

# MINNESOTA DEPARTMENT OF TRANSPORTATION ANOKA COUNTY

CONSTRUCTION PLAN FOR \_\_\_\_\_ MILL BITUMINOUS, BITUMINOUS SURFACING, CURB & GUTTER, AND STORM SEWER REPAIRS

LOCATED ON CSAH 51 BETWEEN 97 TH AVE AND 105 TH AVE

CSAH 51

GROSS LENGTH	5475.00 FEET	1.037 MILES
EXCEPTIONS-LENGTH	0.00 FEET	0.000 MILES
NET LENGTH	5475.00 FEET	1.037 MILES

GOVERNING SPECIFICATIONS  
THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.  
ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE LATEST FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

THIS PLAN CONTAINS 32 SHEETS

## INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	STATEMENT OF ESTIMATED QUANTITIES
3 - 4	TABULATIONS
5	TYPICAL SECTIONS
6 - 7	DETAILS
8 - 13	PEDESTRIAN CURB RAMP DETAILS
14 - 17	DRIVEWAY AND SIDEWALK DETAILS
18 - 21	CONSTRUCTION PLAN
22	PERMANENT MARKING TABULATION
23 - 24	TEMPORARY SIGNING, PERMANENT SIGNING, AND STRIPING
25	TRAFFIC CONTROL QUANTITY
26 - 28	SIGNING AND STRIPING DETAILS
29 - 32	ORIGINAL SIGNAL PLANS (FOR REFERENCE ONLY)

END SAP 002-651-008  
CSAH 51, STA: 66+00.00



BEGIN SAP 651-008  
CSAH 51, STA: 11+25.00

## PROJECT LOCATION

CITY OF COON RAPIDS AND BLAINE  
ANOKA COUNTY  
MN/DOT TRANSPORTATION DISTRICT - METRO  
SECTION 12  
TOWNSHIP 31 NORTH  
RANGE 24 WEST

Approved Jan M. Kelly 04/06/2017  
CITY OF BLAINE ENGINEER

Approved [Signature] 4/2/2017  
CITY OF COON RAPIDS ENGINEER

Approved [Signature] 3/23/2017  
ANOKA COUNTY ENGINEER

Julie Dresel DATE 4/10/17  
DISTRICT/STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

Julie Dresel DATE 4/10/17  
STATE AID ENGINEER: APPROVED FOR STATE AID FUNDING

### DESIGN DESIGNATION (CSAH 51)

ESAL 20	2,520,819	FUNCTIONAL CLASSIFICATION	A MINOR ARTERIAL
R VALUE	70	NO. OF TRAFFIC LANES	4
ADT (2017)	23709	NO. OF PARKING LANES	0
PROJ. ADT (2037)	23709	DESIGN SPEED	45 MPH
PROJ. HCADT (2037)	1399	STOPPING SIGHT DISTANCE BASED ON:	
SOIL FACTOR	NA	HEIGHT OF EYE	3.5'
		HEIGHT OF OBJECT	2.0'
		DESIGN SPEED NOT ACHIEVED AT:	
		STA.	TO STA.
			MPH



NO	DATE	BY	CKD	APPR	REVISION		
						03/14/2017	8:54:27 AM

NAME: P:\115-01-00\CSAH\_51(97th-106th)\Base\PROPOSED\TEMPLATE\_PLAN.dgn

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
PRINT NAME: MATTHEW J. JOHN  
SIGNATURE: [Signature]  
DATE: 3/14/2017 LICENSE NO. 51639

DRAWN BY: KPR DATE 01/20/2017  
DESIGN BY: KPR DATE 01/20/2017  
CHECKED BY: M.J. DATE 02/03/2017



**ANOKA COUNTY  
HIGHWAY DEPT.**

STATE AID PROJECT 002-651-008

TITLE SHEET  
Sheet 1 of 32 Sheets



STORM DRAINAGE TAB

NUMBER	TYPE	ACTION	NEW CASTING	FURNISH AND INSTALL CASTING ASSEMBLY	STRUCTURE TYPE	EXISTING RING HEIGHT	REMOVE DRAINAGE STRUCTURE	GROUT CATCH BASIN OR MANHOLE	DRAINAGE STRUCTURE H	DRAINAGE STRUCTURE 48-4020	SAWING CONCRETE PAVEMENT (FULL DEPTH)	REMOVE CURB & GUTTER	CONCRETE CURB & GUTTER DESIGN B612	CONCRETE CURB & GUTTER DESIGN B618	SAWING PAVEMENT (FULL DEPTH)	REMOVE BITUMINOUS PAVEMENT	TYPE SP 12.5 BIT MIXTURE FOR PATCHING
						LIN FT	EACH	EACH	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ YD	TON	
99	CB	GROUT STRUCTURE						1									
100	CB	RE-RING	B	1		0.2					6	10		10	14	2	1
101	CB	RE-RING / GROUT STRUCTURE	B	1		0.4		1			6	10		10	14	2	1
102	CB	RE-RING	B	1		0.4					6	10		10	14	2	1
103	CB	GROUT STRUCTURE						1									
104	CB	OK															
105	CB	RE-RING	B	1		0.8					6	10		10	14	2	1
106	CB	RE-RING	B	1		0.7					6	10		10	14	2	1
107	CB	RE-RING	B	1		0.7					6	10		10	14	2	1
108	CB	GROUT STRUCTURE						1									
109	MH	OK															
110	CB	OK															
111	CB	GROUT STRUCTURE						1									
112	CB	OK															
113	CB	RE-RING	B	1		0.8					6	10		10	14	2	1
114	MH	GROUT STRUCTURE						1									
115	MH	OK															
116	MH	RE-RING	A-7D	1		0.4									32	7	2
117	CB	OK															
118A	MH	OK															
118	MH	RE-RING	A-7D	1		0.8									32	7	2
119	MH	RE-RING	A-7D	1		0.7									32	7	2
120	MH	RE-RING	A-7D	1		0.7									32	7	2
121	CB	RE-RING	B	1		0.6					6	10		10	14	2	1
122	CB	RE-RING	B	1		0.6					6	10		10	14	2	1
123	MH	GROUT STRUCTURE						1									
124	MH	OK															
125	CB	RE-RING	B	1		0.9					6	10		10	14	2	1
125A	MH/SAN	OK															
126	CB	OK															
127	CB	RE-RING	B	1		0.4					6	10		10	14	2	1
127A	CB	RE-RING	B	1		0.9					6	10		10	14	2	1
129	MH	OK															
130	MH/SAN	OK															
153	MH	OK															
154	CB	OK															
155	MH/SAN	OK															
156	CB	RE-RING	A	1		1.0					6	10		10	14	2	1
157	CB	RE-RING	A	1		0.7					6	10		10	14	2	1
158	CB	GROUT STRUCTURE						1									
159	CB	OK															
160	CB	OK															
161	CB	RE-RING	A	1		0.8					6	10		10	14	2	1
162	CB	GROUT STRUCTURE						1									
163	CB	RE-RING	A	1		0.7					6	10		10	14	2	1
164	CB	RE-RING	A	1		0.6					6	10		10	14	2	1
165	CB	GROUT STRUCTURE						1									
166	CB	GROUT STRUCTURE						1									
167	CB	RE-RING	A	1		0.6					6	10		10	14	2	1
168	CB	RE-RING	A	1		0.4					6	10		10	14	2	1
169	CB	OK															
170	CB	OK															
171	CB	OK															
172	CB	OK															
173	CB	RE-RING	A	1		0.6					6	10		10	14	2	1
174	CB	RE-RING / GROUT STRUCTURE	A	1		0.6		1			6	10		10	14	2	1
175	CB	RE-RING	A	1		0.8					6	10		10	14	2	1

NO	DATE	BY	CKD	APPR	REVISION	\$DATES	\$TIMES
NAME: \$DGN\$							

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CHECKED BY MJJ DATE 02/03/2017



ANOKA COUNTY  
HIGHWAY DEPT.

STATE AID PROJECT 002-651-008

TABLATIONS

Sheet 3 of 32 Sheets

\$USER\$


**STORM DRAINAGE TAB**

NUMBER	TYPE	ACTION	NEW CASTING	FURNISH AND INSTALL CASTING ASSEMBLY	STRUCTURE TYPE	EXISTING RING HIEGHT	REMOVE DRAINAGE STRUCTURE	GROUT CATCH BASIN OR MANHOLE	DRAINAGE STRUCTURE H	DRAINAGE STRUCTURE 48-4020	SAWING CONCRETE PAVEMENT (FULL DEPTH)	REMOVE CURB & GUTTER	CONCRETE CURB & GUTTER DESIGN B612	CONCRETE CURB & GUTTER DESIGN B618	SAWING PAVEMENT (FULL DEPTH)	REMOVE BITUMINOUS PAVEMENT	TYPE SP 12.5 BIT MIXTURE FOR PATCHING
						LIN FT	EACH	EACH	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ YD	TON
176	CB	RE-RING	B	1		1.1					6	10		10	14	2	1
177	MH	RE-RING	A-7D	1		0.6									32	7	2
178	CB	GROUT STRUCTURE						1									
179	CB	GROUT STRUCTURE						1									
180	CB	RE-RING	B	1		1.2					6	10		10	14	2	1
181	MH/SAN	RE-RING	A-7D	1		0.4									32	7	2
182	CB	OK															
183	MH/SAN	RE-RING	A-7D	1		0.3									32	7	2
184	CB	OK															
185	CB	GROUT STRUCTURE						1									
186	CB	GROUT STRUCTURE						1									
187	CB	OK															
188	CB	OK															
189	CB	RE-RING	A	1		0.6					6	10	10		14	2	1
190	CB	RE-RING	A	1		0.9					6	10	10		14	2	1
191	CB	OK															
192	CB	RE-RING	A	1		1.4					6	10	10		14	2	1
193	CB	OK															
194	CB	OK															
195	CB	OK															
196	MH/SAN	RE-RING	A-7D	1		0.6									32	7	2
197	CB	RE-RING	A	1		0.9					6	10	10		14	2	1
198	CB	RE-RING	A	1		0.9					6	10	10		14	2	1
199	CB	RE-RING	B	1		1.1					6	10		10	14	2	1
200	MH/SAN	RE-RING	A-7D	1		0.3									32	7	2
201	CB	GROUT STRUCTURE						1									
202	CB	RE-RING	A	1		0.9					6	10	10		14	2	1
203	CB	RE-RING	B	1		0.4					6	10		10	14	2	1
204	MH/SAN	RE-RING	A-7D	1		0.2									32	7	2
205	CB	RE-RING	A	1		1.1					6	10	10		14	2	1
206	MH/SAN	RE-RING	A-7D	1		0.3									32	7	2
207	CB	OK															
208	MH/SAN	RE-RING	A-7D	1		0.4									32	7	2
209	CB	RE-RING	A	1		1.1					6	10	10		14	2	1
210	CB	RECONSTRUCT	A	1	48-4020		1			2.5	6	10	10		14	2	1
211	CB	RECONSTRUCT	B	1	H		1		2.1		6	10		10	14	2	1
419	MH	GROUT STRUCTURE						1									
<b>TOTALS</b>				48			2	18	2.1	2.5	216	360	180	180	888	156	60

**CASTING ASSEMBLIES SUMMARY**

ASSEMBLY	RING OR FRAME CASTING	COVER OR GRATE CASTING	DESCRIPTION	NOTES	QUANTITY
A-7D	700-7	716	STD. PLATE: 4101D, 4110F	CASTING COVER STAMPED "STORM SEWER"	5
A-7D	700-7	716	STD. PLATE: 4101D, 4110F	CASTING COVER STAMPED "SANITARY SEWER"	7
A				SEE DETAILS - SHEET 7	19
B				SEE DETAILS - SHEET 7	17

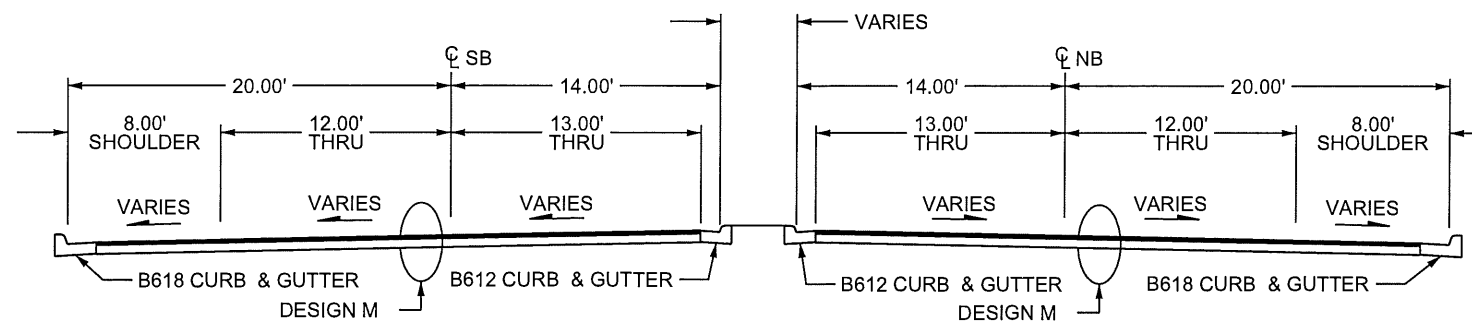
ALL CASTING HEIGHTS ARE TO BE VERIFIED IN THE FIELD.  
ALL MANHOLE COVERS SHALL BE STAMPED AS STORM SEWER OR SANITARY SEWER.

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NO	DATE	BY	CKD	APPR	REVISION	\$DATE\$	\$TIME\$	NAME: \$DGN\$									

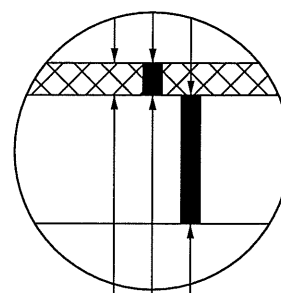
# UNIVERSITY AVE (CSAH 51)

## TYPICAL MAINLINE

11+25 - 66+00 (TURN LANES EXEMPT)



## DESIGN M MILL SECTION



2.0" MILL BITUMINOUS  
2.0" BITUMINOUS WEAR (SPWEB440C)  
REMAINING BITUMINOUS

### RIGHT TURN LANE

20+20 - 31+10  
35+80 - 52+70  
64+80 - 66+00

### UNIVERSITY AVE (CSAH 51)

#### TYPICAL LSB TURN LANES

### LEFT TURN LANE

35+90 - 40+50  
47+00 - 51+70  
65+00 - 66+00

### LEFT TURN LANE

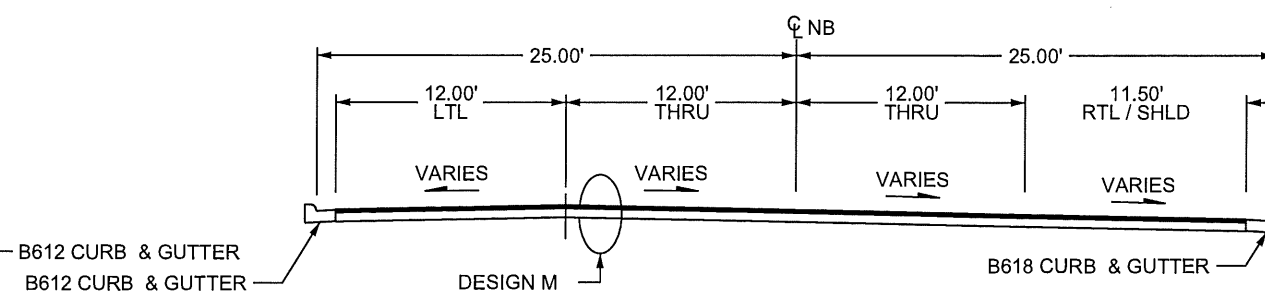
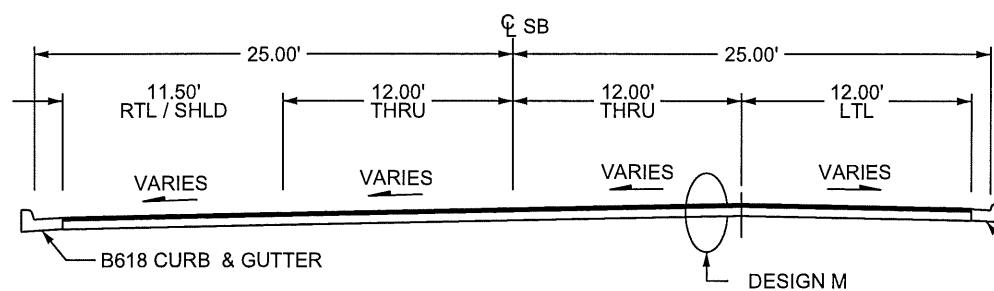
30+30 - 34+80  
41+40 - 46+00  
60+60 - 64+20

### UNIVERSITY AVE (CSAH 51)

#### TYPICAL LNB TURN LANES

### RIGHT TURN LANE

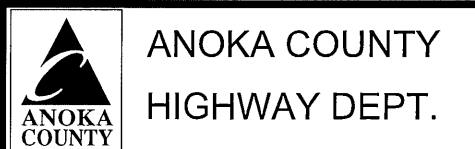
23+30 - 27+30  
30+10 - 34+90  
44+15 - 55+00  
61+95 - 66+00



NO	DATE	BY	CKD	APPR	REVISION	\$DATE\$	\$TIMES\$

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CHECKED BY: MJJ DATE: 02/03/2017



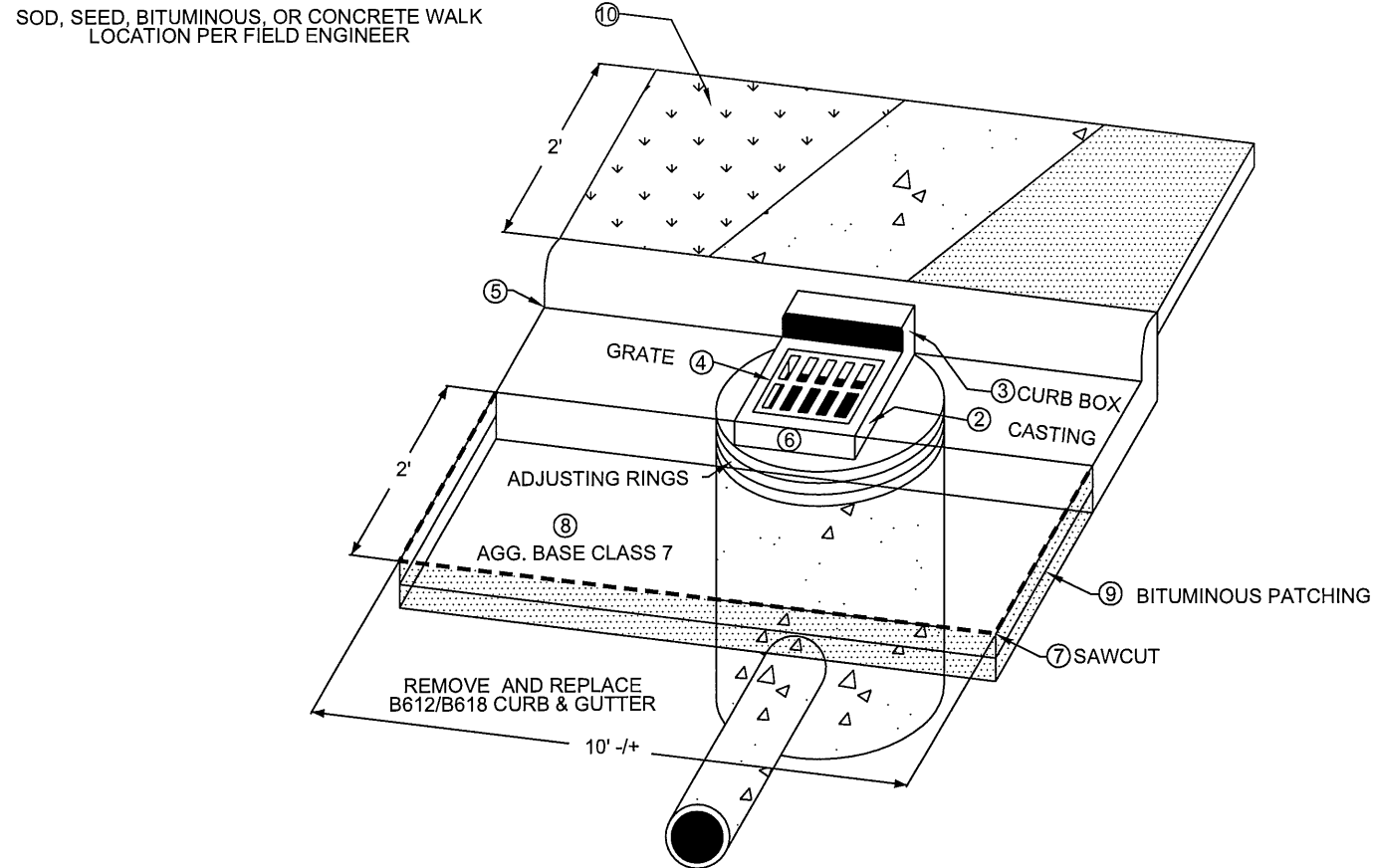
STATE AID PROJECT 002-651-008

TYPICAL SECTIONS  
Sheet 5 of 32 Sheets

\$\$\$USER\$\$\$

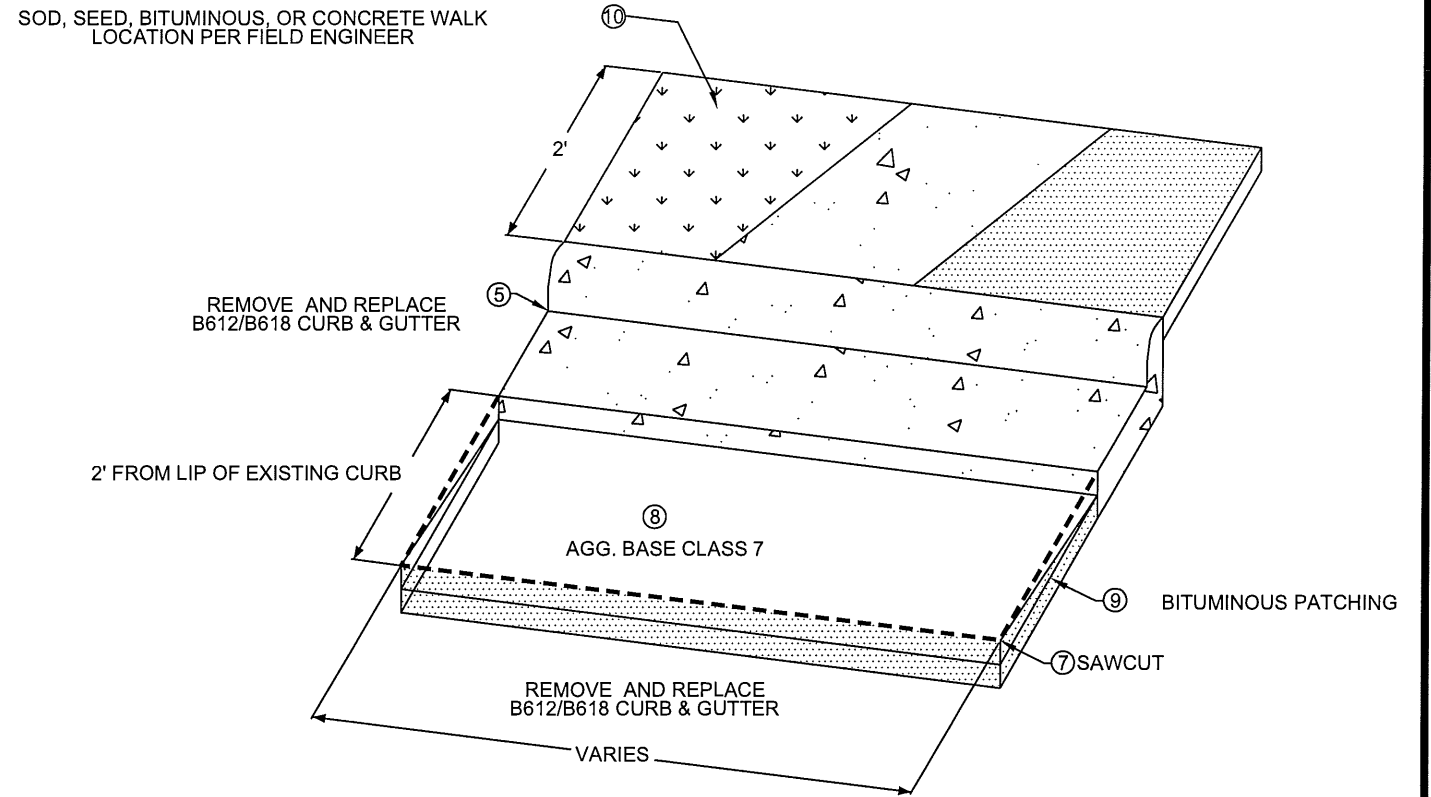
### CATCH BASIN DETAIL

SEE STRUCTURE TAB FOR LOCATION  
(PAGE 3)



