RT	F. ENT	15"x29"	CMP		0	2		0	2			0.0	0.5
75+22	RT	2290	15"x30"	CMP		0	2		6	6			1.5	1.0
75+72	RT	2290	15"x30"	CMP		0	2		8	8			1.0	3.0
78+83	RT	F. ENT	N/A						0	0			0.0	0.0
78+84	LT	2309	N/A						0	0			0.0	0.0
79+69	LT	2325	15"x32"	CMP		0	2		10	8			3.0	3.5
80+24	LT	2325	15"x43"	CMP		0			14	12	1		6.0	5.5
86+60	LT	2373	18"x47"	CMP		0			12	14		1	3.0	5.0
TOTALS					45	0	34	66	182	164	12	3	55.0	57.0

(1) EARTHWORK SUMMARY:

COMMON BORROW (LV) = EMBANKMENT x 1.5 = (55.0 + 57.0) x 1.5 = 168.00 CU. YD.

(2) CMP DESIGNATES METAL PIPE WITH A STANDARD 2-2/3" x 1/2" CORRUGATION. SMP DESIGNATES METAL PIPE WITH A SPIRAL CORRUGATION.

NOTE: ENTRANCE APPROACHES SCHEDULED FOR IMPROVEMENTS SHALL BE FLATTENED TO 6:1 SLOPES.

MAILBOX SUPPORT CHART (B)

STATION	LOCATION	ADDRESS	RELOCATE
0+00	21.4' LT	1709, ?	2
3+62	21.0' RT	1724/1737/7085	3
5+00	21.5' RT	1740/1742/1744	3
7+57	22.0' RT	1759/1764	2
10+45	26.0' RT	1781	1
12+95	26.0' RT	1798	1
14+70	29.0' RT	1810	1
15+90	28.0' RT	1824	1
17+14	28.0' RT	1832	1
18+50	28.5' RT	1844	1
20+26	30.0' RT	1858	1
21+17	30.0' RT	1862	1
23+29	28.5' RT	1873	1
33+52	26.5' RT	1969	1
35+42	27.0' RT	1973	2
35+96	29.0' RT	1979/1976/1988	3
38+06	25.5' RT	1981/1990	2
75+98	24.5' RT	2290	1
78+40	24.0' RT	2309	1
80+11	25.0' RT	2325	1
86+43	25.0' RT	2373	1
TOTALS			31

MISCELLANEAOUS REMOVAL CHART (C)

STATION	LOCATION	ITEM	REMARKS
		HYDRANT (EA)	
TOTAL		NONE	

TURF ESTABLISHMENT (D)

STATION	LOC	SEEDING SQ YD	SEED MIX 700 LB.	SODDING TYPE EROSION CONTROL SQ. YD.	MULCH MATERIAL TYPE 1 TON	DISK ANCHORING SQ YD	COMMERCIAL FERTILIZER ANALYSIS 10-10-10 LB.	POLYPROPYLENE PLASTIC NETTING SQ. YD.
4+58	RT			27			2.8	
6+38	RT			14			1.4	
11+90	LT			16			1.7	
11+95	RT			75			7.7	
13+17	LT			64			6.6	
13+20	RT			66			6.8	
14+38	RT			74			7.6	
14+90	LT			76			7.9	
15+55	RT			58			6.0	
17+38	RT			66			6.8	
18+69	RT			63			6.5	
20+13	RT			55			5.7	
20+64	LT	76	0.6		0.03		7.9	76
21+42	RT			132			13.6	
28+23	LT			261			27.0	
28+23	RT			109			11.3	
31+78	RT	43	0.3		0.02		4.4	43
33+61	LT			33			3.4	
35+18	RT			46			4.8	
37+42	RT			47			4.9	
39+60	LT			204			21.1	
39+60	RT	197	1.4		0.08		20.4	197
52+81	RT	78	0.6		0.03		8.1	78
53+31	LT	62	0.5		0.03		6.5	62
53+31	RT	46	0.3		0.02		4.8	46
68+17	RT	235	1.7		0.10		24.3	235
70+84	LT	41	0.3		0.02		4.2	41
71+08	RT	44	0.3		0.02		4.5	44
75+22	RT	81	0.6		0.03		8.4	81
75+72	RT	103	0.7		0.04		10.6	103
78+83	RT	54	0.4		0.02		5.6	54
79+69	RT			89			9.2	
80+24	RT			113			11.7	
86+60	RT			133			13.7	
TOTALS		1060	7.7	1821	0.44	0	297.9	1060