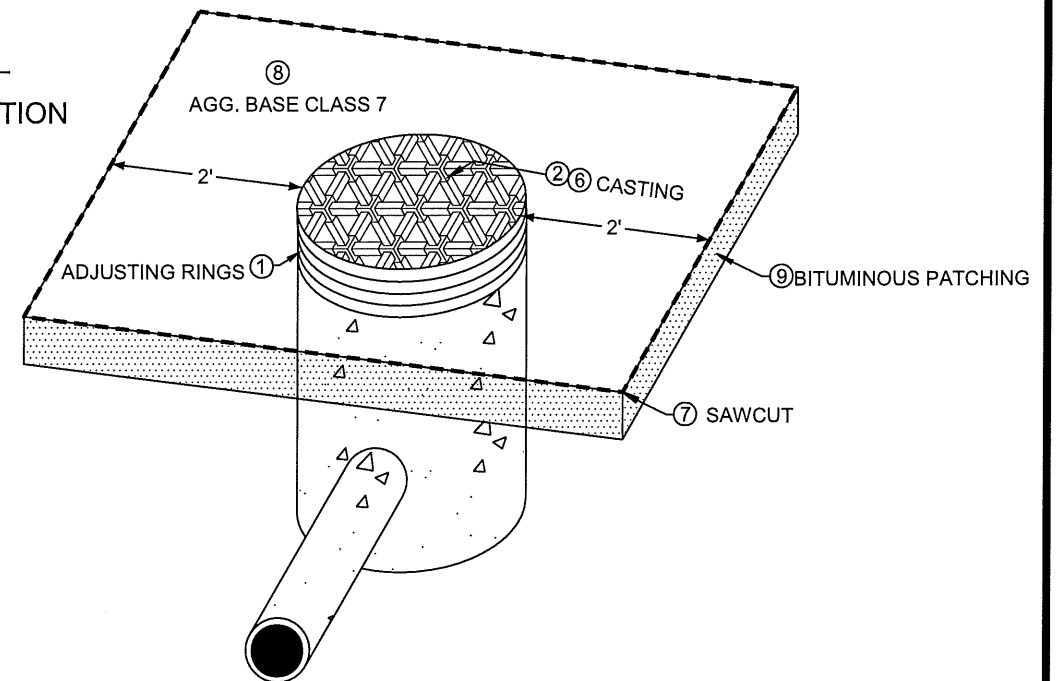
### NEW CURB DETAIL

SEE PLAN FOR LOCATION



### MANHOLE DETAIL

SEE STRUCTURE TAB FOR LOCATION  
(PAGE 3)



### NOTES

FOR TRAFFIC CONTROL AT CATCH BASIN AND MANHOLE REPAIRS REFER TO THE MINNESOTA MANUAL ON TEMPORARY TRAFFIC CONTROL LAYOUTS FIELD MANUAL.

- ① CONCRETE ENCASED CONCRETE ADJUSTING RINGS STANDARD PLATE 4026A
- ② RING AND FRAME CASTING; REFERENCE CASTING ASSEMBLIES SUMMARY CHART FOR CASTING TYPE
- ③ CURB BOX MATCHES CASTING REFERENCE CHART FOR CASTING TYPE
- ④ GRATE CASTING; REFERENCE CASTING ASSEMBLIES SUMMARY CHART FOR CASTING TYPE
- ⑤ CONCRETE CURB AND GUTTER DESIGN B STANDARD PLATE 7100H
- ⑥ INSTALLATION OF CATCH BASIN OR MANHOLE CASTINGS; REFERENCE STANDARD PLATE PER TYPE OF CASTING
- ⑦ SAWCUT BITUMINOUS PAVEMENT / CONCRETE CURB FULL DEPTH.
- ⑧ ADD AND COMPACT AGGREGATE BASE CLASS 7 AROUND REPAIRED STRUCTURE. ITEM INCIDENTAL TO ENTIRE STRUCTURE REPAIR
- ⑨ REMOVE VARIABLE DEPTH BITUMINOUS, PATCH WITH 2, 3" LIFTS OF BITUMINOUS, TOP LIFT SHOULD TAPER TO BOTTOM LIFT AT CURB.
- ⑩ REPLACE DISTURBED AREA BEHIND CATCH BASIN WITH EITHER SOD (RESIDENTIAL AREAS), EROSION CONTROL BLANKET, BITUMINOUS, OR CONCRETE

NO	DATE	BY	CKD	APPR	REVISION	\$DATES	\$TIMES

NAME: \$DGN\$

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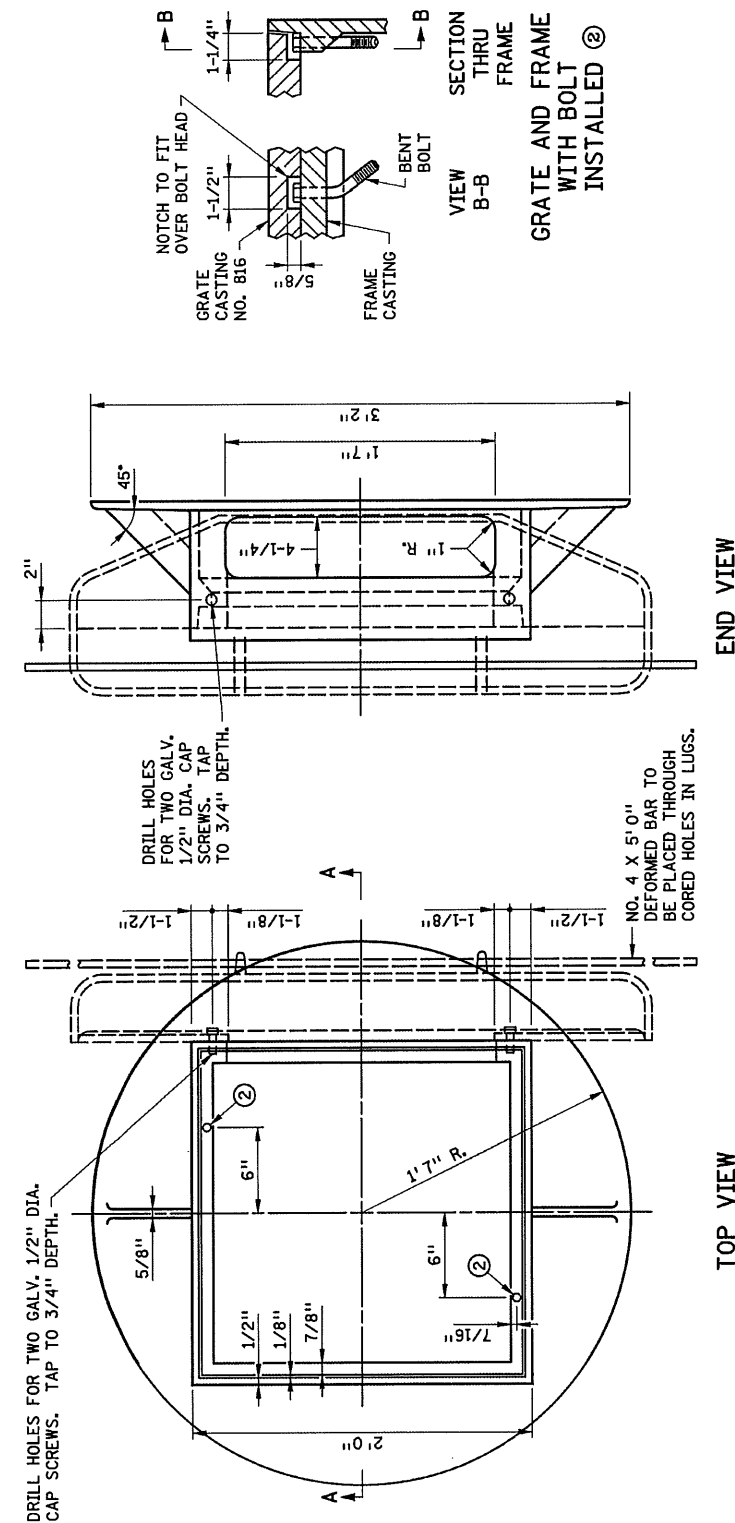
ANOKA COUNTY  
HIGHWAY DEPT.

STATE AID PROJECT 002-651-008

DETAILS

Sheet 6 of 32 Sheets

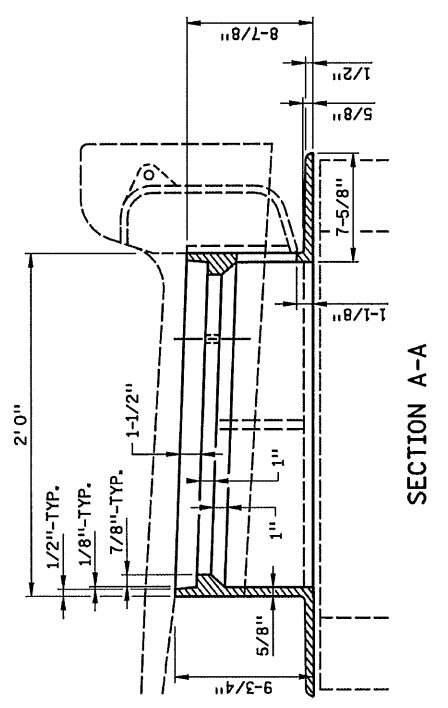
FRAME RING AND CASTING TYPE A



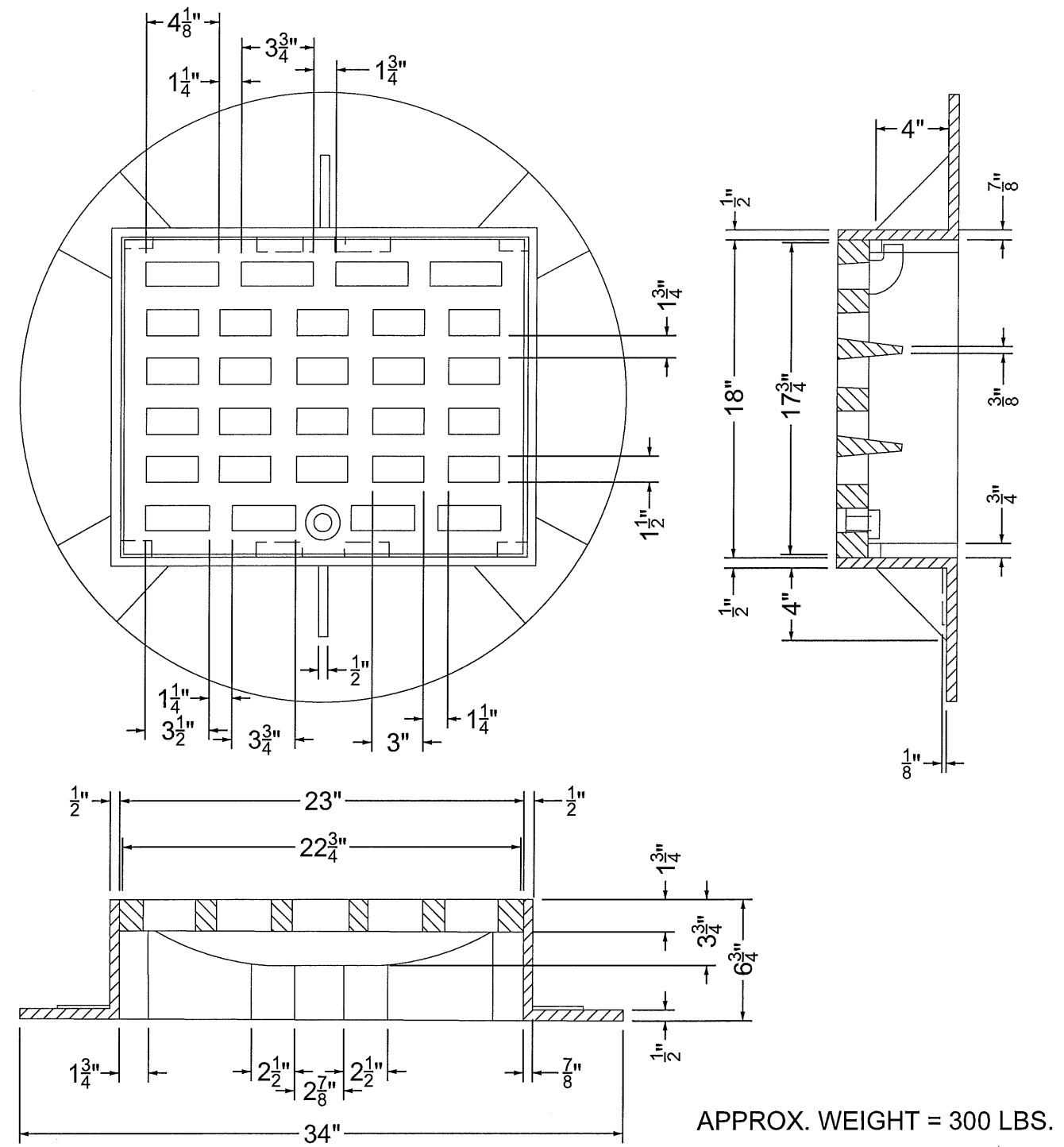
CASTINGS USED FOR ASSEMBLY  
 GRATE NO. 816 (MNDOT STD PLATE 4154B)  
 CURB BOX ① NO. 823A (MNDOT STD PLATE 4160) OR

NOTES:

- USE 1/4" FILLETS IN ALL CORNERS. SEE MNDOT STANDARD PLATE 7111 FOR INSTALLATION REQUIREMENTS.
- APPLIES TO DESIGN B OR V CURB AND GUTTER.
- AT LOCATIONS INDICATED IN TOP VIEW, PROVIDE 9/16" DIA. HOLES WHEN GRATE NO. 816 (MNDOT STD PLATE 4154) IS USED WITH THIS FRAME. FIELD PLACE 1/2" DIA X 4" LONG GALV BOLT IN UP STREAM SIDE AND BENT UNDERSIDE TO PREVENT REMOVAL. THIS WILL PREVENT GRATE NO. 816 (MNDOT STD PLATE 4154) FROM BEING PLACED IN WRONG AND NOT BEING BICYCLE SAFE.



FRAME RING AND CASTING TYPE B



NOTE: THE CONTRATOR SHALL TAPER THE LIP OF CONCRETE CURB AND GUTTER FROM THE LIP OF THE ADJACENT CURB LINE TO THE LIP OF THE CASTING OVER A DISTANCE OF 3' (ON EACH SIDE OF THE CASTING). THIS WORK SHALL BE INCIDENTAL TO THE CONCRETE CURB & GUTTER PAY ITEMS.

NO	DATE	BY	CHKD	APPR	REVISION	\$DATE\$	\$TIME\$

NAME: SDGNS

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 DESIGN BY: KPR DATE: 03/03/2017  
 CHECKED BY: MJJ DATE: 03/07/2017



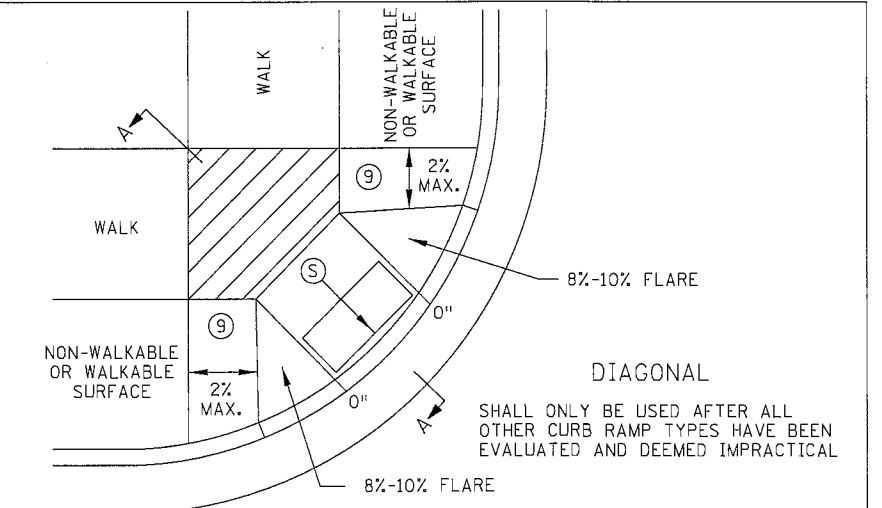
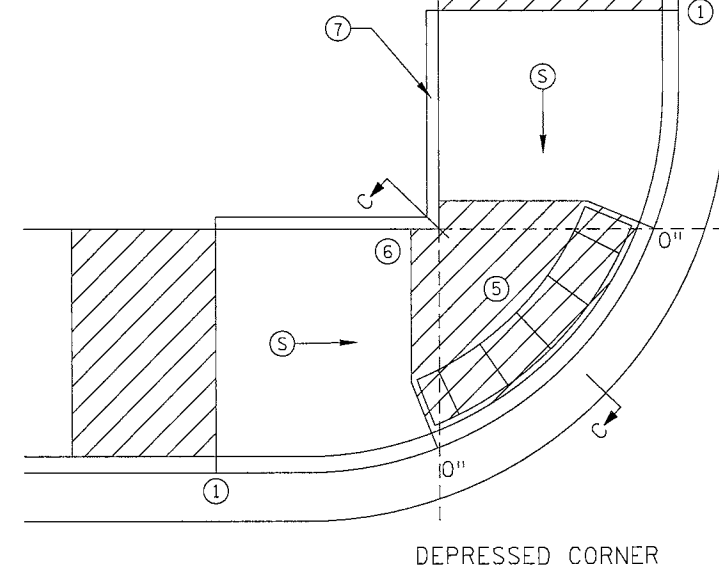
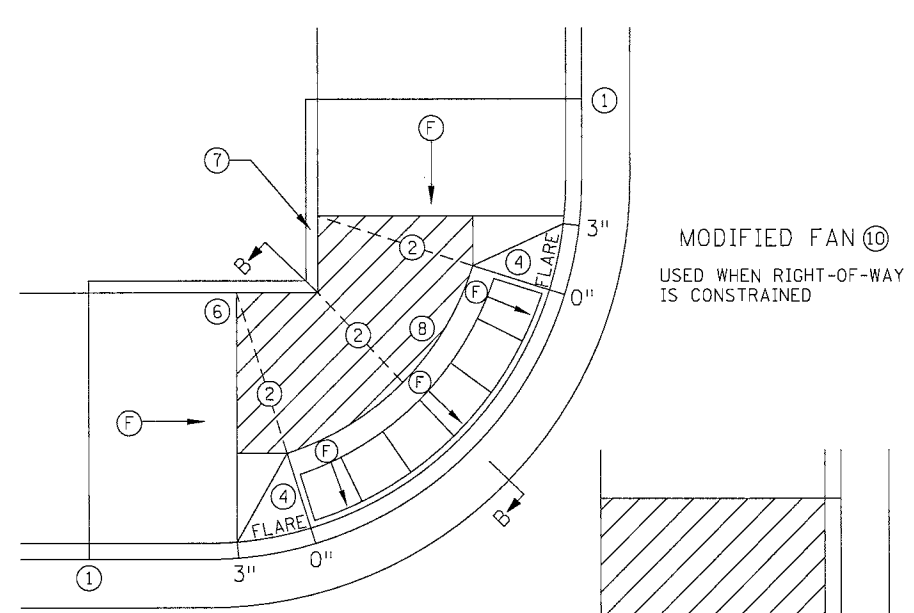
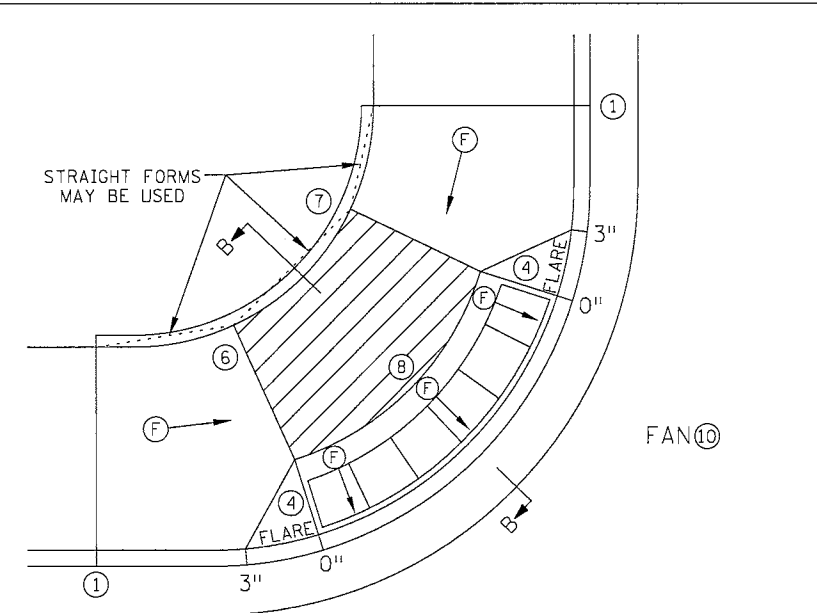
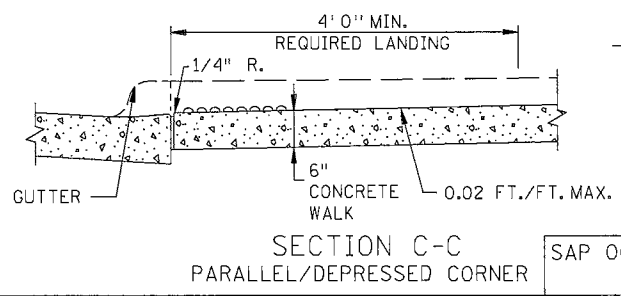
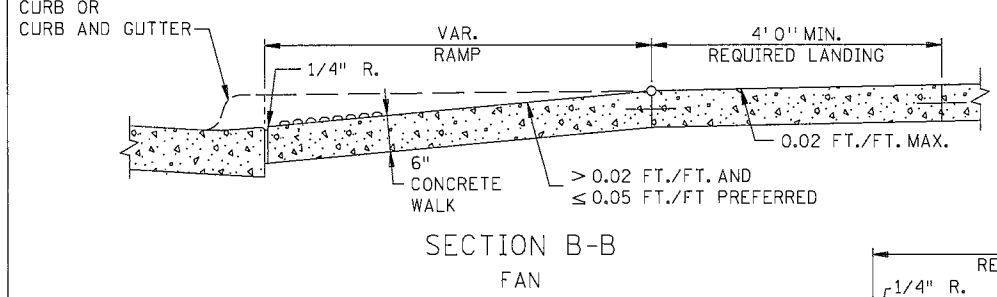
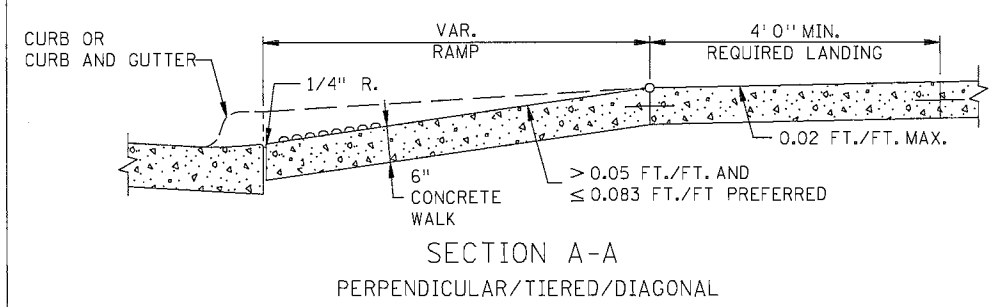
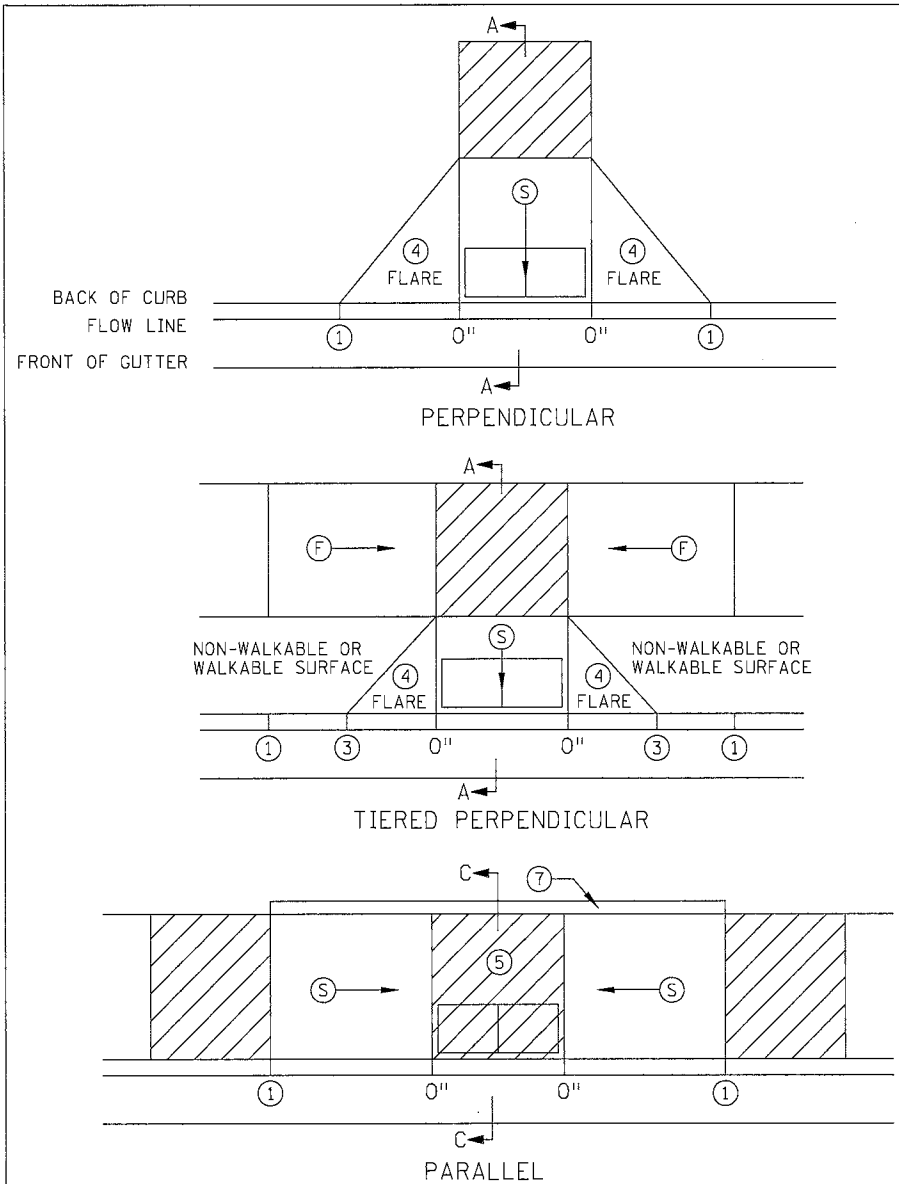
ANOKA COUNTY  
 HIGHWAY DEPT.