BITUMINOUS MILLING (E)

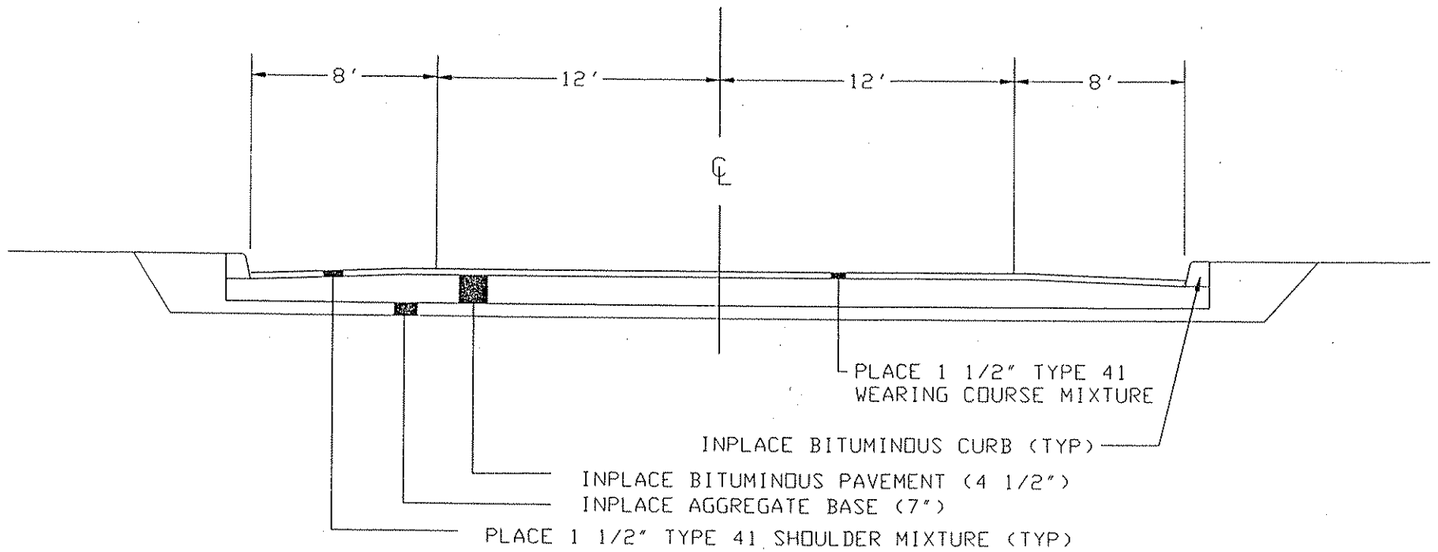
STATION	LOC	AREA(SY)	REMARKS
0+00	LT & RT	89	TOUCHDOWN POINT, 20' FULL WIDTH
0+00 TO 0+20	RT	89	20' WIDTH ACROSS CSAH 21
40+50	RT	89	20' WIDTH ACROSS CR 54
40+50	LT	89	20' WIDTH ACROSS CSAH 21
60+31 TO 61+89	RT	105	6' WIDTH ALONG SB ENTRANCE RAMP
60+31 TO 61+89	LT	105	6' WIDTH ALONG SB EXIT RAMP
63+45	LT & RT	19	6' WIDTH AT BRIDGE APPROACH
66+17	LT & RT	19	6' WIDTH AT BRIDGE APPROACH
67+73 TO 69+31	RT	105	6' WIDTH ALONG NB EXIT RAMP
67+73 TO 69+31	LT	105	6' WIDTH ALONG NB ENTRANCE RAMP
71+22 TO 71+62	RT	89	20' WIDTH ACROSS CR 84
93+93	LT & RT	96	TOUCHDOWN POINT, 20' FULL WIDTH
TOTALS		999	

TABULATED QUANTITIES

Fed. Project No. _____

TYPICAL SECTION

STATION 0+00 TO STATION 13+06 ① ③
(CSAH 21 TO MILL ROAD)



NOTES:

① TOTAL ROADWAY WIDTH VARIES FROM 40' TO 41' THROUGH THIS SECTION.