STATE AID PROJECT 002-651-008

DETAILS  
 Sheet 7 of 32 Sheets

PLOTTED/REVISED:  
03/30/2017

DISTRICT #:   
USER NAME: dffrey   
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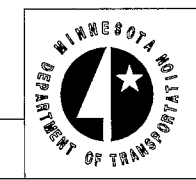


- NOTES:
- LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE GREATER THAN 2%.
  - INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.
  - SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL RUNNING SLOPE IS GREATER THAN 5.0%.
  - CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR. 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.
  - ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL. THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH. (EXCEPT AS STATED IN 6 BELOW.)
  - TO ENSURE INITIAL RAMPS AND INITIAL LANDINGS ARE PROPERLY CONSTRUCTED, LANDINGS SHALL BE CAST SEPARATELY. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 AND THE ADA SPECIAL PROVISIONS - PROSECUTION OF WORK (ADA).
  - TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.
  - WHEN THE BOULEVARD IS 4' WIDE OR LESS, THE TOP OF CURB TAPER SHALL MATCH THE RAMP SLOPES TO REDUCE NEGATIVE BOULEVARD SLOPES FROM THE TOP BACK OF CURB TO THE PAR.
  - ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.
  - 4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER ENTIRE WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK. DETECTABLE WARNING SHOULD BE 6" LESS THAN THE PAR/TRAIL WIDTH. ARC LENGTH OF RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.
  - RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB. RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.
- MATCH FULL HEIGHT CURB.
  - 4' MINIMUM DEPTH LANDING REQUIRED ACROSS TOP OF RAMP.
  - 3" HIGH CURB WHEN USING A 3' LONG RAMP, 4" HIGH CURB WHEN USING A 4' LONG RAMP.
  - SEE SHEET 4 OF 6, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS, WHEN INITIAL LANDING IS AT FULL CURB HEIGHT.
  - DETECTABLE WARNINGS MAY BE PART OF THE 4' X 4' MIN. LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.
  - THE GRADE BREAK SHALL BE PERPENDICULAR TO THE BACK OF WALK. THIS WILL ENSURE THAT THE GRADE BREAK IS PERPENDICULAR TO THE DIRECTION OF TRAVEL. (TYPICAL FOR ALL)
  - WHEN ADJACENT TO GRASS, GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.
  - A 7' MIN TOP RADIUS GRADE BREAK REQUIRED TO BE CONSTRUCTIBLE.
  - PAVE FULL WALK WIDTH.
  - "S" SLOPES ON FANS SHALL ONLY BE USED WHEN ALL OTHER FEASIBLE OPTIONS HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.

LEGEND	
THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.	
(S)	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
(F)	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
[Hatched Box]	LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.
X"	CURB HEIGHT

REVISION:  
APPROVED: JANUARY 23, 2017  
OPERATIONS ENGINEER

SAP 002-651-008



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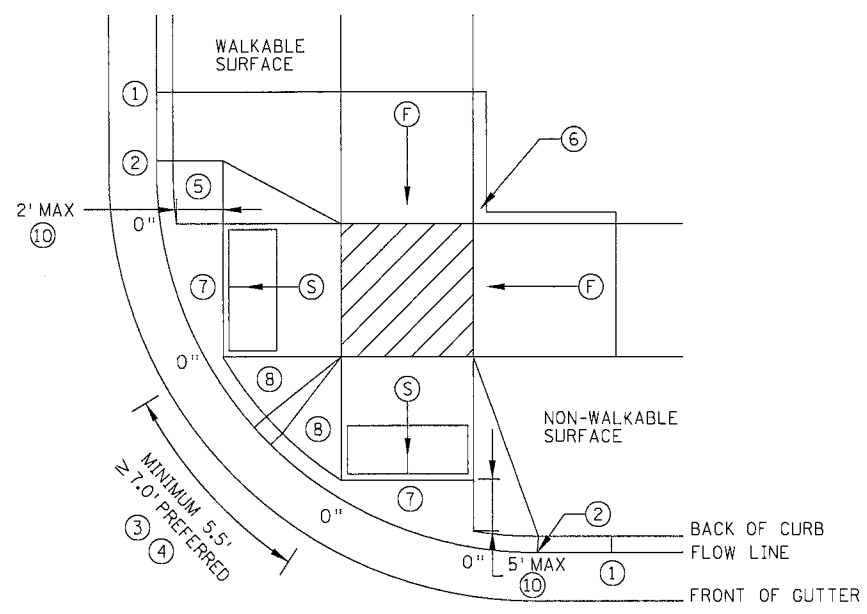
REVISED:  
APPROVED:  
1-23-2017

PEDESTRIAN CURB RAMP DETAILS (1 OF 6)  
STANDARD PLAN 5-297.250  
8 OF 32

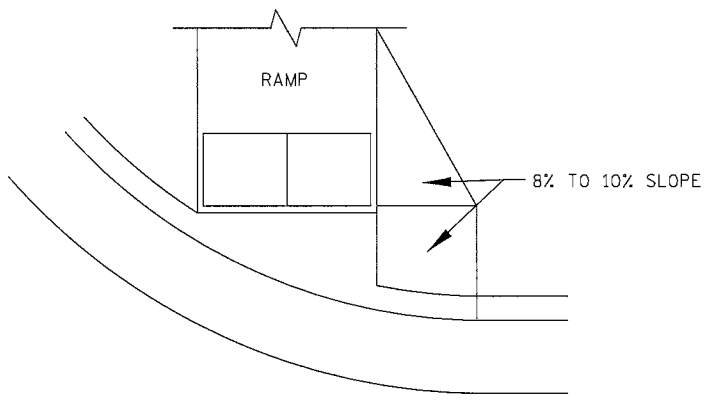


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03/30/2017

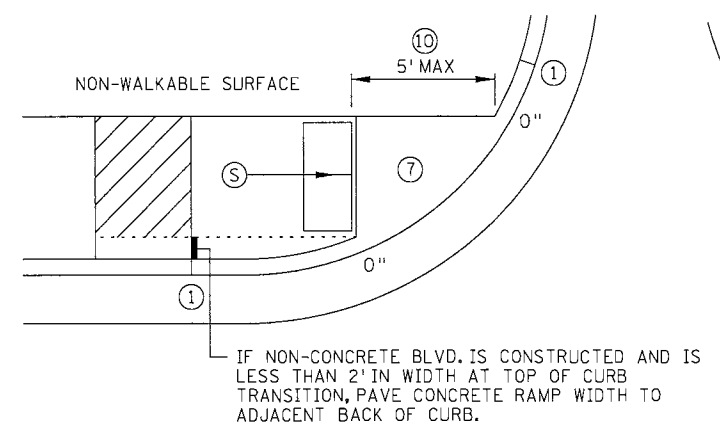
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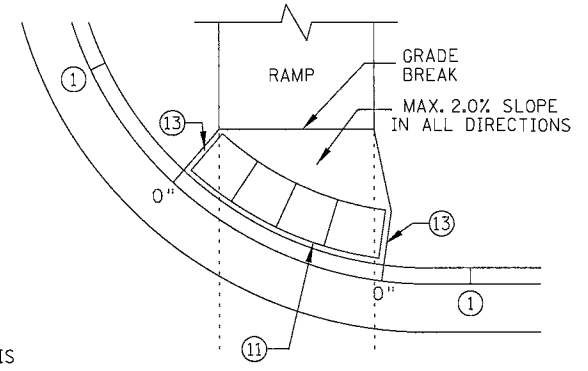
COMBINED DIRECTIONAL ⑨



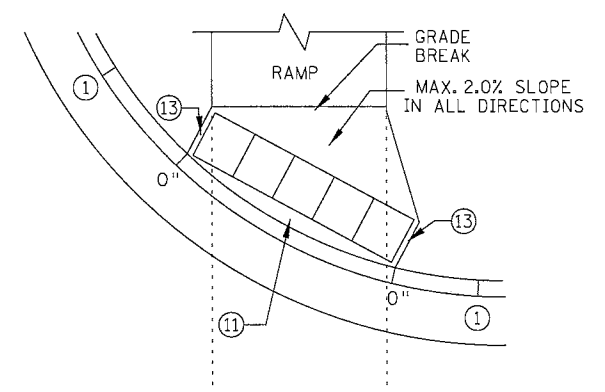
DIRECTIONAL RAMP WALKABLE FLARE



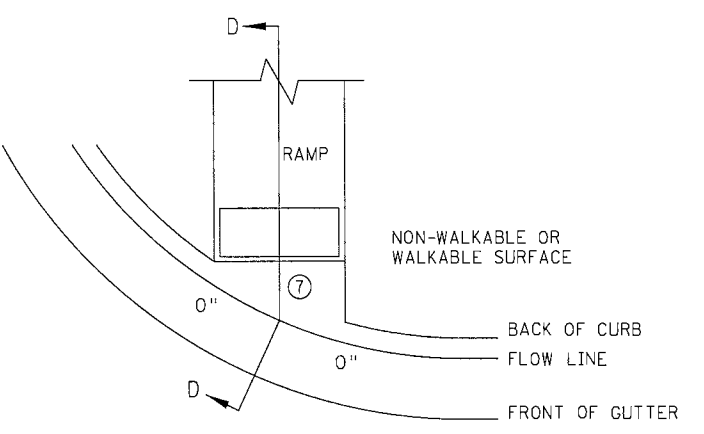
STANDARD ONE-WAY DIRECTIONAL ⑨



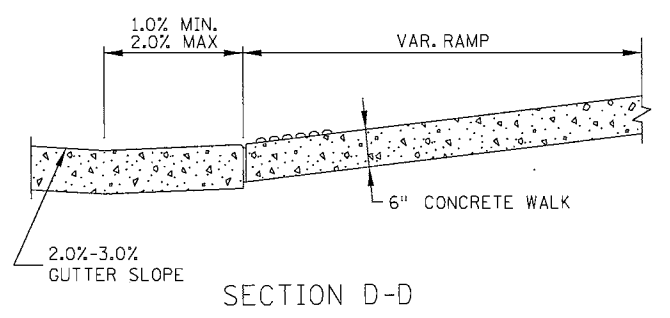
DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫



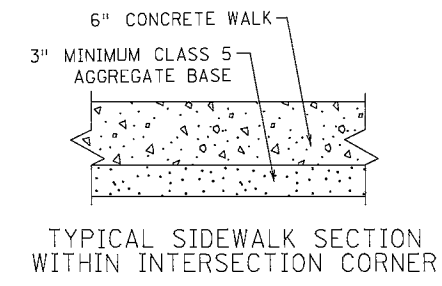
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB



CURB FOR DIRECTIONAL RAMPS ⑭



SECTION D-D



TYPICAL SIDEWALK SECTION WITHIN INTERSECTION CORNER

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR. 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOP GRADE BREAK OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL. THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH.

TO ENSURE INITIAL RAMPS AND INITIAL LANDINGS ARE PROPERLY CONSTRUCTED, LANDINGS SHALL BE CAST SEPARATELY. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 AND THE ADA SPECIAL PROVISION (PROSECUTION OF WORK).

TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

WHEN THE BOULEVARD IS 4' WIDE OR LESS, THE TOP OF CURB TAPER SHALL MATCH THE RAMP SLOPES TO REDUCE NEGATIVE BOULEVARD SLOPES FROM THE TOP BACK OF CURB TO THE PAR.

ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER ENTIRE WIDTH OF SHARED-USE PATH AND THE ENTIRE PAR WIDTH OF THE WALK. DETECTABLE WARNING SHOULD BE 6" LESS THAN THE PAR/PATH WIDTH. ARC LENGTH OF RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.

RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB. SEE NOTES ⑩ & ⑪ FOR INFORMATION REGARDING RECTANGULAR DETECTABLE WARNING PLACEMENT.

- ① MATCH FULL CURB HEIGHT.
- ② 3" HIGH CURB WHEN USING A 3' LONG RAMP  
4" HIGH CURB WHEN USING A 4' LONG RAMP.
- ③ 3" MINIMUM CURB HEIGHT (5.5' MIN. DISTANCE REQUIRED BETWEEN DOMES)  
4" PREFERRED (7' MIN. DISTANCE REQUIRED BETWEEN DOMES).
- ④ THE "BUMP" IN BETWEEN THE RAMPS SHOULD NOT BE IN THE PATH OF TRAVEL FOR COMBINED DIRECTIONAL RAMPS. IF THIS OCCURS MODIFY THE RAMP LOCATION OR SWITCH RAMP TO A FAN/DEPRESSED CORNER.
- ⑤ WHEN USING CONCRETE PAVED FLARES ON THE OUTSIDE OF DIRECTIONAL RAMPS, AND ADJACENT TO A WALKABLE SURFACE, DIRECTIONAL RAMP FLARES SHOULD BE USED. SEE THE DETAIL ON THIS SHEET.
- ⑥ GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.
- ⑦ MAX. 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK AND DRAIN TO FLOW LINE. SHALL BE CONSTRUCTED INTEGRAL WITH CURB AND GUTTER.
- ⑧ 8% TO 10% WALKABLE FLARE.
- ⑨ PLACE DOMES AT THE BACK OF CURB WHEN ALLOWABLE SETBACK CRITERIA IS EXCEEDED.
- ⑩ FRONT EDGE OF DETECTABLE WARNING SHALL BE SET BACK 2' MAXIMUM WHEN ADJACENT TO WALKABLE SURFACE, AND 5' MAXIMUM WHEN ADJACENT TO NON-WALKABLE SURFACE WITH ONE CORNER SET 3" FROM BACK OF CURB. A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.
- ⑪ RECTANGULAR DETECTABLE WARNINGS MAY BE SETBACK UP TO 9" FROM THE BACK OF CURB WITH CORNERS SET 3" FROM BACK OF CURB. IF 9" SETBACK IS EXCEEDED USE RADIAL DETECTABLE WARNINGS.
- ⑫ FOR DIRECTIONAL RAMPS WITH THE DETECTABLE WARNINGS PLACED AT THE BACK OF CURB, THE DETECTABLE WARNINGS SHALL COVER THE ENTIRE WIDTH OF THE WALK/PATH. THIS ENSURES A DETECTABLE EDGE AND HELPS ELIMINATE THE CURB TAPER OBSTRUCTING THE PATH OF PEDESTRIAN TRAVEL.
- ⑬ THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE BACK OF CURB. MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.
- ⑭ TO BE USED FOR ALL DIRECTIONAL RAMPS, EXCEPT WHERE DOMES ARE PLACED ALONG THE BACK OF CURB.