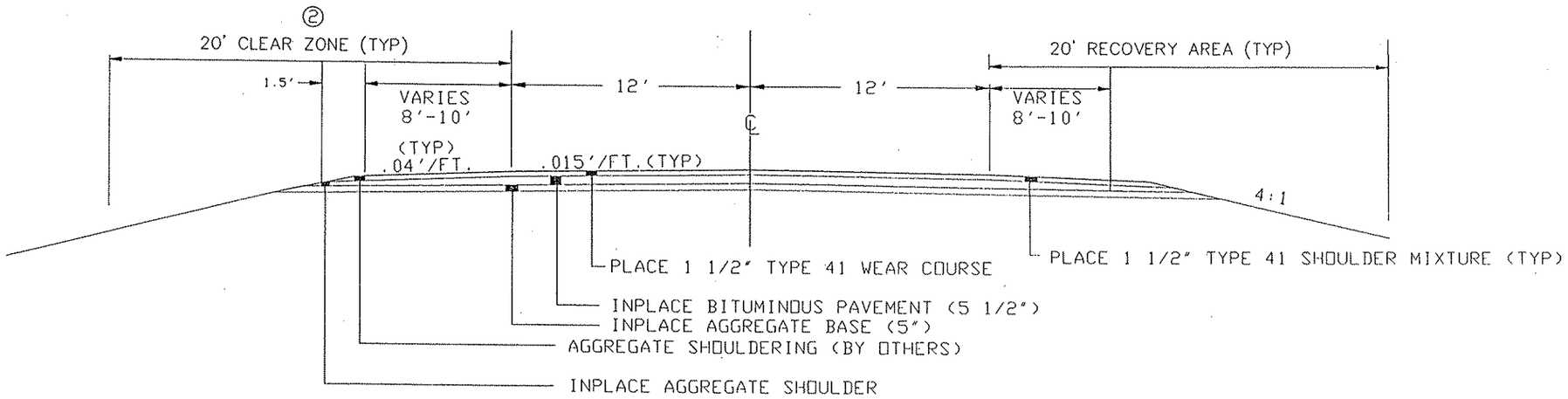
② PROVIDE OBSTACLE-FREE AREA WITHIN THIS ZONE. SEE CHART C FOR MISC. REMOVALS.

③ MINIMUM R/W WIDTH = 50'

④ MINIMUM R/W WIDTH = 66'

TYPICAL SECTION

STATION 13+06 TO STATION 93+93 ④
(MILL ROAD TO EAST COUNTY LINE)



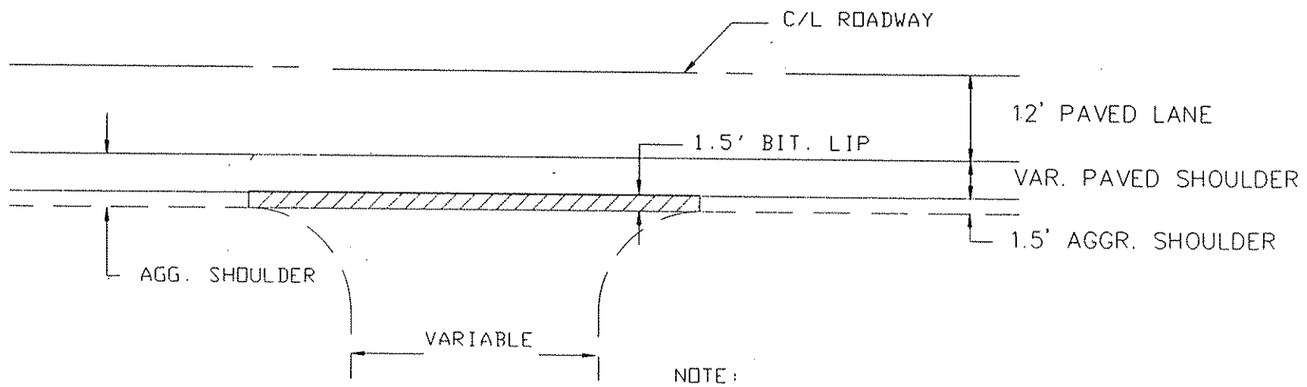
NOTE: NOT TO SCALE

TYPICAL SECTIONS

Fed. Project No. _____

TYPICAL ENTRANCES

PAVED AND UNPAVED STREETS AND ENTRANCES

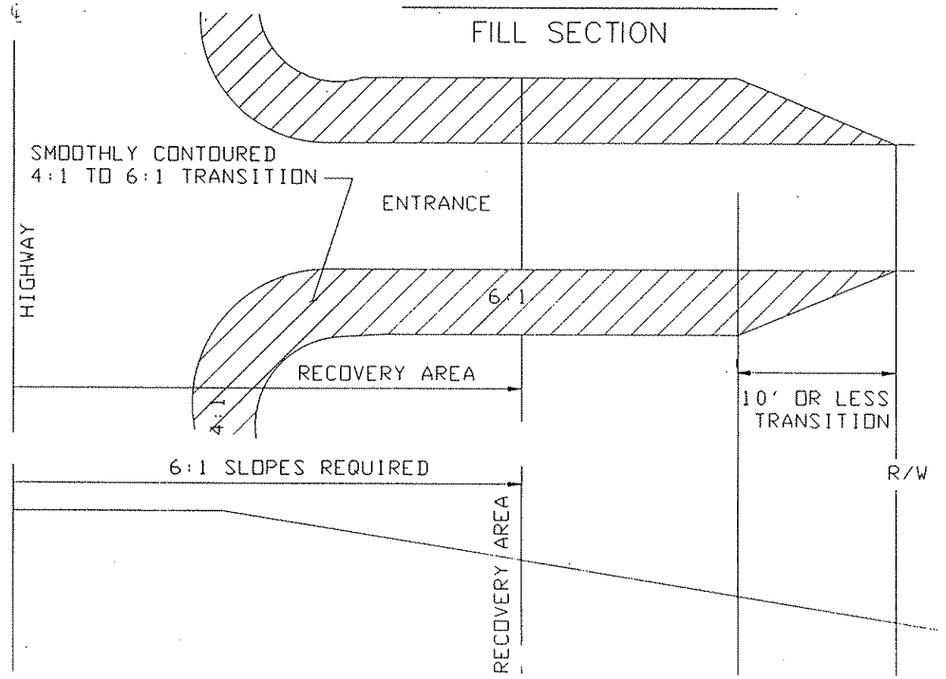


NOTE:
ON PAVED ENTRANCES TACK PAVEMENT & FEATHER BIT. TO BLEND WITH EXISTING DRIVEWAY.