LEGEND	
THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.	
Ⓢ	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
Ⓣ	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
	LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.
X"	CURB HEIGHT

REVISION:  
APPROVED: JANUARY 23, 2017  
OPERATIONS ENGINEER

SAP 002-651-008

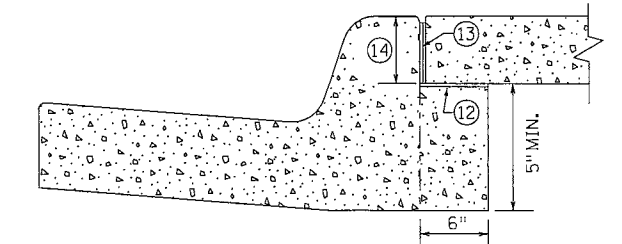
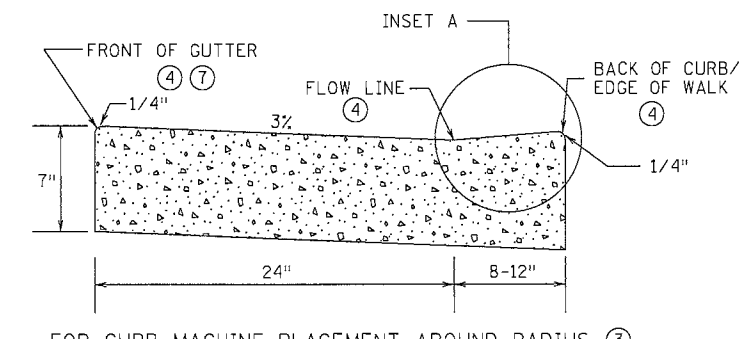
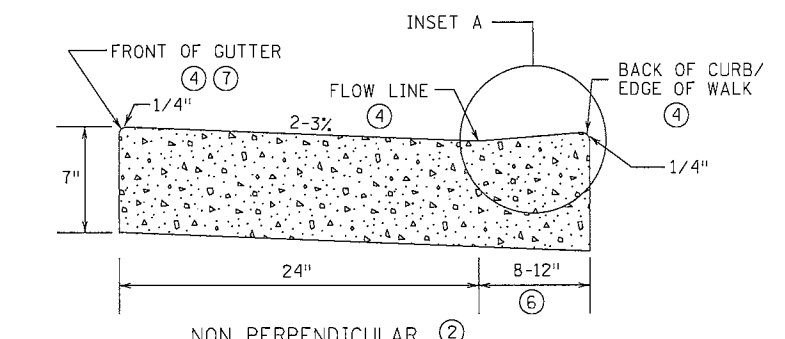
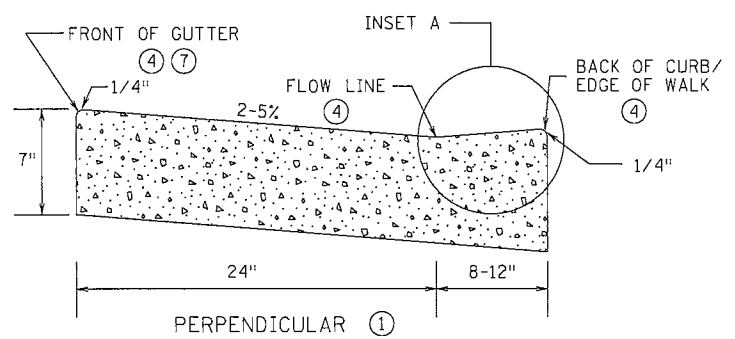
MINNESOTA DEPARTMENT OF TRANSPORTATION  
Tom Jahn  
STATE DESIGN ENGINEER

REVISED:  
APPROVED:  
1-23-2017

PEDESTRIAN CURB RAMP DETAILS (2 OF 6)  
STANDARD PLAN 5-297.250  
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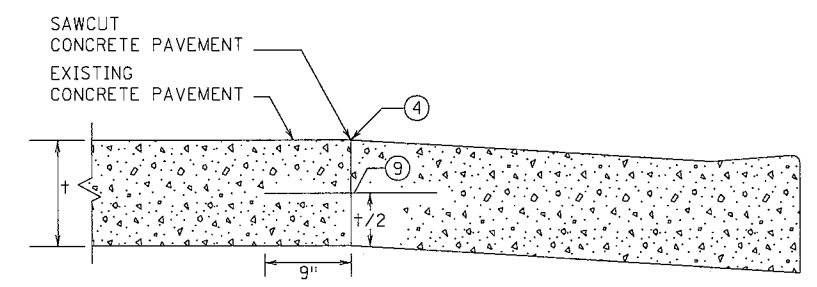
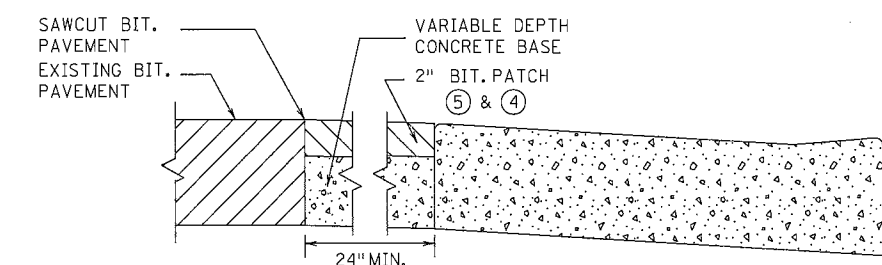
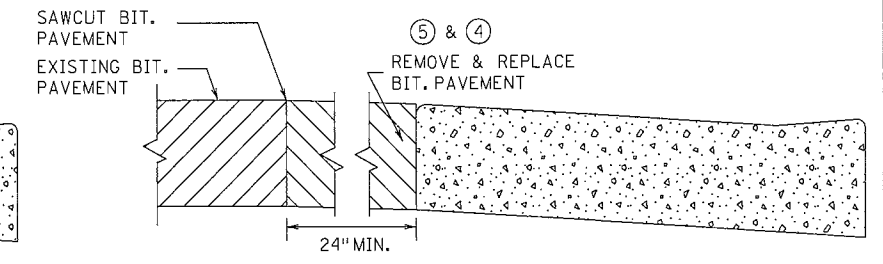
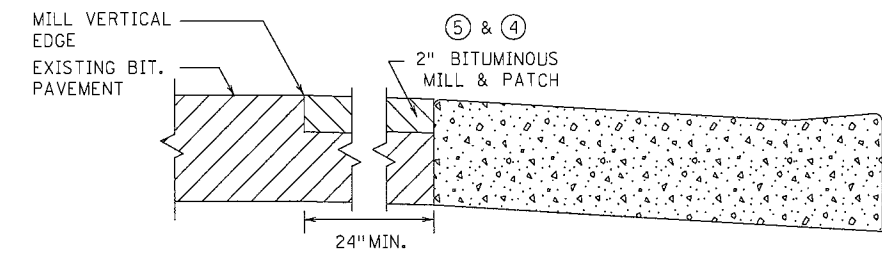
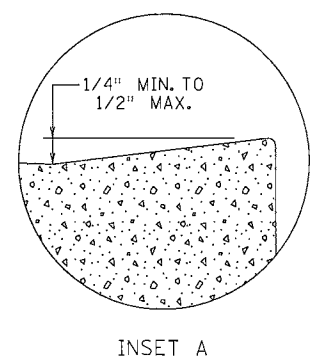
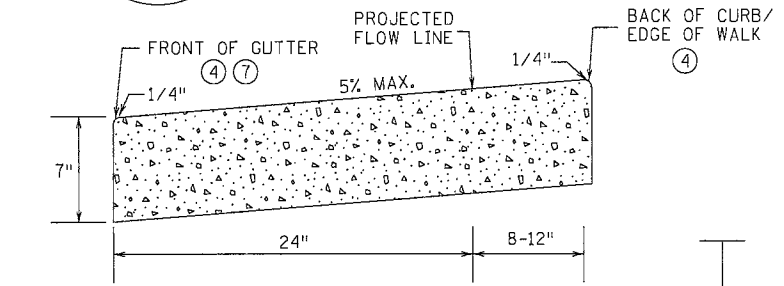
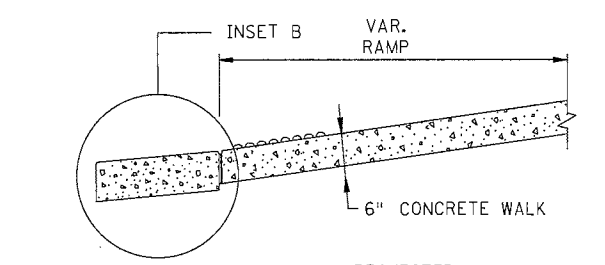
PLOTTED/REVISED:  
03/30/2017

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OPTIONAL SILL CURB WHEN SIDEWALK IS AT BACK OF CURB  
CONCRETE SILL TO BE USED ONLY WHEN SPECIFIED IN THE PLAN.

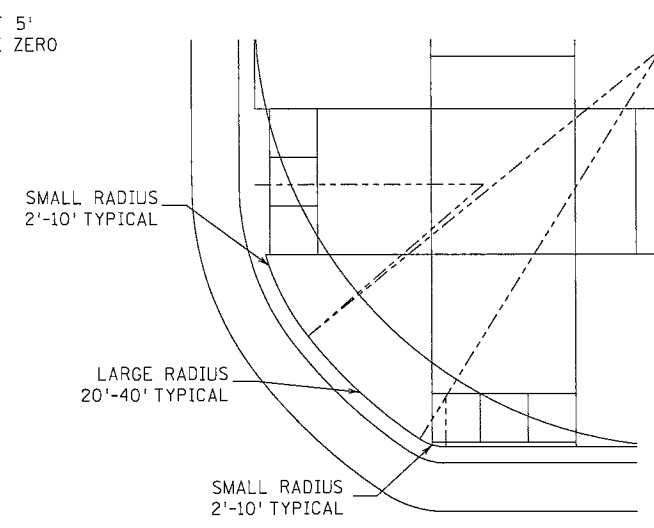
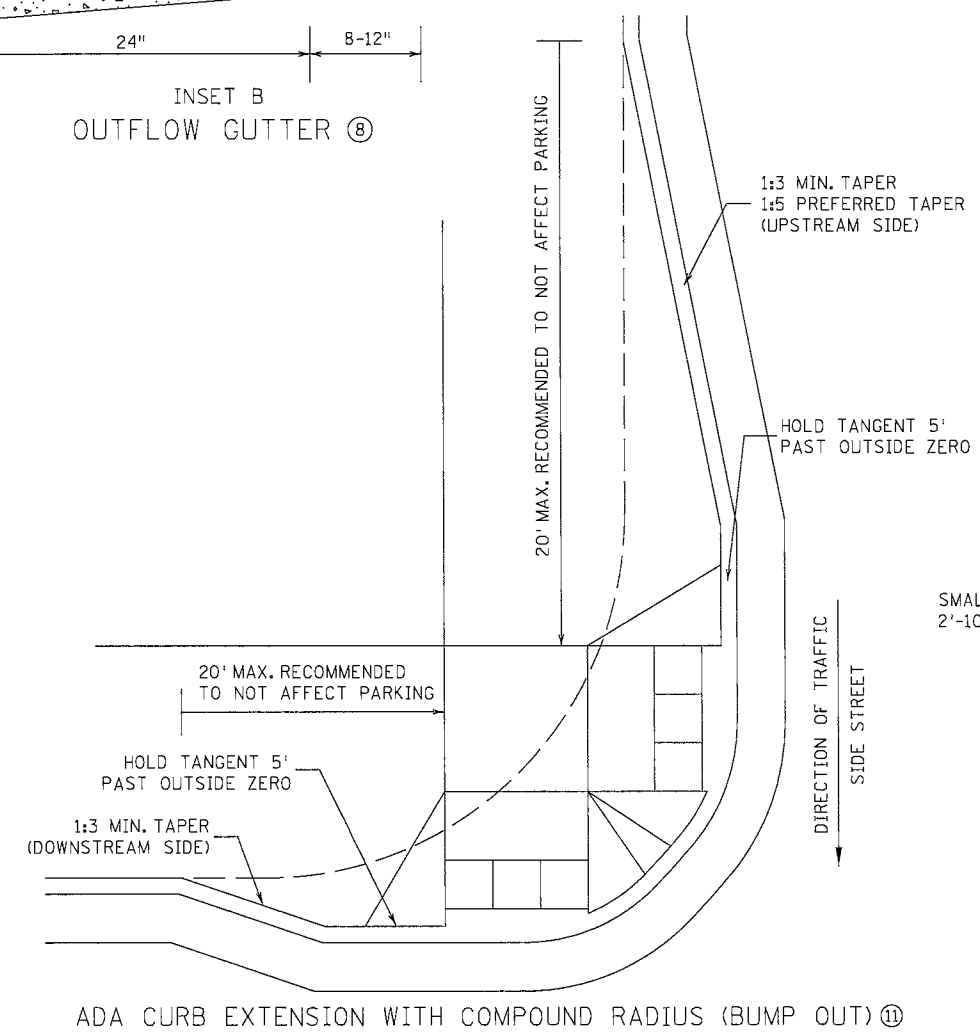
PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL



ONLY ALLOWED PER ENGINEER'S APPROVAL

PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER  
FOR USE ON CURB RAMP RETROFITS

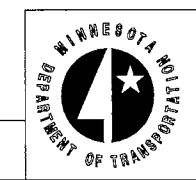
- NOTES:
- POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM. NO PONDING SHALL BE PRESENT IN THE PAR.
  - ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.
  - ① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMP.
  - ② FOR USE AT CURB RAMPS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED NON PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: FANS & DEPRESSED CORNERS.
  - ③ BEGIN GUTTER SLOPE TRANSITION 10' OUTSIDE OF ALL CURB RAMPS.
  - ④ THERE SHALL BE NO VERTICAL DISCONTINUITIES GREATER THAN 1/4\".
  - ⑤ ELEVATION CHANGE TAKES PLACE FROM THE EXISTING TO NEW FRONT OF GUTTER. PATCH IS USED TO MATCH THE NEW GUTTER FACE INTO THE EXISTING ROADWAY.
  - ⑥ VARIABLE WIDTH FOR DIRECTIONAL CURB APPLICATIONS. SEE SHEET 2 FOR DIRECTIONAL CURB SLOPE REQUIREMENTS.
  - ⑦ TOP FRONT OF GUTTER SHALL BE CONSTRUCTED FLUSH WITH PROPOSED ADJACENT PAVEMENT ELEVATION. TOP 1.5\" OF THE GUTTER FACE MUST BE A FORMED EDGE. PAR GUTTER SHALL NOT BE OVERLAID.
  - ⑧ SHOULD BE USED AT VERTICALLY CONSTRAINED AREAS WHEN AT A DRAINAGE HIGH POINT OR SUPER ELEVATED ROADWAY SEGMENTS.
  - ⑨ DRILL AND GROUT NO. 4 EPOXY-COATED 18\" LONG TIE BARS AT 30\" CENTER TO CENTER INTO EXISTING CONCRETE PAVEMENT 1' MINIMUM FROM ALL JOINTS.
  - ⑩ HELPS PROVIDE TWO SEPARATE RAMPS, REDUCES THE DOME SETBACK LENGTH AND MINIMIZES DIRECTIONAL CURB. THIS RADIUS DESIGN CLOSELY FOLLOWS THE TURNING VEHICLE PATH WHILE OPTIMIZING CURB RAMP LENGTH.
  - ⑪ CURB EXTENSIONS SHOULD BE USED IN VERTICALLY CONSTRAINED AREAS, USUALLY IN DOWNTOWN ROADWAY SEGMENTS WHERE ON-STREET PARKING IS AVAILABLE. CURB EXTENSIONS SHOULD BE CONSIDERED FOR APS INTERSECTIONS WHERE SPACE IS LIMITED. PUSH BUTTONS MUST MEET APS CRITERIA AS DESCRIBED IN THE PUSH BUTTON LOCATION DETAIL SHEET.
  - ⑫ PLACE BOND BREAKER BETWEEN WALK AND TOP OF SILL.
  - ⑬ 1/2\" PREFORMED JOINT FILLER PER MNDOT SPEC. 3702.
  - ⑭ DIMENSION TO BE SAME AS SIDEWALK THICKNESS, 4\" MIN.



COMBINED DIRECTIONAL (COMPOUND RADIUS)

REVISION:  
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OPERATIONS ENGINEER

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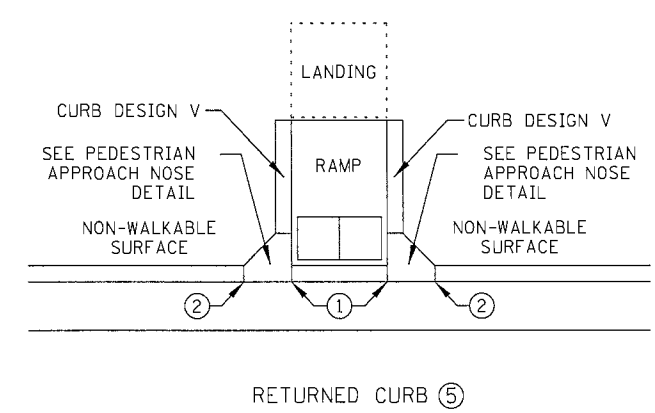
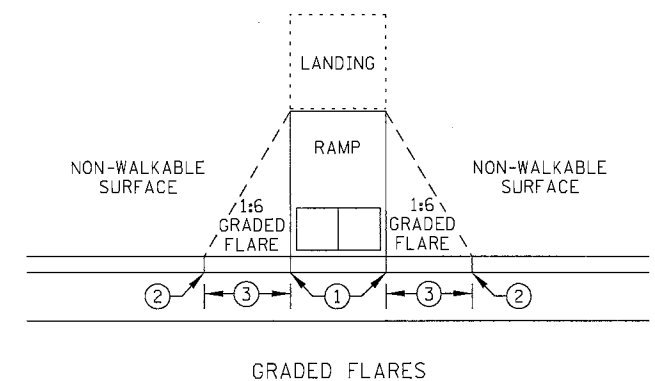
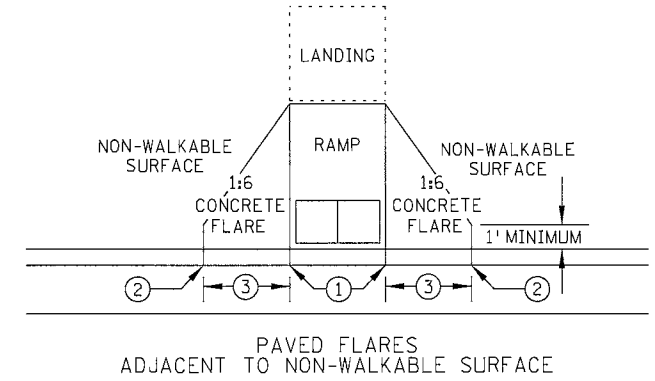
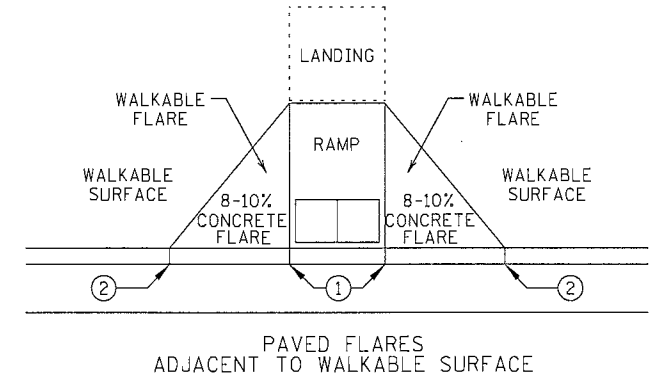
Tom J...  
STATE DESIGN ENGINEER

REVISED:  
APPROVED:  
1-23-2017

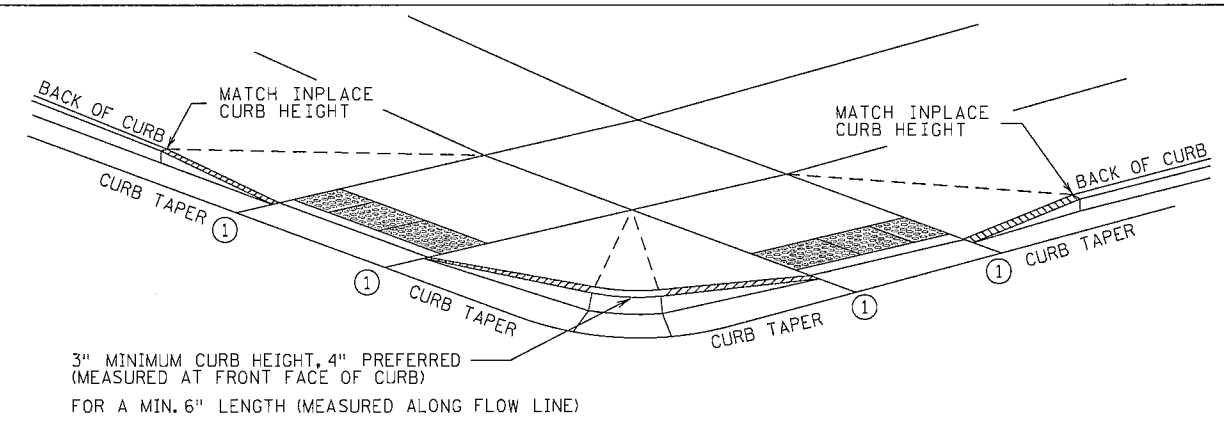
PEDESTRIAN CURB RAMP DETAILS (3 OF 6)  
STANDARD PLAN 5-297.250  
10 OF 32

PLOTTED/REVISED:  
03/30/2017

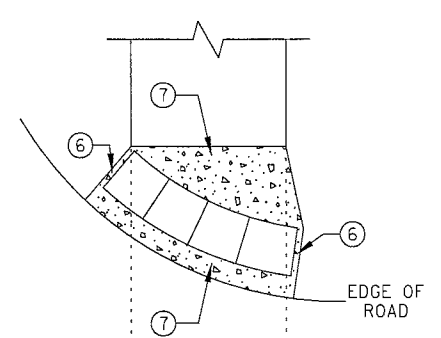
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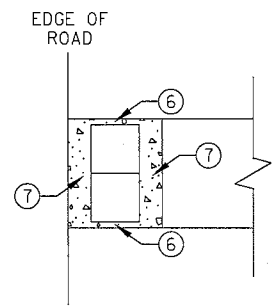
TYPICAL SIDE TREATMENT OPTIONS (4) (11)



DETECTABLE EDGE WITH CURB AND GUTTER

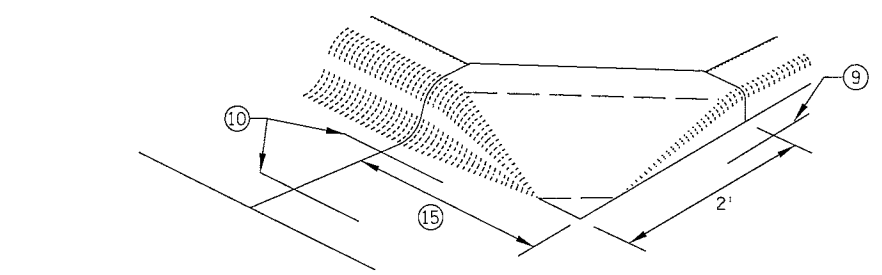


RADIAL DETECTABLE WARNING

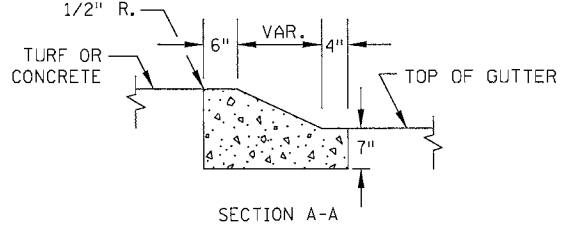


RECTANGULAR DETECTABLE WARNING

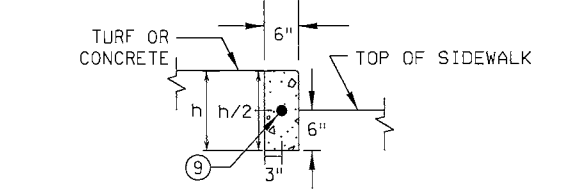
DETECTABLE EDGE WITHOUT CURB AND GUTTER



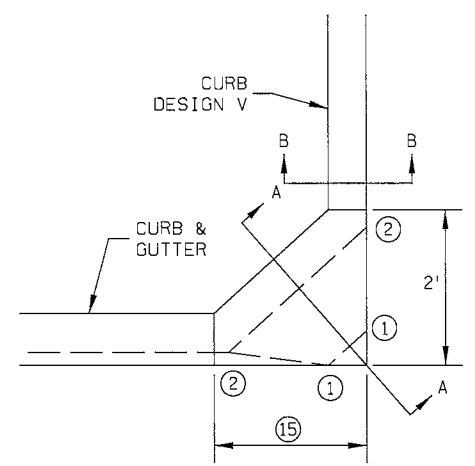
PEDESTRIAN APPROACH NOSE DETAIL (FOR RETURNED CURB SIDE TREATMENT)