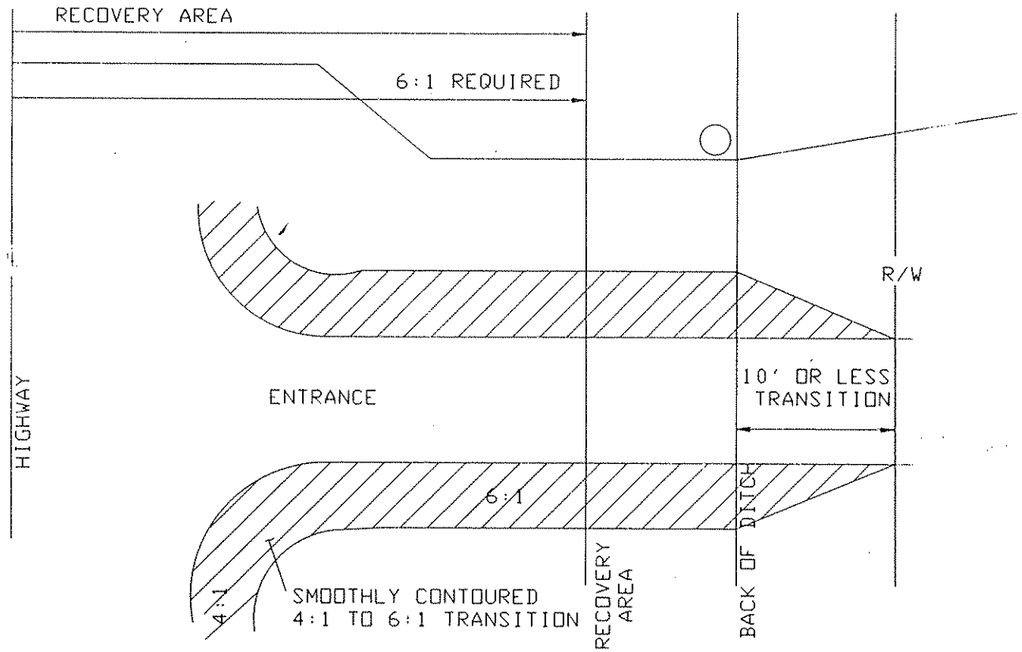
NOTE: NOT TO SCALE

ENTRANCE SLOPES

FILL SECTION



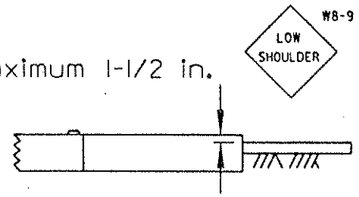
DITCH SECTION



STANDARD DETAILS

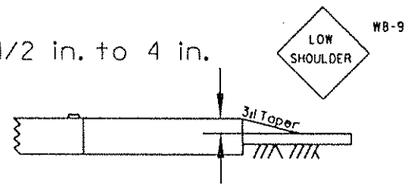
EDGE DROP OFF

Maximum 1-1/2 in.



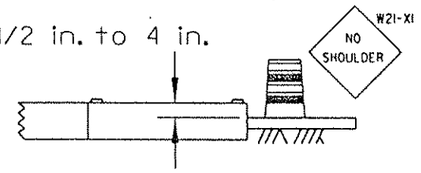
EDGE DROP OFF - WITH TAPER

1-1/2 in. to 4 in.



1-1/2 in. to 4 in.

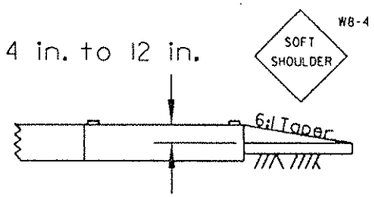
SHOULDER SHALL BE CLOSED WITH APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES AT A MAXIMUM OF 100 FT. SPACING.



EDGE DROP-OFF WITH TAPER (SHOULDER - OPEN)

4 in. to 12 in.

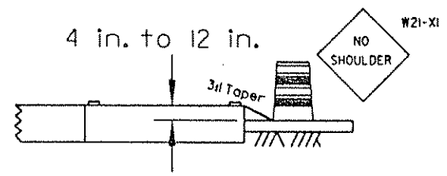
THIS CONDITION WILL NOT BE PERMITTED UNLESS THE 6:1 SLOPE IS COMPACTED SO THAT A VEHICLE MAY SAFELY DRIVE ONTO IT WITHOUT LOSING CONTROL AND IN THE OPINION OF THE ENGINEER THERE ARE NO OTHER HAZARDOUS CONDITIONS.



EDGE DROP-OFF WITH TAPER (SHOULDER - CLOSED)

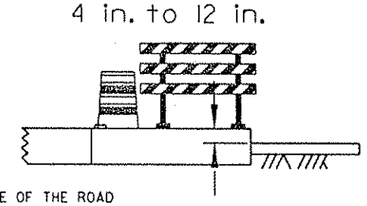
4 in. to 12 in.

SHOULDER SHALL BE CLOSED WITH APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES AT A MAXIMUM OF 100 FT. SPACING



4 in. to 12 in.

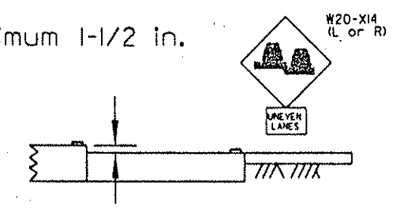
ADJACENT LANE SHALL BE CLOSED WITH APPROPRIATE LANE CLOSURE LAYOUT SHOWN IN APPENDIX B. CHANNELIZING DEVICES TO BE AT A MAXIMUM OF 100 FT. SPACING AND TYPE III EVERY 1000 FT.