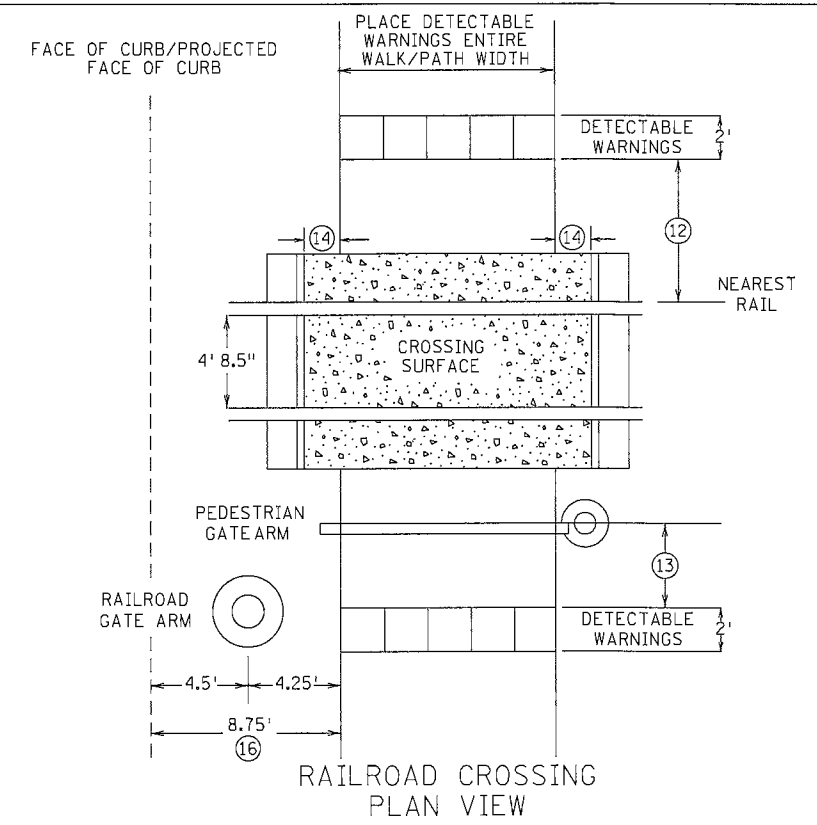
SECTION A-A



SECTION B-B



MINNESOTA DEPARTMENT OF TRANSPORTATION  
STATE DESIGN ENGINEER  
Tom Jahn



RAILROAD CROSSING PLAN VIEW

- NOTES:  
SEE STANDARD PLATE 7038 AND THIS SHEET FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.  
A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.  
CONCRETE FLARE LENGTHS ADJACENT TO NON-WALKABLE SURFACES SHOULD BE LESS THAN 8' LONG MEASURED ALONG THE RAMPS FROM THE BACK OF CURB.
- 1 0" CURB HEIGHT.
  - 2 FULL CURB HEIGHT.
  - 3 2' FOR 4" HIGH CURB AND 3' FOR 6" HIGH CURB.
  - 4 SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.
  - 5 TYPICALLY USED FOR MEDIANS AND ISLANDS.
  - 6 WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY. MAINTAIN 3" MAX. BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.
  - 7 IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF BITUMINOUS ROADWAY AND/OR BITUMINOUS SHARED-USE PATH TO PROVIDE VISUAL CONTRAST.
  - 8 ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.
  - 9 DRILL AND GROUT 1 - NO. 4 12" LONG REINFORCEMENT BAR (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE V CURB.
  - 10 DRILL AND GROUT 2 - NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE CURB AND GUTTER.
  - 11 SIDE TREATMENT EXAMPLES SHOWN ARE WHEN THE INITIAL LANDING IS APPROXIMATELY LEVEL WITH THE FULL HEIGHT CURB (I.E. 6' LONG RAMP FOR 6" HIGH CURB). WHEN THE INITIAL LANDING IS MORE THAN 1" BELOW FULL HEIGHT CURB REFER TO SHEETS 1 & 2 TO MODIFY THE CURB HEIGHT TAPERS AND MAINTAIN POSITIVE BOULEVARD DRAINAGE.
  - 12 NEAREST EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 12' MINIMUM TO 15' MAXIMUM FROM THE NEAREST RAIL. FOR SKEWED RAILWAYS IN NO INSTANCE SHALL THE DETECTABLE WARNING BE CLOSER THAN 12' MEASURED PERPENDICULAR TO THE NEAREST RAIL.
  - 13 WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 2' FROM THE APPROACHING SIDE OF THE GATE ARM. THIS CRITERIA GOVERNS OVER NOTE 12.
  - 14 CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.
  - 15 3' FOR MEDIANS AND SPLITTER ISLANDS. NOSE CAN BE REDUCED TO 2' ON FREE RIGHT ISLANDS.
  - 16 SIDEWALK TO BE PLACED 8.75' MIN. FROM THE FACE OF CURB/PROJECTED FACE OF CURB. THIS ENSURES MIN. CLEARANCE BETWEEN THE SIDEWALK AND GATE ARM COUNTERWEIGHT SUPPORTS.

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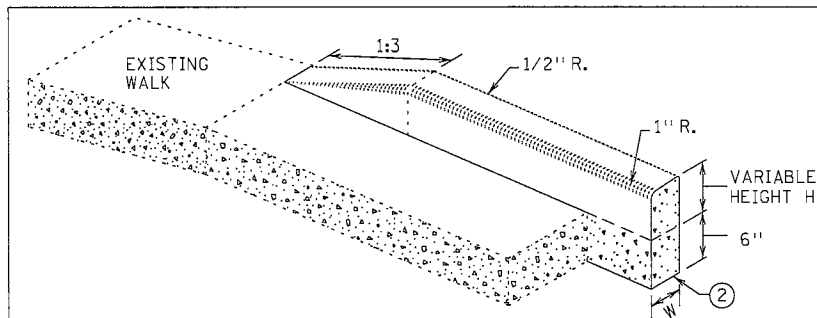
PEDESTRIAN CURB RAMP DETAILS (4 OF 6)

STANDARD PLAN 5-297.250

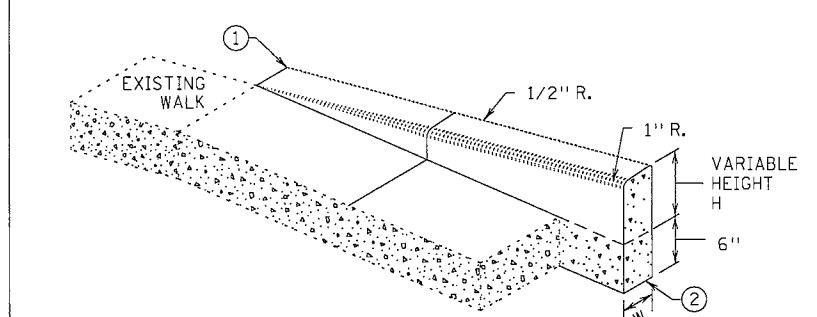
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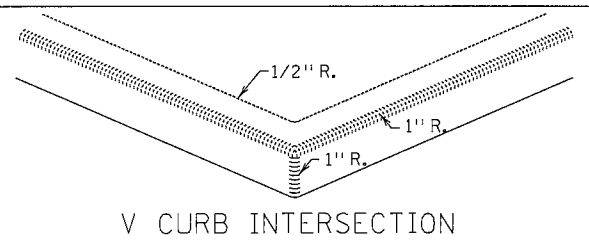
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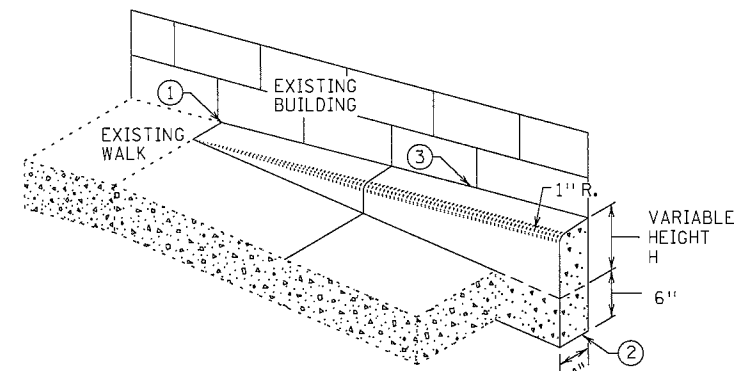
V CURB ADJACENT TO LANDSCAPE  
CURB WITHIN SIDEWALK LIMITS



V CURB ADJACENT TO LANDSCAPE  
CURB OUTSIDE SIDEWALK LIMITS

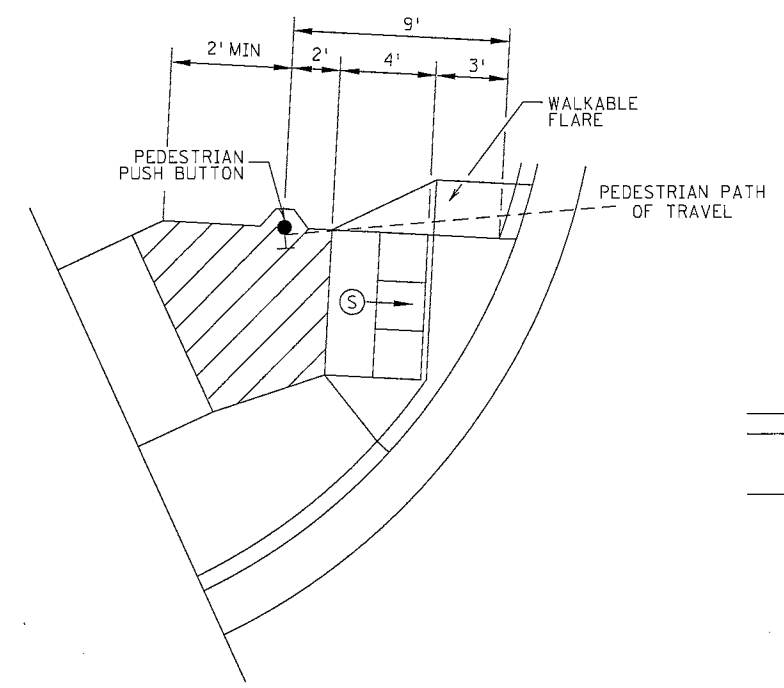


V CURB INTERSECTION

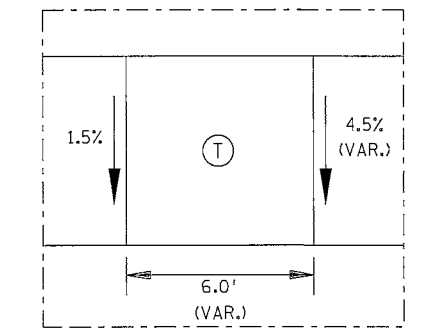
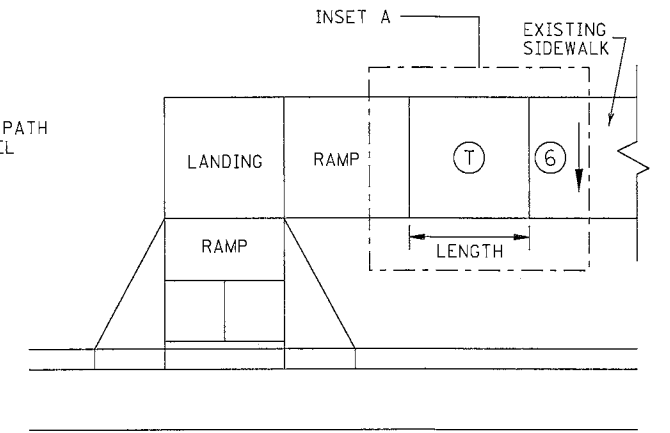


V CURB ADJACENT TO BUILDING  
OR BARRIER

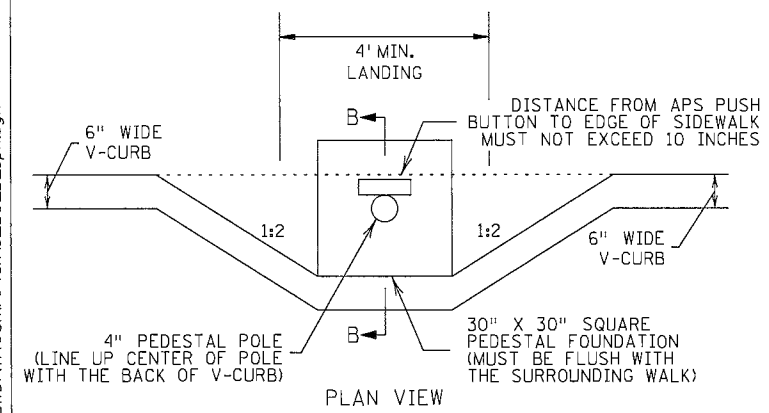
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



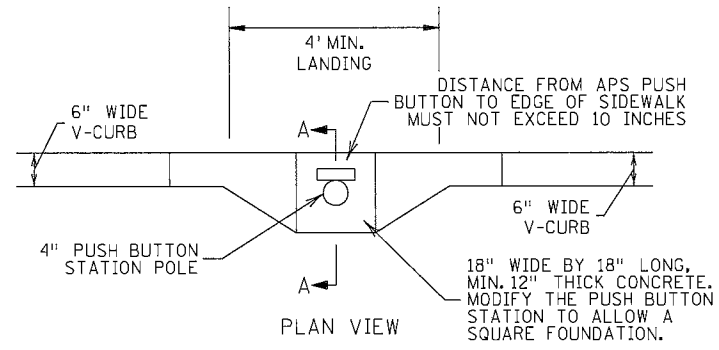
SEMI-DIRECTIONAL RAMP (3,4,9)  
3' DOME SETBACK, 4' LONG RAMP AND  
PUSH BUTTON 9' FROM THE BACK OF CURB  
PRIMARILY USED FOR APS APPLICATIONS  
WHERE THE PAR DOES NOT CONTINUE PAST  
THE PUSH BUTTON (DEAD-END SIDEWALK)



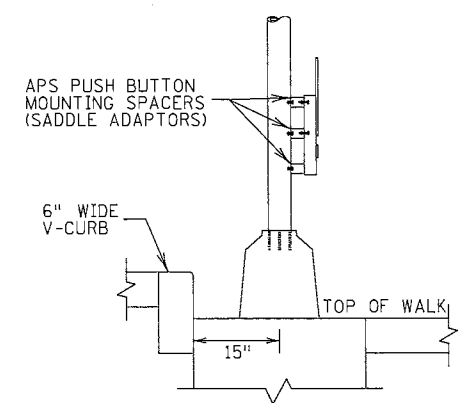
TRANSITION PANEL (4) (5)



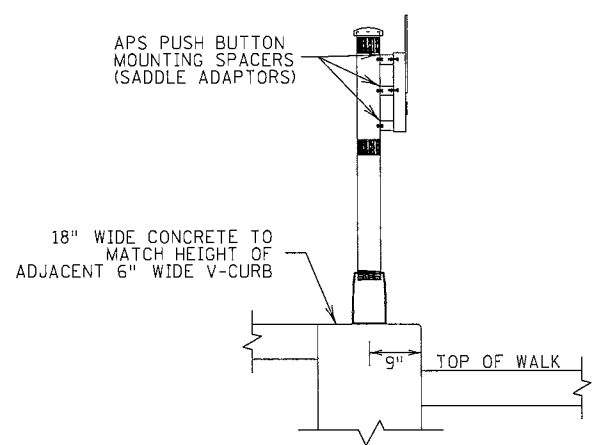
PLAN VIEW



PLAN VIEW



SECTION B-B



SECTION A-A

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)

PUSH BUTTON STATION (V-CURB)

NOTES:

- A WALKABLE FLARE IS AN 8-10% CONCRETE FLARE THAT IS REQUIRED WHEN THE FLARE IS ADJACENT TO A WALKABLE SURFACE, OR WHEN THE PEDESTRIAN PATH OF TRAVEL OF A PUSH BUTTON TRAVERSES THE FLARE.
- ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.
- WHERE RIGHT-OF-WAY ALLOWS, USE OF V CURB SHOULD BE MINIMIZED. GRADING ADJACENT TURF OR SLOPING ADJACENT PAVEMENT IS PREFERRED.
- V CURB SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.
- V CURB NEXT TO BUILDING SHALL BE A 4" WIDTH AND SHALL MATCH PREVIOUS TOP OF SIDEWALK ELEVATIONS.
- ① END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.
- ② ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.
- ③ EDGE BETWEEN NEW V CURB AND INPLACE STRUCTURE SHALL BE SEALED AND BOND BREAKER SHALL BE USED BETWEEN EXISTING STRUCTURE AND PLACED V-CURB.
- ④ THE MAX. RATE OF CROSS SLOPE TRANSITIONING IS 1' LINEAR FOOT OF SIDEWALK PER HALF PERCENT CROSS SLOPE. WHEN PAR WIDTH IS GREATER THAN 6' OR THE RUNNING SLOPE IS GREATER THAN 5%, DOUBLE THE CALCULATED TRANSITION LENGTH.
- ⑤ TRANSITION PANELS ARE TO ONLY BE USED AFTER THE RAMP, OR IF NEEDED, LANDING ARE AT THE FULL CURB HEIGHT (TYPICAL SECTION).
- ⑥ EXISTING CROSS SLOPE GREATER THAN 2.0%.

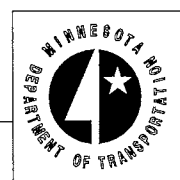
LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

- ⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
- LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.
- ① TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE. RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK. SEE THIS SHEET FOR ADDITIONAL INFORMATION.

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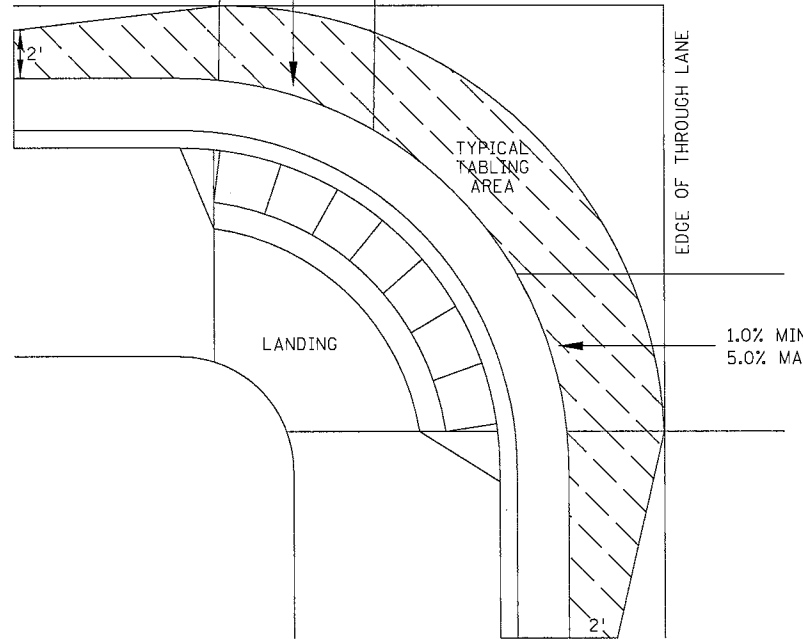
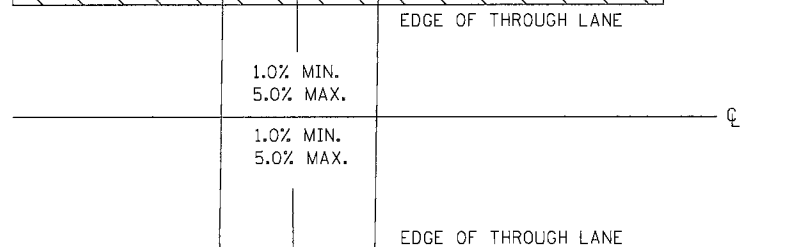
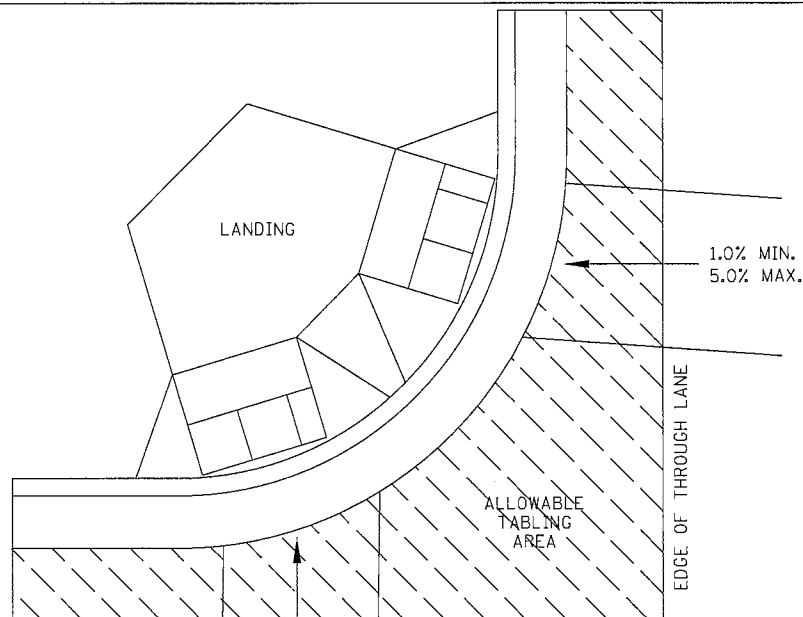
PEDESTRIAN CURB RAMP DETAILS (5 OF 6)

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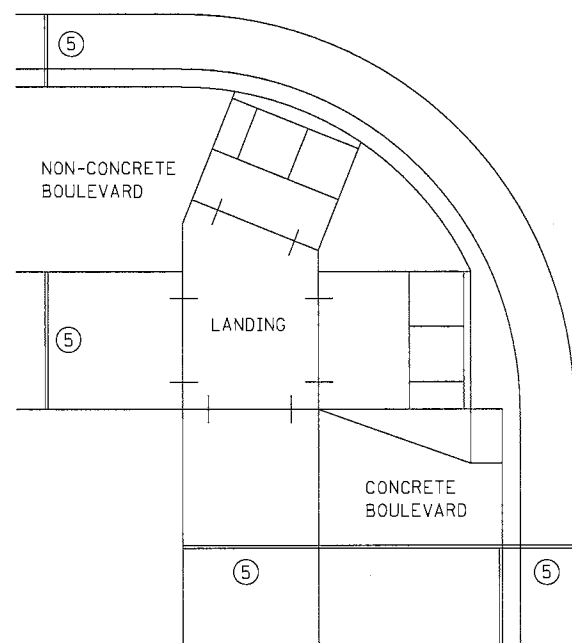
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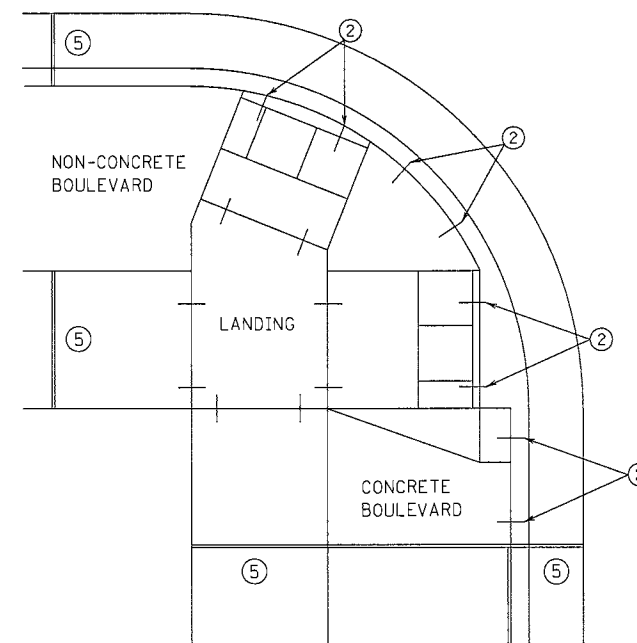
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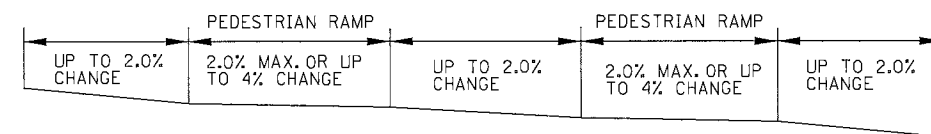
CURB LINE AND ROAD CROSSING ADJUSTMENTS