NOTE: SIGNS ARE REQUIRED ONLY ON THE SIDE OF THE ROAD THAT IS AFFECTED BY CONSTRUCTION (EXCEPT SIGNS THAT ARE FOR A LANE CLOSURE ON DIVIDED HIGHWAYS).

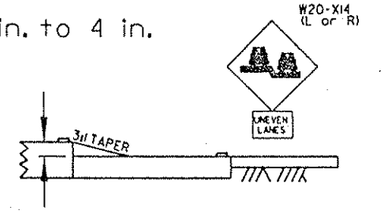
UNEVEN LANES

Maximum 1-1/2 in.

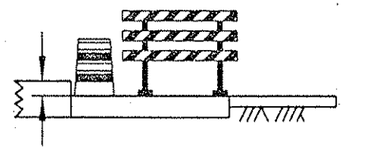


UNEVEN LANES - WITH TAPER

1-1/2 in. to 4 in.



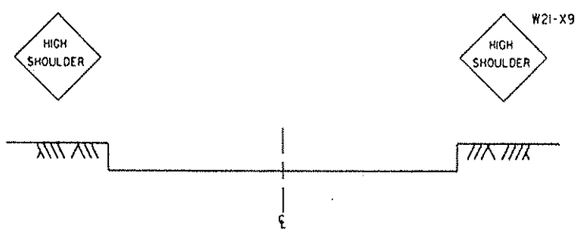
1-1/2 in. to 4 in.



LANE SHALL BE CLOSED WITH APPROPRIATE LANE CLOSURE FROM APPENDIX B. CHANNELIZING DEVICES AT A MAXIMUM OF 100 FT. SPACING AND A TYPE III BARRICADE EVERY 1000 FT.

NOTE: FOR DIVIDED HIGHWAYS, USE SIGNS ON RIGHT AND LEFT SIDE. SIGN SEQUENCE SHOWN FOR ONE DIRECTION ONLY; OTHER DIRECTION SHALL BE IDENTICAL.

MILLED EDGE



NOTE: MILLED EDGES SHOULD BE TREATED WITH TAPERS, CHANNELIZERS, AND SIGNING AS SHOWN ON EDGE DROP-OFF DETAILS.

NOTE: ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING APPENDIX B, DATED NOVEMBER 1992.

GUIDELINES

THESE GUIDELINES ARE INTENDED TO INCREASE TRAFFIC SAFETY USING TRAFFIC CONTROL DEVICES, SAFETY RELATED APPURTENANCES, AND CONSTRUCTION TECHNIQUES FOR UNEVEN LANES, MILLED EDGES, AND EDGE DROP-OFFS THAT OCCUR IN HIGHWAY WORK ZONES. THE BEST WAY TO INCREASE TRAFFIC SAFETY IS TO MAKE EVERY ATTEMPT TO MINIMIZE EXPOSURE TO UNEVEN LANES, MILLED EDGES, AND EDGE DROP-OFFS; HOWEVER, IT IS REALIZED THAT THIS IS OFTEN NOT POSSIBLE OR FEASIBLE. ONLY WHEN UNEVEN LANES, MILLED EDGES, OR EDGE DROP-OFFS ARE DEEMED NECESSARY, SHALL THE APPROPRIATE PORTION(S) OF THESE GUIDELINES BE APPLIED TO ENHANCE TRAFFIC SAFETY.

APPROPRIATE UNEVEN LANE WARNING SIGNS OR SHOULDER WARNING SIGNS SHALL BE REPEATED AFTER EACH INTERSECTION.

MAXIMUM WARNING SIGN SPACING SHALL BE:
- A - 1 MILE WHEN THE SPEED LIMIT IS GREATER THAN 30 MPH AND
- B - 1/4 MILE WHEN THE SPEED LIMIT IS 30 MPH OR LESS.

WHEN SPACE PERMITS, MINIMUM WARNING SIGN SIZE SHALL BE:
- A - 48 INCHES x 48 INCHES WHEN THE SPEED LIMIT IS GREATER THEN 30 MPH AND
- B - 36 INCHES x 36 INCHES WHEN THE SPEED LIMIT IS 30 MPH OR LESS.