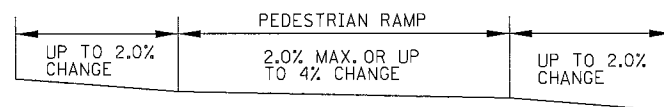
EXPANSION MATERIAL PLACEMENT FOR CONCRETE AND BITUMINOUS ROADWAYS



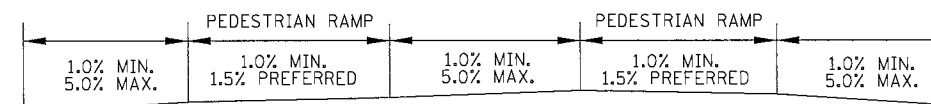
OPTIONAL CURB LINE REINFORCEMENT PLACEMENT ON BITUMINOUS ROADWAYS



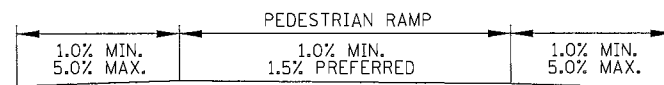
FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS



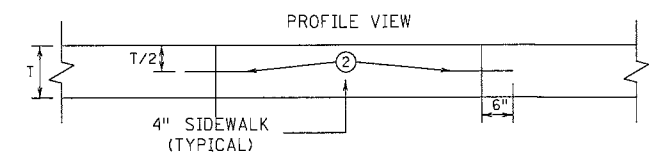
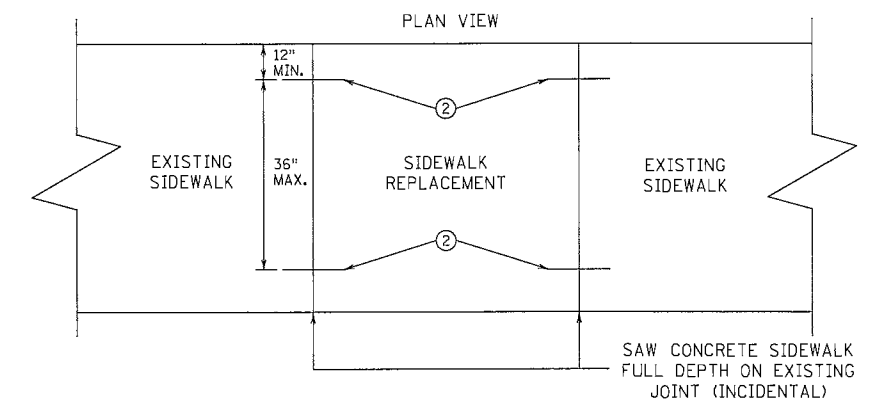
FLOW LINE PROFILE "TABLE" - FAN



FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS

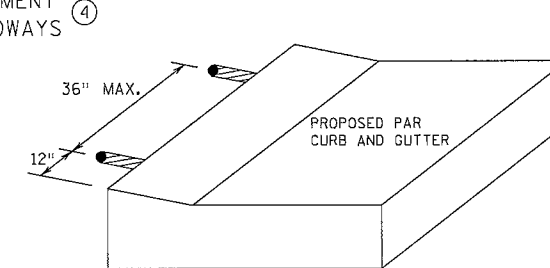


FLOW LINE PROFILE RAISE - FAN

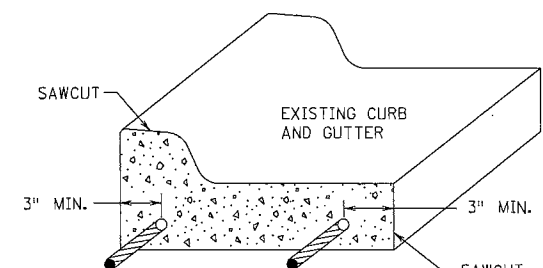


OPTIONAL SIDEWALK REINFORCEMENT

SIDEWALK REINFORCEMENT TO BE USED ONLY WHEN SPECIFIED IN THE PLAN.

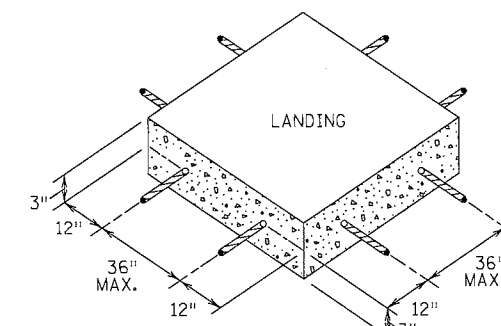


OPTIONAL CURB LINE REINFORCEMENT DETAILS

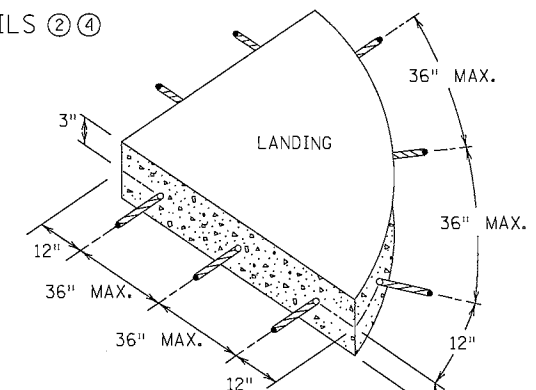


FOR USE ON CURB RAMP RETROFITS

CURB AND GUTTER REINFORCEMENT



SEPARATE LANDING POUR REINFORCEMENT



"TABLING" OF CROSSWALKS MEANS MAINTAINING LESS THAN 2% CROSS SLOPE WITHIN A CROSSWALK, IS REQUIRED WHEN A ROADWAY IS IN A STOP OR YIELD CONDITION AND THE PROJECT SCOPE ALLOWS.

RECONSTRUCTION PROJECTS: ON FULL PAVEMENT REPLACEMENT PROJECTS "TABLING" OF ENTIRE CROSSWALK SHALL OCCUR WHEN FEASIBLE.

MILL & OVERLAY PROJECTS: "TABLING" OF FLOW LINES, IN FRONT OF THE PEDESTRIAN RAMP, IS REQUIRED WHEN THE EXISTING FLOW LINE IS GREATER THAN 2%. WARPING OF THE BITUMINOUS PAVEMENT CAN NOT EXTEND INTO THE THROUGH LANE. TABLE THE FLOW LINE TO 2% OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA:

- 1) 1.0% MIN. CROSS-SLOPE OF THE ROAD
- 2) 5.0% MAX. CROSS-SLOPE OF THE ROAD
- 3) "TABLE" FLOW LINE UP TO 4% CHANGE FROM EXISTING SLOPE IN FRONT OF PEDESTRIAN RAMP
- 4) UP TO 2% CHANGE IN FLOW LINE FROM EXISTING SLOPE BEYOND THE PEDESTRIAN CURB RAMP

STAND-ALONE ADA RETROFITS: FOLLOW MILL & OVERLAY CRITERIA ABOVE HOWEVER ALL PAVEMENT WARPING IS DONE WITH BITUMINOUS PATCHING ON BITUMINOUS ROADWAYS AND FULL-DEPTH APRON REPLACEMENT ON CONCRETE ROADWAYS.

RAISING OF CURB LINES SHOULD OCCUR IN VERTICALLY CONSTRAINED AREAS. RAISE THE CURB LINES ENOUGH TO ALLOW COMPLIANT RAMPS OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA:

- 1) 1.0% MIN. AND 5.0% MAXIMUM CROSS-SLOPE OF THE ROAD
- 2) 1.0% MIN. FLOW LINE (ON EITHER SIDE OF PEDESTRIAN RAMP) TO MAINTAIN POSITIVE DRAINAGE
- 3) 5.0% RECOMMENDED MAX. FLOW LINE
- 4) LONGITUDINAL THROUGH LANE ROADWAY TAPERS SHOULD BE 1" VERTICAL PER 15' HORIZONTAL

NOTES:

- ① TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON THIS SHEET FOR ALL SEPARATELY POURED INITIAL LANDINGS.
- ② DRILL AND GROUT NO. 4 12" LONG REINFORCEMENT BARS AT 36" MAXIMUM CENTER TO CENTER (EPOXY COATED). BARS TO BE ADJUSTED TO MATCH RAMP GRADE.
- ③ DRILL AND GROUT 2 - NO. 4 X 12" LONG REINFORCEMENT BARS (EPOXY COATED). REINFORCEMENT REQUIRED FOR ALL CONSTRUCTION JOINTS WITHIN RADIUS.
- ④ THIS OPTIONAL CURB LINE REINFORCEMENT DETAIL SHOULD ONLY BE USED ON BITUMINOUS ROADWAYS WHEN SPECIFIED IN THE PLAN.
- ⑤ 1/2 IN. PREFORMED JOINT FILLER MATERIAL PER MNDOT SPEC. 3702.

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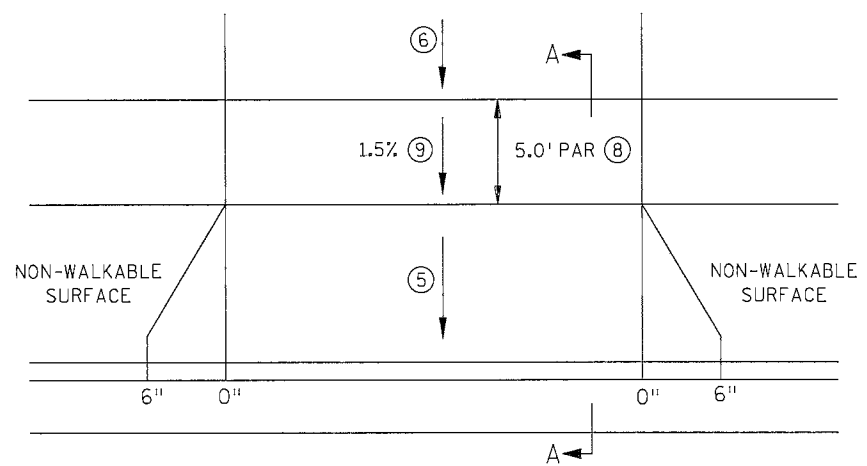
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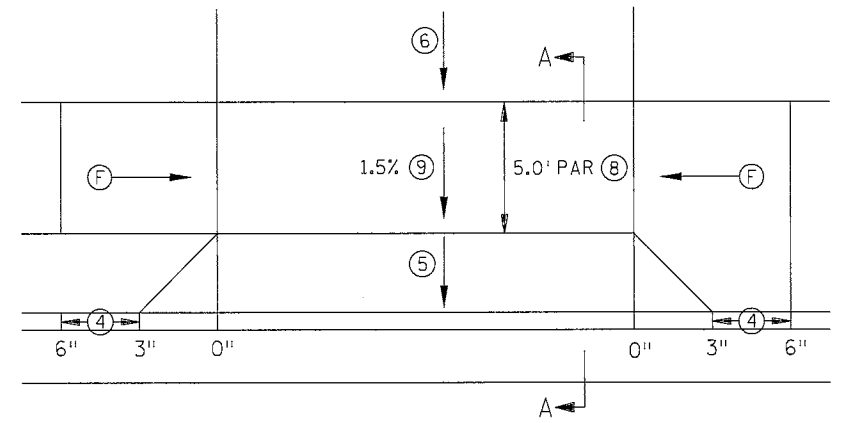
PEDESTRIAN CURB RAMP DETAILS (6 OF 6)

STANDARD PLAN 5-297.250 13 OF 32

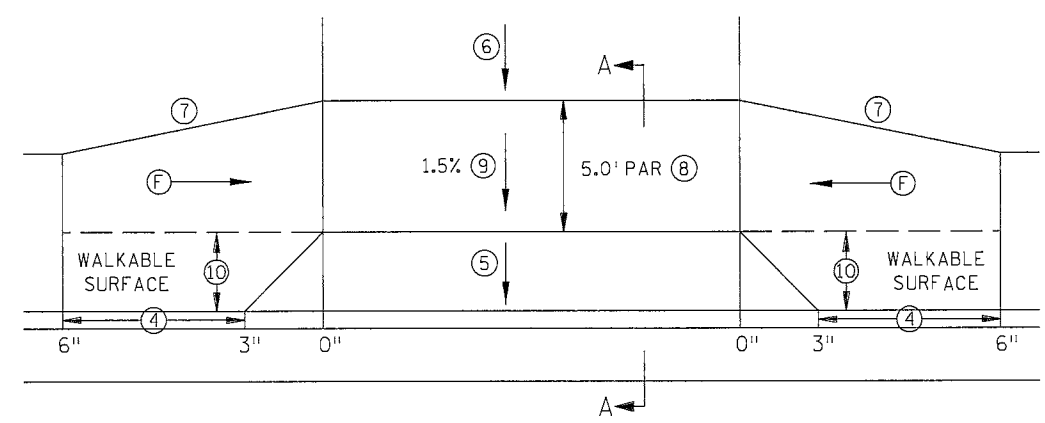
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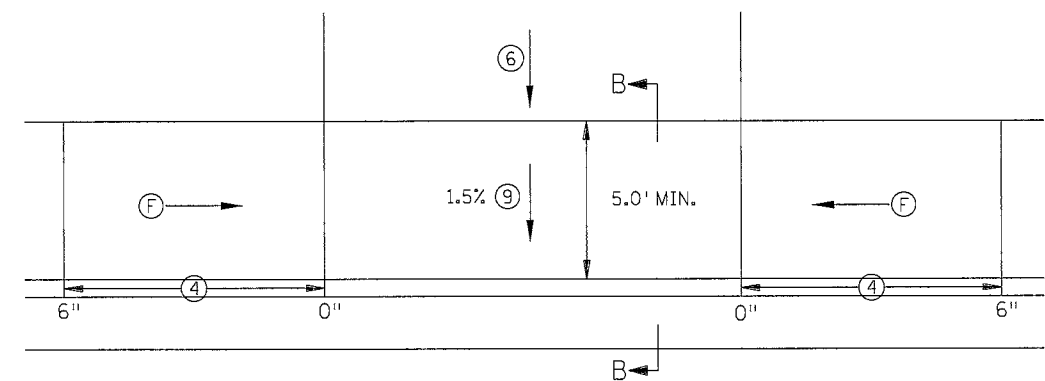
PERPENDICULAR DRIVEWAY ①



TIERED PERPENDICULAR DRIVEWAY ②



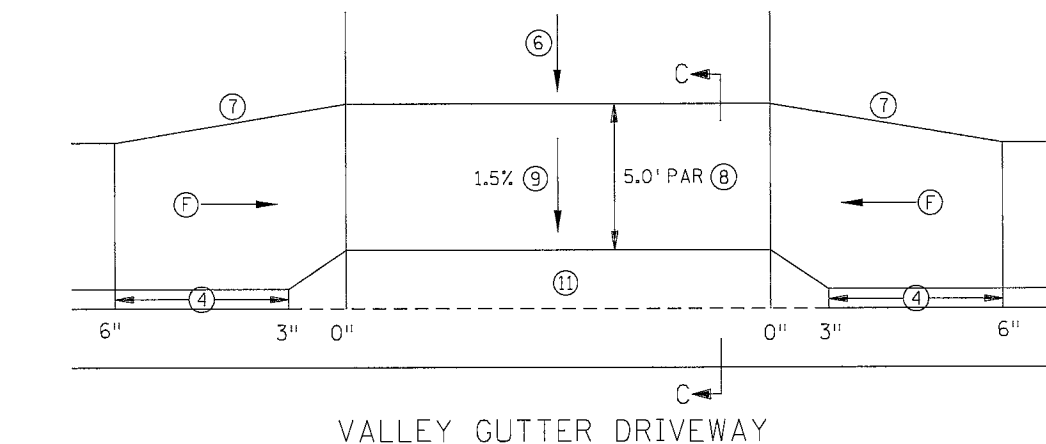
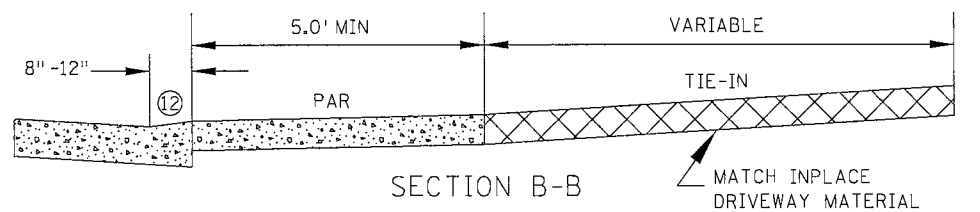
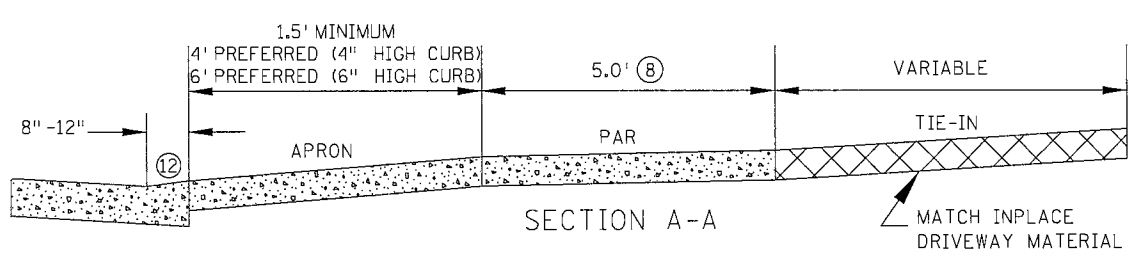
TIERED PERPENDICULAR OFFSET DRIVEWAY



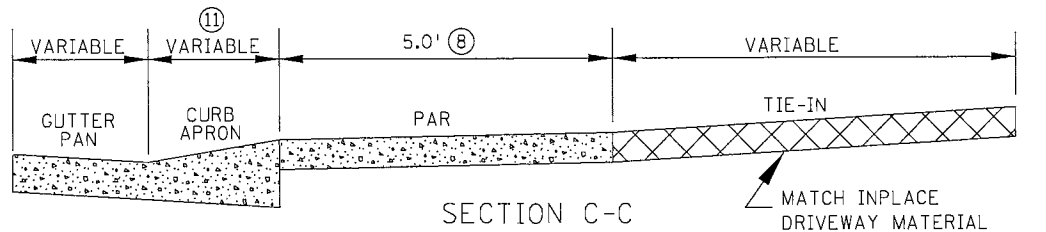
PARALLEL DRIVEWAY ③

NOTES:

- IN NO CASE SHALL SIDEWALK PROFILES EXCEED 5.0%, EXCEPT SIDEWALK PROFILES CAN MATCH ROADWAY GRADE IF ROADWAY GRADE IS GREATER THAN 5.0%. RAMPS FOR DRIVEWAYS ARE REQUIRED TO FOLLOW THE ABOVE SIDEWALK CRITERIA.
- CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PEDESTRIAN ACCESS ROUTE (PAR). 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.
- DRIVEWAY TYPES FROM MOST PREFERRED TO LEAST PREFERRED ARE AS FOLLOWS: PERPENDICULAR, TIERED PERPENDICULAR, TIERED PERPENDICULAR OFFSET & PARALLEL.
- ① TO BE USED WHEN THE DRIVEWAY PAR IS LEVEL WITH OR ABOVE THE TOP OF CURB, RESULTING IN A CONTINUOUS PAR PROFILE.
- ② TO BE USED WHEN THE DRIVEWAY PAR IS BELOW THE ROADWAY CURB HEIGHT. THIS DRIVEWAY TYPE CAN BE USED FOR BOTH PAVED (AS SHOWN) AND GRASS BOULEVARDS.
- ③ SHOULD BE USED FOR NEGATIVE SLOPED DRIVEWAYS. DW CURB TYPE 2 CURB SHOULD BE USED TO RAISE PAR ABOVE GUTTER AND REDUCE "ROLLER COASTER" EFFECT. 4" HIGH ROADWAY CURB SHOULD BE USED TO REDUCE "ROLLER COASTER" EFFECT ESPECIALLY WHEN MULTIPLE DRIVEWAYS ARE PRESENT.
- ④ TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.
- ⑤ 8% MAX. PREFERRED, 10% MAX. FOR COMMERCIAL AND 12% MAX. FOR RESIDENTIAL. SEE GENERAL NOTES ON SHEET 2 FOR MORE INFORMATION.
- ⑥ 8% MAX. PREFERRED, SEE SHEET 2 FOR MORE INFORMATION.
- ⑦ 1:3 MIN. 1:5 PREFERRED FOR DRIVEWAY RETROFIT PROJECTS. 1:10 PREFERRED FOR SIDEWALK REPLACEMENT PROJECTS.
- ⑧ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.
- ⑨ THE PEDESTRIAN ACCESS ROUTE, MAY NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.
- ⑩ SIDEWALK OFFSET TO BE LESS THAN OR EQUAL TO HALF THE APPROACHING SIDEWALK WIDTH.
- ⑪ VALLEY GUTTER APRON TO BE POURED INTEGRAL WITH THE CURB AND GUTTER. SEE SHEET 2 FOR MORE INFORMATION.
- ⑫ SEE SHEET 2 FOR CURB TYPE INFORMATION.