1. FOR DROP-OFFS OF 1-1/2 INCHES OR LESS, APPROPRIATE WARNING SIGNS SHALL BE PROVIDED.
2. FOR DROP-OFFS GREATER THAN 1-1/2 INCHES UP TO 4 INCHES:
   - A - THE EDGE SHALL BE TAPERED AND COMPACTED AT A RATE OF 3:1 AND APPROPRIATE WARNING SIGNS SHALL BE PROVIDED; OR
   - B - IF THE TAPER IS NOT PROVIDED, TRAFFIC SHALL NOT BE PERMITTED TO CROSS THE DROP-OFF AND THAT PORTION OF THE ROADWAY SHALL BE CLOSED TO TRAFFIC WITH THE APPROPRIATE WARNING SIGNS AND DEVICES.
3. FOR DROP-OFFS GREATER THAN 4 INCHES UP TO 12 INCHES:
   - A - THE EDGE SHALL BE TAPERED AND COMPACTED AT A RATE OF 6:1 AND APPROPRIATE WARNING SIGNS SHALL BE PROVIDED, (6:1 TAPER SHALL NOT BE USED AS A TRAFFIC CARRYING LANE);
   - B - THE EDGE SHALL BE TAPERED AND COMPACTED AT A RATE OF 3:1, TRAFFIC SHALL NOT BE ALLOWED TO CROSS THE DROP-OFF, AND THAT PORTION OF THE ROADWAY SHALL BE CLOSED TO TRAFFIC WITH APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES; OR
   - C - IF A TAPER IS NOT PROVIDED, THE TRAFFIC OR AUXILIARY LANE ADJACENT TO THE DROP-OFF SHALL BE CLOSED TO TRAFFIC WITH THE APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES OR A POSITIVE BARRIER, SUCH AS A PORTABLE PRECAST CONCRETE BARRIER, SHALL BE PROVIDED TO PREVENT TRAFFIC FROM CROSSING THE DROP-OFF.
4. FOR SHOULDER EDGE DROP-OFFS:
   - A - 0-2 FOOT SHOULDER WIDTH AND A 0-12 INCH DROP-OFF; USE GUIDELINES AS SHOWN
   - B - 2-8 FOOT SHOULDER WIDTH AND A 0-4 INCH DROP-OFF; INSTALL EDGELINE OR USE GUIDELINES AS SHOWN
   - C - 8 FOOT OR GREATER SHOULDER WIDTH AND A 0-4 INCH DROP-OFF; NO TRAFFIC CONTROL REQUIRED
   - D - GREATER THAN 2 FOOT SHOULDER WIDTH AND A 4-12 INCH DROP-OFF; USE GUIDELINES AS SHOWN
5. DROP-OFFS GREATER THAN 4 INCHES ADJACENT TO TRAFFIC CARRYING LANES ARE PERMITTED WITHOUT TAPERS OR POSITIVE BARRIERS FOR:
   - A - PROJECTS WITHIN URBAN AREA WHEN THE SPEED LIMIT IS 30 MPH OR LESS; OR
   - B - SHORT TERM (7 CALENDAR DAYS OR LESS) CONCRETE OR UTILITY REPAIR, LESS THAN 50 FEET IN LENGTH WHEN THE SPEED LIMIT IS GREATER THAN 30 MPH.
6. AT NO TIME SHALL THERE BE MORE THAN ONE UNEVEN LANE CONDITION BETWEEN THE TRAFFIC CARRYING LANES WHICH INCLUDE AUXILIARY LANES, TURN LANES, AND RAMP ACCESS OR EGRESS AREAS. WEATHER PERMITTING, ALL EXPOSED UNEVEN LANES CONDITIONS WITHIN THE TRAFFIC CARRYING LANES SHALL BE 'MATCHED' WITHIN 24 HOURS.
7. MILLING OPERATIONS SHALL BE REQUIRED TO COMPLETE THE FULL WIDTH OF THE SECTION UNDER CONSTRUCTION AT THE END OF EACH WORK PERIOD.

Traffic Control Treatment of Longitudinal Joints and Edge Drop-offs in Work Zones

REFERENCE DATE: 3-12-92

STATE PROJ. NO. 02-614-20