VALLEY GUTTER DRIVEWAY



LEGEND	
(F)	INDICATES DRIVEWAY RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
X"	CURB HEIGHT (INCHES)

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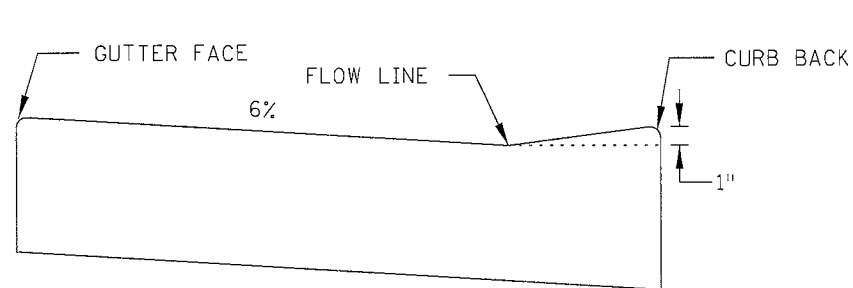
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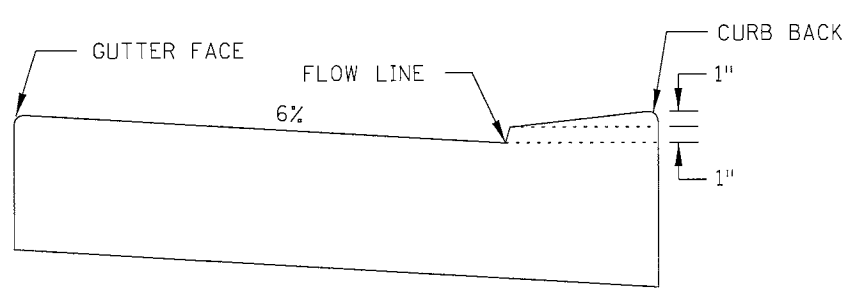
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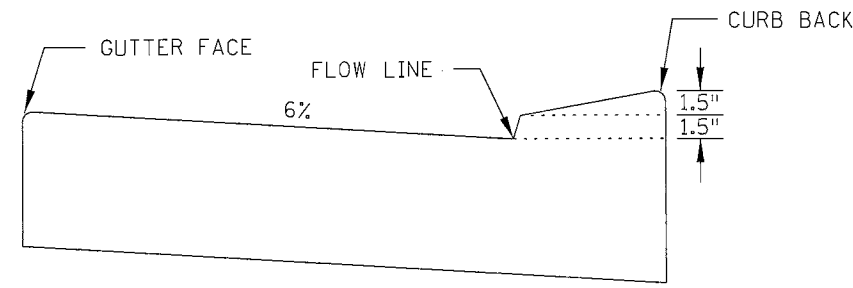
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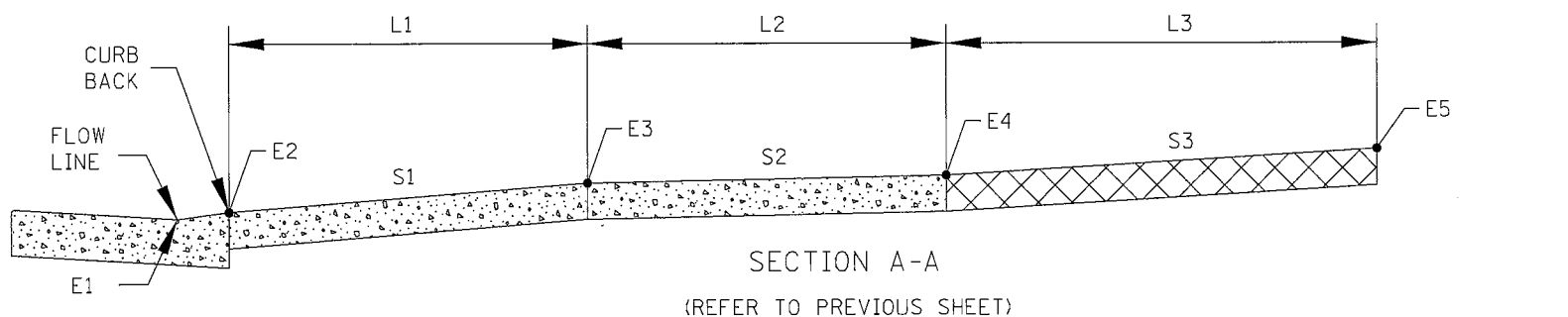
DW CURB STANDARD  
STANDARD CURB AT DRIVEWAY



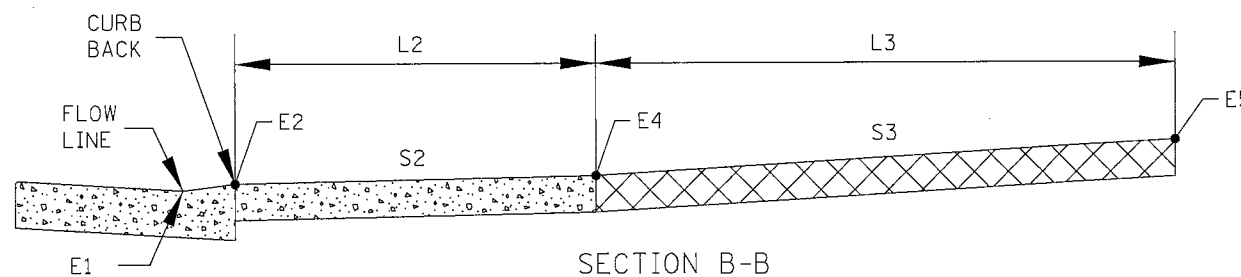
DW CURB TYPE 2  
VERTICALLY CONSTRAINED



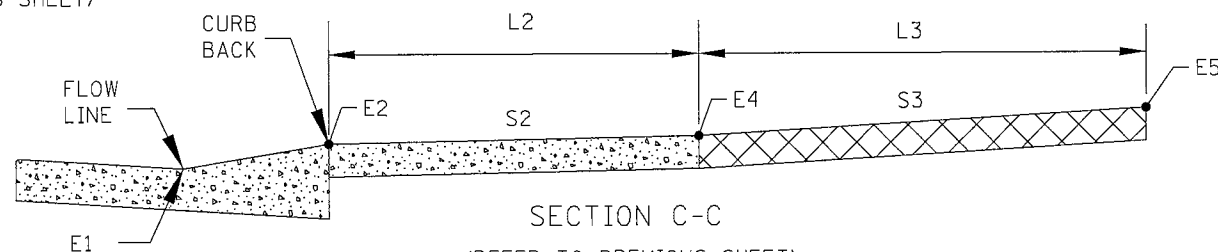
DW CURB TYPE 3  
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SECTION A-A  
(REFER TO PREVIOUS SHEET)



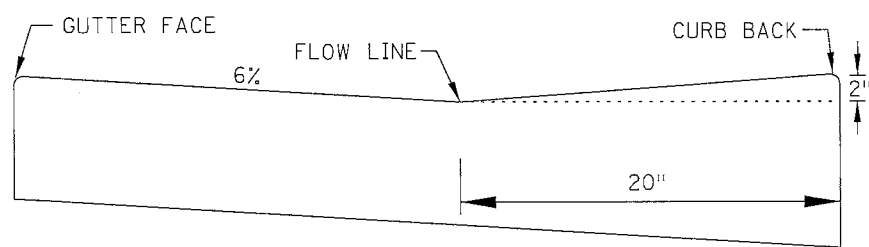
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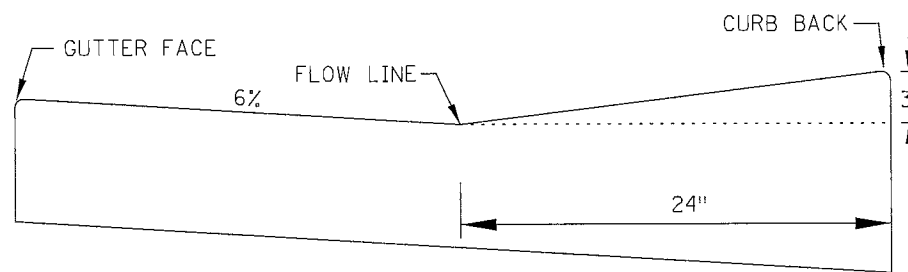
SECTION C-C  
(REFER TO PREVIOUS SHEET)

DRIVEWAY TABULATION ①

STATION	SIDE	DRIVEWAY TYPE	CURB TYPE ③	E1	E2	L1	S1	E3	L2	S2 ②	E4	L3	S3	EXISTING	E5	COMMENTS
						FT	%		FT	%		FT	%	%		



VG 220



VG 324

VALLEY GUTTER CURB  
OTHER CURB HEIGHTS & CURB APRON LENGTHS CAN BE USED

NOTES:

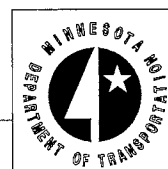
- DW CURB STANDARD SHALL BE USED WHEN THE DRIVEWAY ACTS AS A PEDESTRIAN RAMP. THE MAX. APRON SLOPE MUST ADHERE TO ADA CRITERIA AS WELL. DW CURB STANDARD SHOULD BE USED IF THERE IS ON STREET PARKING.
- WHERE ROADWAY DRAINAGE IS A CONCERN (NEGATIVE SLOPED APRON) DW CURB TYPE 2 CAN BE USED TO HELP KEEP THE WATER ON PUBLIC RIGHT OF WAY.
- S1 8% MAX PREFERRED, 10% MAX. COMMERCIAL AND 12% MAX. RESIDENTIAL. IF EXISTING GRADES ARE STEEPER DO NOT MAKE GRADES APPRECIABLY WORSE BY USING BEST PRACTICES SUCH AS DRIVEWAY CURB HEIGHTS, EXTENDING L3 AND/ OR STEEPEN S3.
- DW CURB TYPE 3 SHALL ONLY BE USED IN EXTREME TIE-IN CASES.
- S3 8% MAX PREFERRED, IF THIS SLOPE IS EXCEEDED OR IS CONTINUED FOR MORE THAN 5' ANALYZE THE NEED FOR VERTICAL CURVE(S). SEE ROAD DESIGN MANUAL, CHAPTER 5, FOR GEOMETRIC DESIGNS OF DRIVEWAYS.
- ① EXAMPLE SHOWN TO BE INCLUDED IN PLAN FOR EACH DRIVEWAY.
- ② SHOULD BE DESIGNED AT 1.5%.
- ③ DW CURB STANDARD SHALL BE THE STARTING POINT FOR ALL PERPENDICULAR AND TIERED DRIVEWAYS. DW CURB TYPES 2 AND 3 SHALL ONLY BE USED AFTER UTILIZING BEST PRACTICES SUCH AS MAXIMIZING S1, S3, AND L3.

DISTRICT #: USER NAME: dffrey PATH & FILENAME: P:\15-01-00CSAH\_5\197th-106th\Plan\254\_2\_sprndgn

FILE NAME: s254\_2\_sprndgn

REVISION:  
APPROVED: JANUARY 23, 2017  
*[Signature]*  
OPERATIONS ENGINEER

SAP 002-651-008



*[Signature]*  
STATE DESIGN ENGINEER

REVISED:  
APPROVED:  
1-23-2017

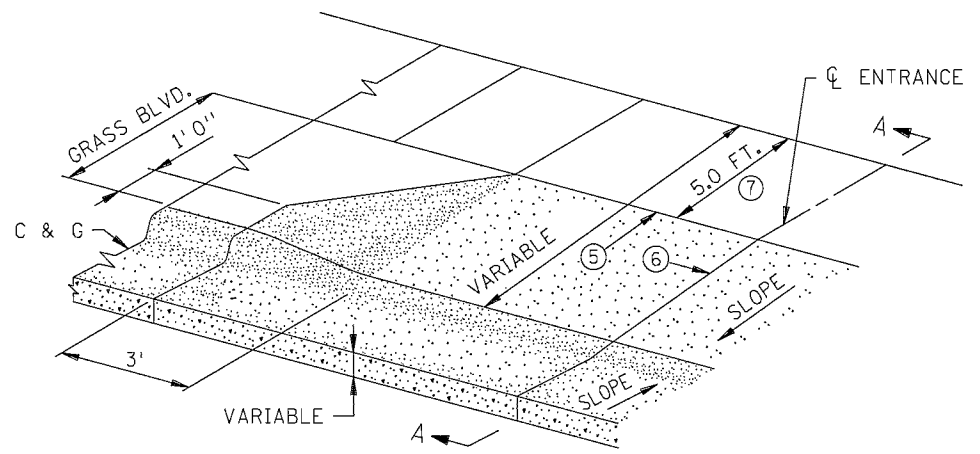
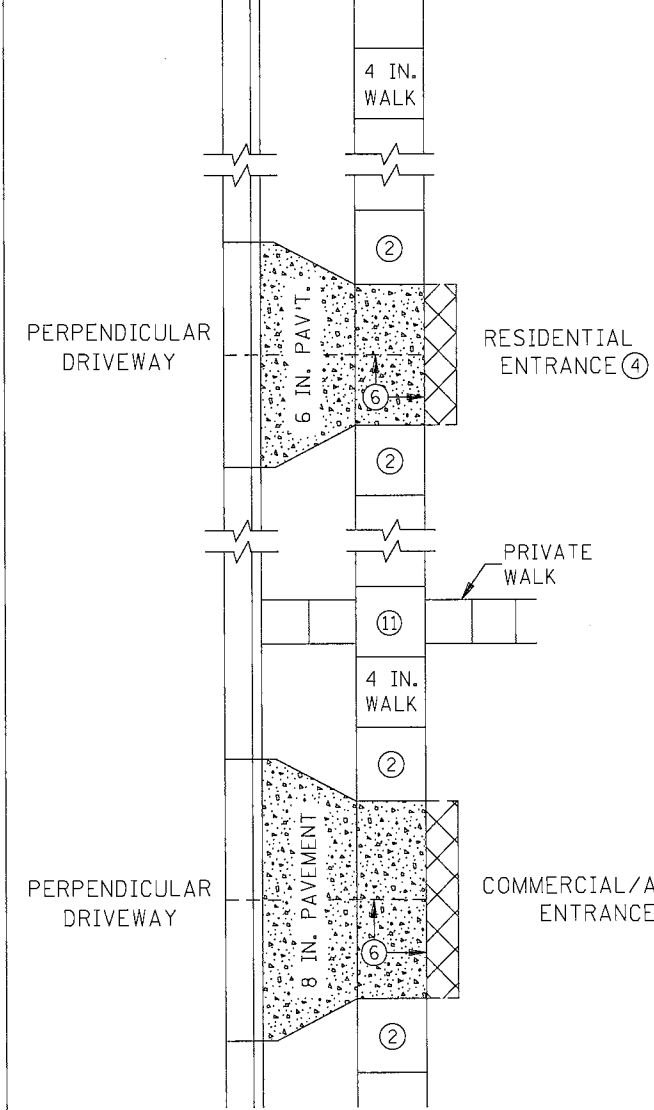
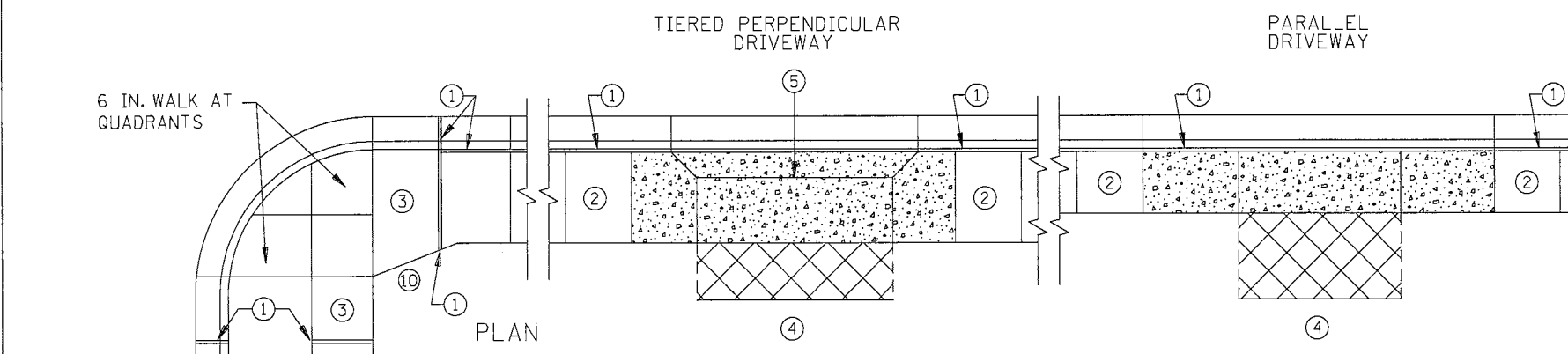
DRIVEWAY AND SIDEWALK DETAILS (2 OF 4)

STANDARD PLAN 5-297.254 15 OF 32

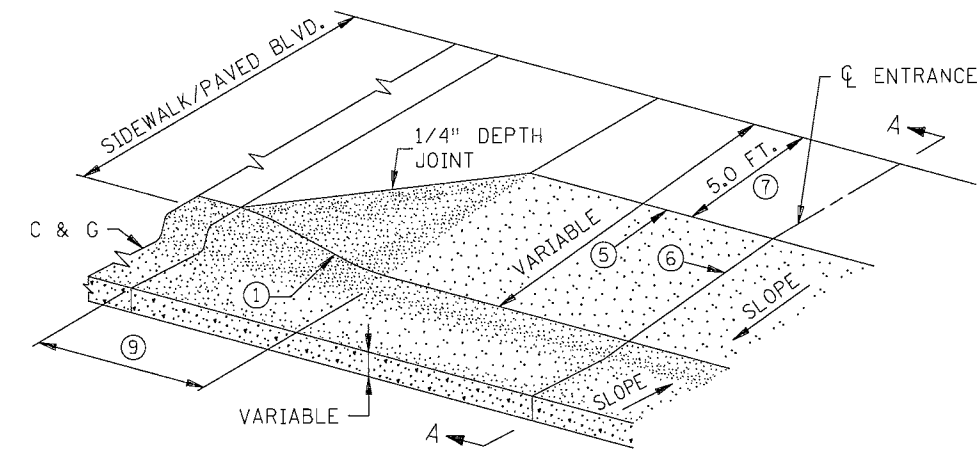
PLOTTED/REVISED:  
03/30/2017

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PATH & FILENAME: P:\N5-01-00\CSAH\_5\197th\06th\Plan\S254\_3\_sprndgn

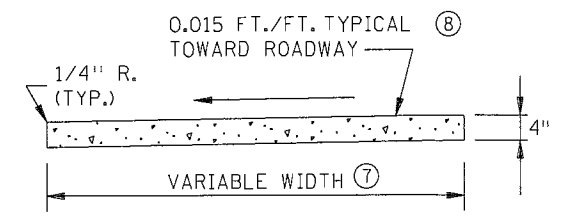
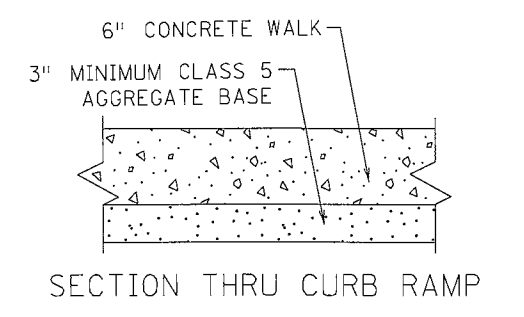
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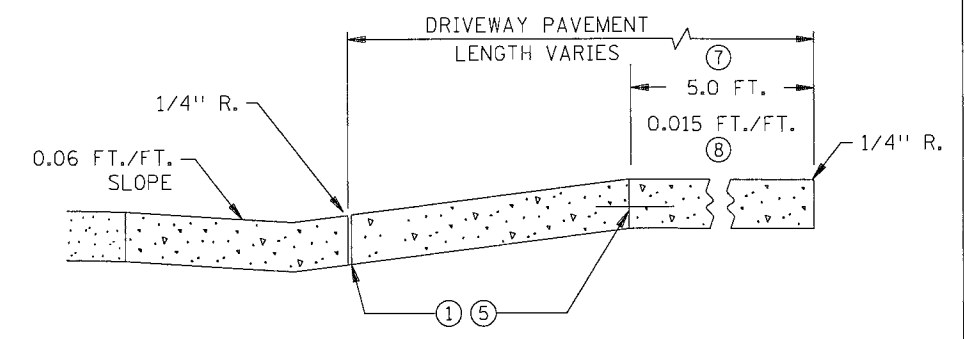
HALF PLAN PERSPECTIVE  
PERPENDICULAR DRIVEWAYS WITH GRASS BOULEVARDS



HALF PLAN PERSPECTIVE  
PERPENDICULAR DRIVEWAYS WITH CONCRETE BOULEVARDS AND ALL TIERED DRIVEWAYS



SECTION THRU WALK



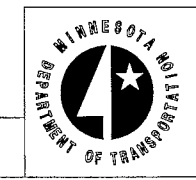
SECTION A-A  
SECTION THRU DRIVEWAY

NOTES:

- TO MINIMIZE SIDEWALK "ROLLER COASTER" EFFECT IT IS DESIRABLE TO KEEP THE PAR ELEVATION CONTINUOUS OR AT LEAST IN THE UPPER HALF OF CURB HEIGHT. 4" HIGH CURB SHOULD BE USED INSTEAD OF 6" HIGH CURB TO HELP THIS PROBLEM WHEN APPLICABLE.
- 4" HIGH ADJACENT CURB IS PREFERRED WHEN BOULEVARDS 4' OR LESS ARE PRESENT MEASURED FROM THE BACK OF CURB. WHEN THE DRIVEWAY IS SLOPING DOWN FROM THE ROADWAY (NEGATIVE) 4" HIGH ADJACENT CURB SHOULD ALSO BE USED.
- SEE ROAD DESIGN MANUAL, CHAPTER 5, FOR GEOMETRIC DESIGN OF DRIVEWAYS.
- ① 1/2 IN. PREFORMED JOINT FILLER MATERIAL PER MnDOT SPEC. 3702, EXCEPT AT GRASS BOULEVARDS.
- ② TRANSITION DRIVEWAY THICKNESS TO WALK THICKNESS.
- ③ TRANSITION CURB RAMP THICKNESS TO WALK THICKNESS.
- ④ MATCH INPLACE DRIVEWAY WIDTH, MATERIAL TYPE AND THICKNESS.
- ⑤ TIE ONLY IF ADJACENT SECTIONS ARE NOT POURED MONOLITHICALLY. SEE SECTION A-A.
- ⑥ FORM CONTRACTION JOINT AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANELS (MAXIMUM WIDTH 15 FT. BETWEEN JOINTS).
- ⑦ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.
- ⑧ THE PEDESTRIAN ACCESS ROUTE CROSS-SLOPE, SHALL NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.
- ⑨ 8% TO 10% FLARES SHALL BE USED WHEN ADJACENT TO WALKABLE SURFACES AND FOR ALL TIERED DRIVEWAYS WITH GRASS BOULEVARDS.
- ⑩ 1:10 MIN. SIDEWALK OFFSET TAPER REQUIRED FOR SIDEWALK REPLACEMENT PROJECTS. 1:3 MIN. AND 1:5 MIN. PREFERRED SIDEWALK OFFSET TAPER FOR DRIVEWAY REPLACEMENT.
- ⑪ LANDING REQUIRED, SEE NEXT SHEET FOR MORE INFORMATION.

REVISION:  
APPROVED: JANUARY 23, 2017  
OPERATIONS ENGINEER

SAP 002-651-008



Tom [Signature]  
STATE DESIGN ENGINEER

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APPROVED:  
1-23-2017

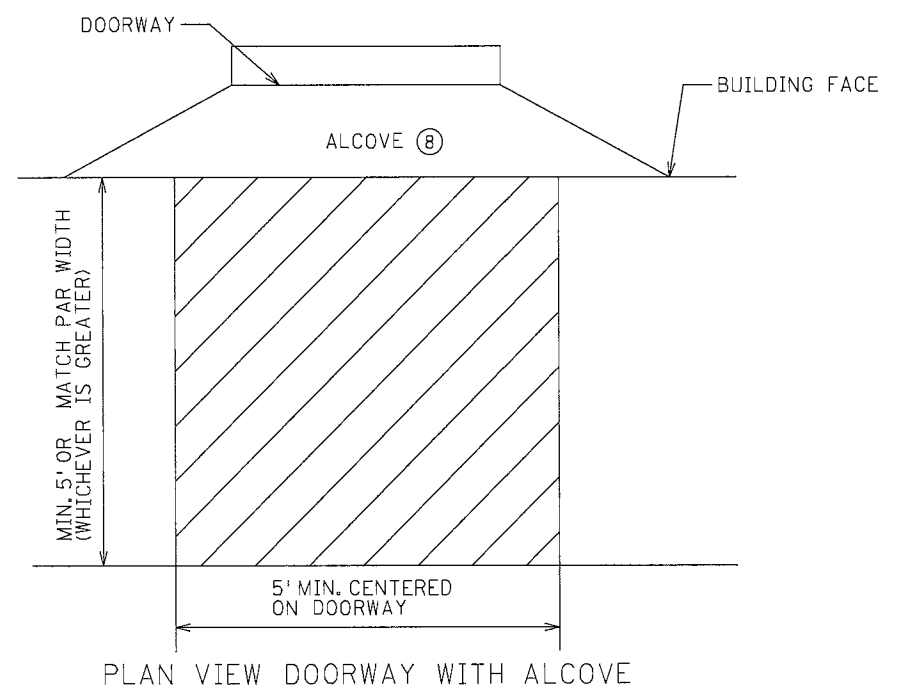
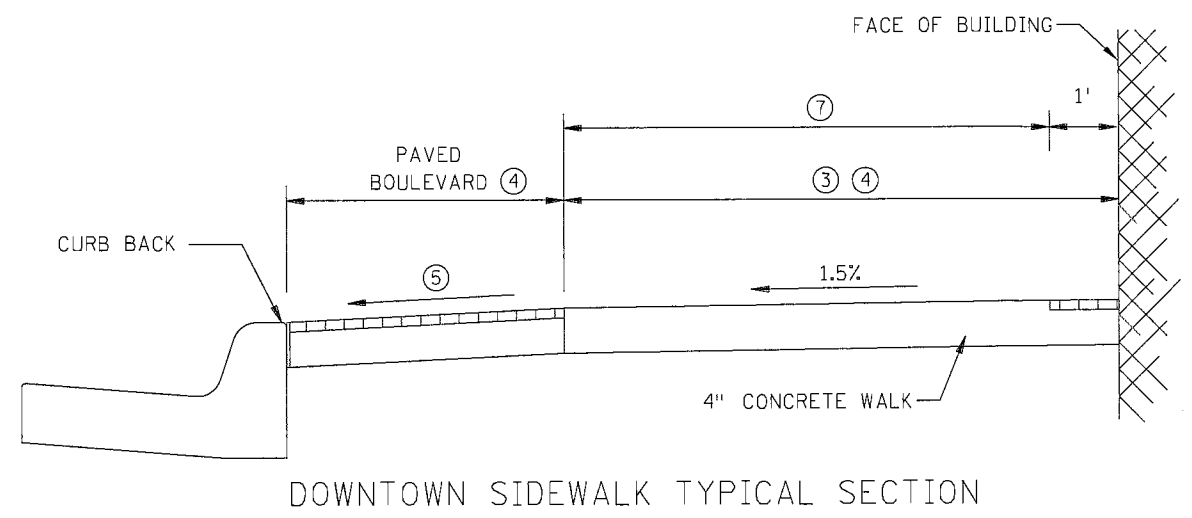
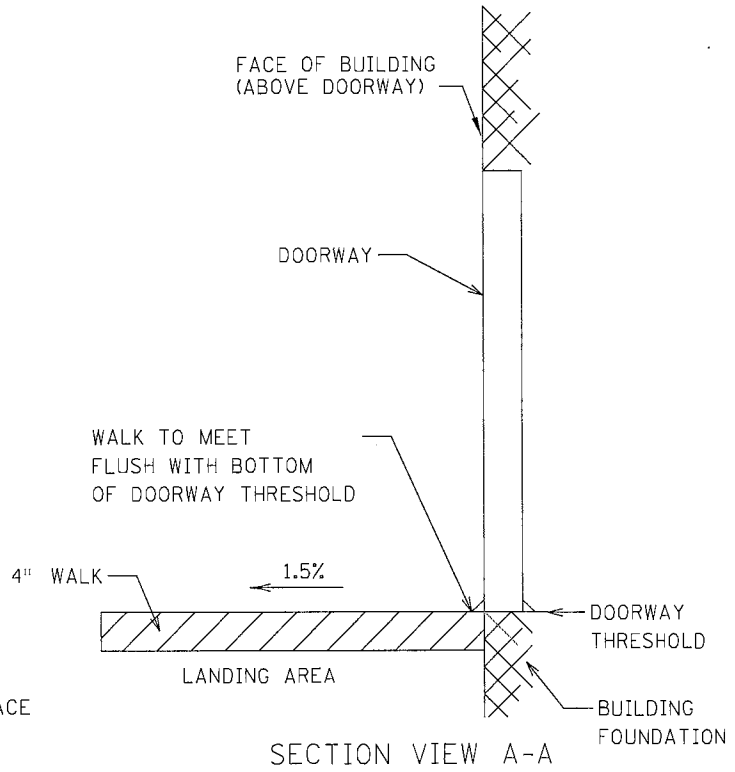
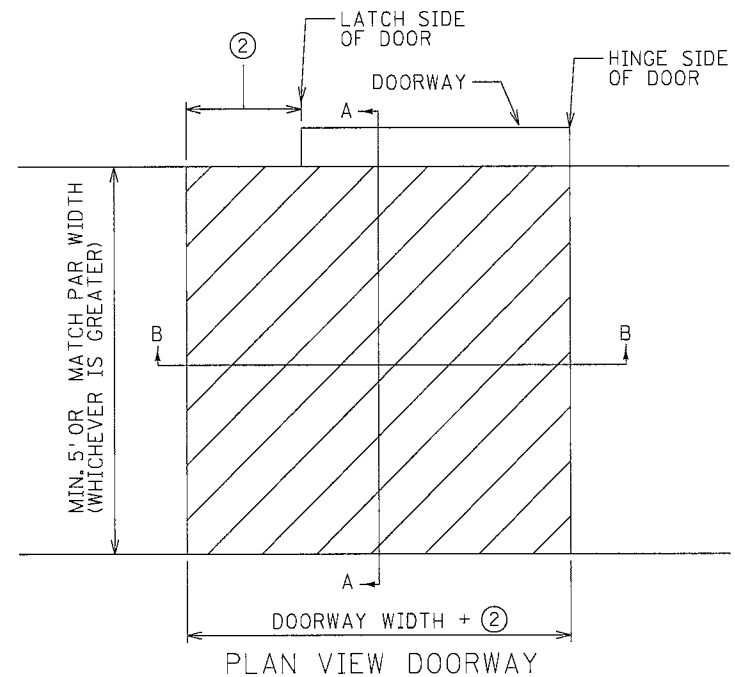
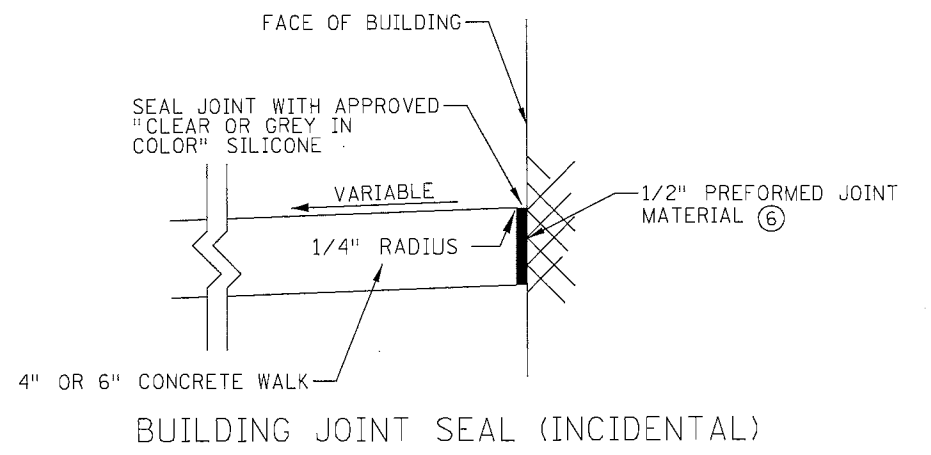
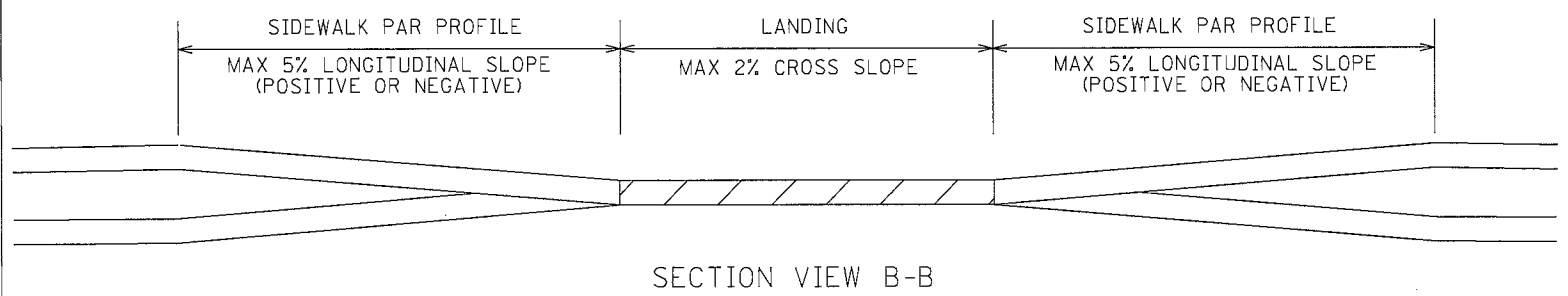
DRIVEWAY AND SIDEWALK DETAILS (3 OF 4)  
STANDARD PLAN 5-297.254 16 OF 32



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03/30/2017

DISTRICT #:  
USER NAME: dffrey  
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FILE NAME:  
s254\_4\_spr.dgn



- NOTES:
- FIELD ADJUST SIDEWALK PROFILES TO MEET ALL DOORWAY THRESHOLDS.
  - SIDEWALK MUST MAINTAIN POSITIVE DRAINAGE AWAY FROM THE BUILDING TO THE ROADWAY. SEE SPECIAL PROVISIONS FOR SILICONE SPECIFICATIONS.
  - (1) LANDING CRITERIA IS REQUIRED FOR ALL DOORS, PRIVATE WALKS AND STEPS.
  - (2) 18" MIN. WHEN DOOR SWINGS OUTWARD FROM BUILDING.  
12" MIN. WHEN DOOR SWINGS INWARD FROM BUILDING.
  - (3) 6' MIN. PAR REQUIRED WHEN ADJACENT TO BUILDINGS.
  - (4) 2/3 PAR TO 1/3 BOULEVARD SHOULD BE USED WHEN FEASIBLE.
  - (5) 1%-5% FOR THE MAJORITY OF THE BLOCK, WITH EXCEPTIONS UP TO 8% IN CONSTRAINED AREAS. 10% MAX. FOR SHORT SECTIONS TO ACCOUNT FOR FIELD TOLERANCES.
  - (6) FURNISH AND INSTALL BACKER ROD OF APPROPRIATE DIAMETER.
  - (7) TO MINIMIZE VIBRATION AND ROLLING RESISTANCE, AREA SHOULD BE FREE OF PAVERS, STAMPED CONCRETE, AND/OR EXCESSIVE JOINTING.
  - (8) 2% MAX. PER BUILDING CODE. IF GREATER THAN 2%, FLATTEN AS FEASIBLE.

LEGEND	
	LANDING - ALL SLOPES TO BE LESS THAN 2%
	OPTIONAL AESTHETIC TREATMENT

REVISION:
APPROVED: JANUARY 23, 2017
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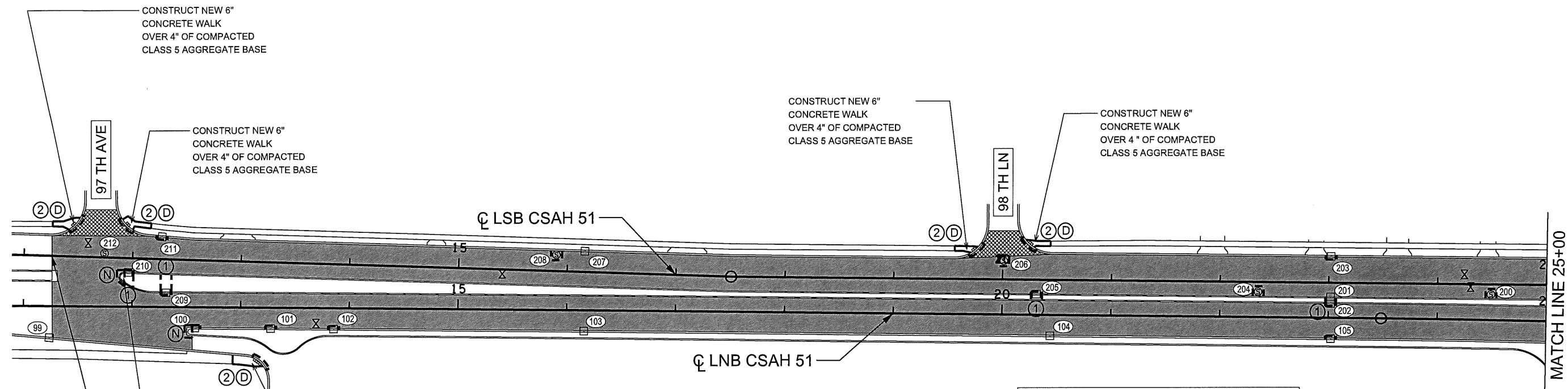
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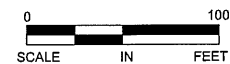
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APPROVED:  
1-23-2017

DRIVEWAY AND SIDEWALK DETAILS (4 OF 4)  
STANDARD PLAN 5-297.254 17 OF 32



LEGEND	
(H)	ADJUST HANDHOLE
(N)	REMOVE AND REPLACE CONCRETE MEDIAN NOSE
(D)	TRUNCATED DOMES
(1)	4" CONCRETE WALK (REMOVE AND REPLACE)
(2)	6" CONCRETE WALK (REMOVE AND REPLACE)
(3)	ADJUST HANDHOLE
[L]	APRX. LOOP LOCATION
X	ADJUST GATE VALVE
---	SAWCUT / CURB REPLACEMENT
[Solid Grey]	MAINLINE MILL AREA
[Hatched]	STREET APPROACH MILL AREA



NO	DATE	BY	CKD	APPR	REVISION	DATES	TIMES

NAME: \$DGN\$

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

PRINT NAME: MATTHEW J. JOHN

SIGNATURE: *Matthew J. John*

DATE: 3/8/2017 LICENSE NO. 51639

DRAWN BY: KPR DATE: 01/20/2017

DESIGN BY: KPR DATE: 01/20/2017

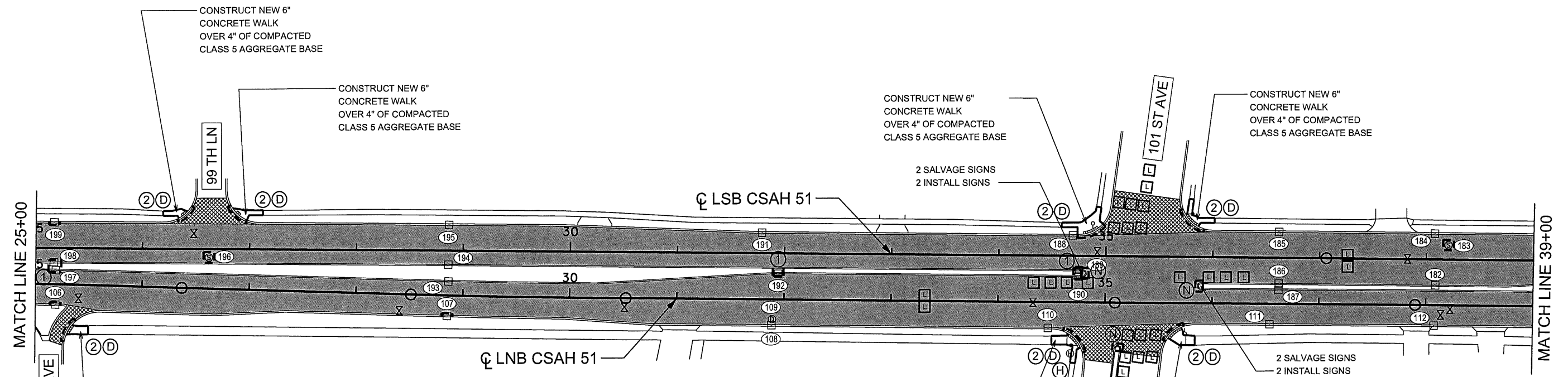
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**ANOKA COUNTY**  
**HIGHWAY DEPT.**

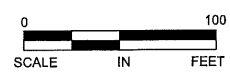
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CONSTRUCTION PLAN  
STA 11+25 TO 25+00  
Sheet 18 of 32 Sheets

USERS



LEGEND	
(H)	ADJUST HANDHOLE
(N)	REMOVE AND REPLACE CONCRETE MEDIAN NOSE
(D)	TRUNCATED DOMES
(1)	4" CONCRETE WALK (REMOVE AND REPLACE)
(2)	6" CONCRETE WALK (REMOVE AND REPLACE)
(3)	ADJUST HANDHOLE
[L]	APRX. LOOP LOCATION
⊗	ADJUST GATE VALVE
---	SAWCUT / CURB REPLACEMENT
[Solid Grey]	MAINLINE MILL AREA
[Hatched]	STREET APPROACH MILL AREA



NO	DATE	BY	CKD	APPR	REVISION	\$DATE\$	\$TIME\$

NAME: SDGNS

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PRINT NAME: MATTHEW J. JOHN

SIGNATURE: *[Signature]*

DATE: 3/8/2017 LICENSE NO. 51639

DRAWN BY: KPR DATE: 01/20/2017

DESIGN BY: KPR DATE: 01/20/2017

CHECKED BY: KPR DATE: 02/03/2017

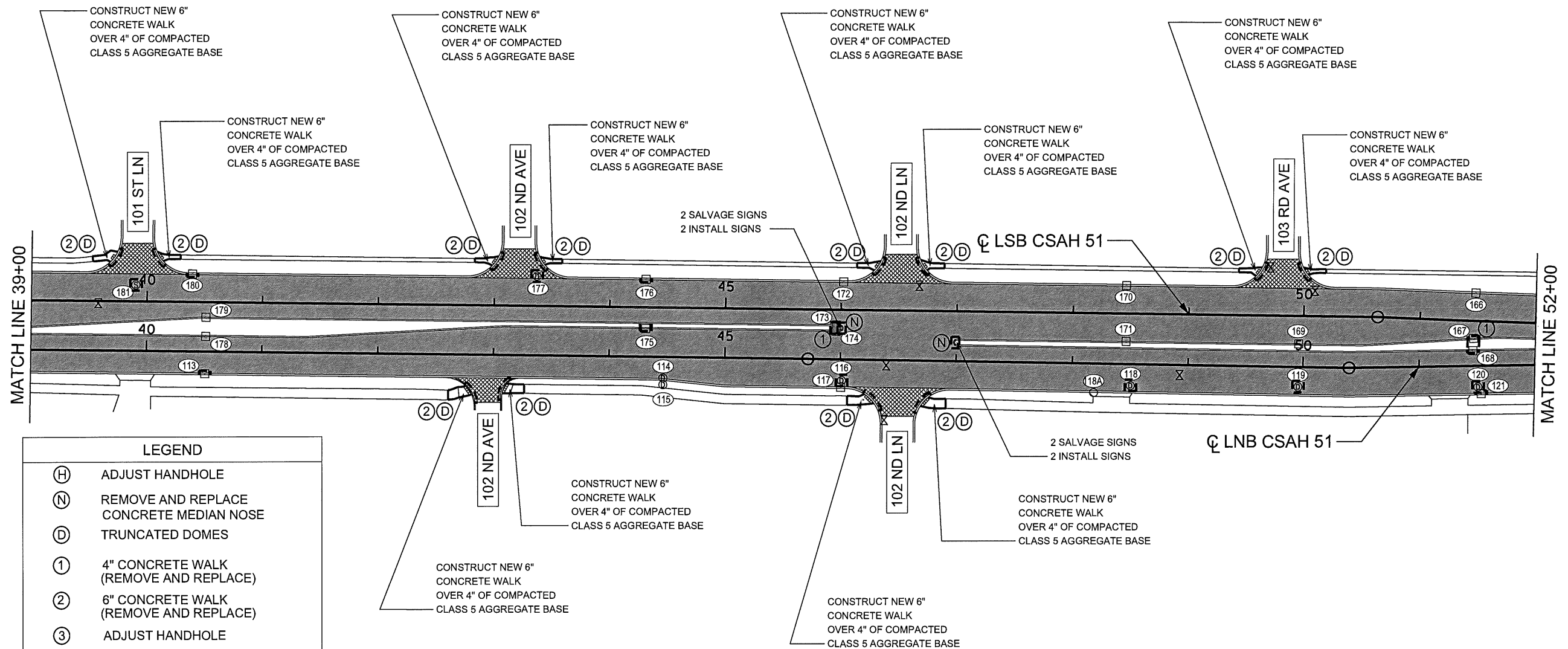
**ANOKA COUNTY**  
**HIGHWAY DEPT.**

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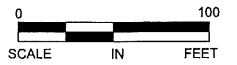
CONSTRUCTION PLAN

STA 25+00 TO 39+00

Sheet 19 of 32 Sheets



LEGEND	
(H)	ADJUST HANDHOLE
(N)	REMOVE AND REPLACE CONCRETE MEDIAN NOSE
(D)	TRUNCATED DOMES
(1)	4" CONCRETE WALK (REMOVE AND REPLACE)
(2)	6" CONCRETE WALK (REMOVE AND REPLACE)
(3)	ADJUST HANDHOLE
[ ]	APRX. LOOP LOCATION
X	ADJUST GATE VALVE
---	SAWCUT / CURB REPLACEMENT
[ ]	MAINLINE MILL AREA
[ ]	STREET APPROACH MILL AREA



NO	DATE	BY	CKD	APPR	REVISION	\$DATES	\$TIMES

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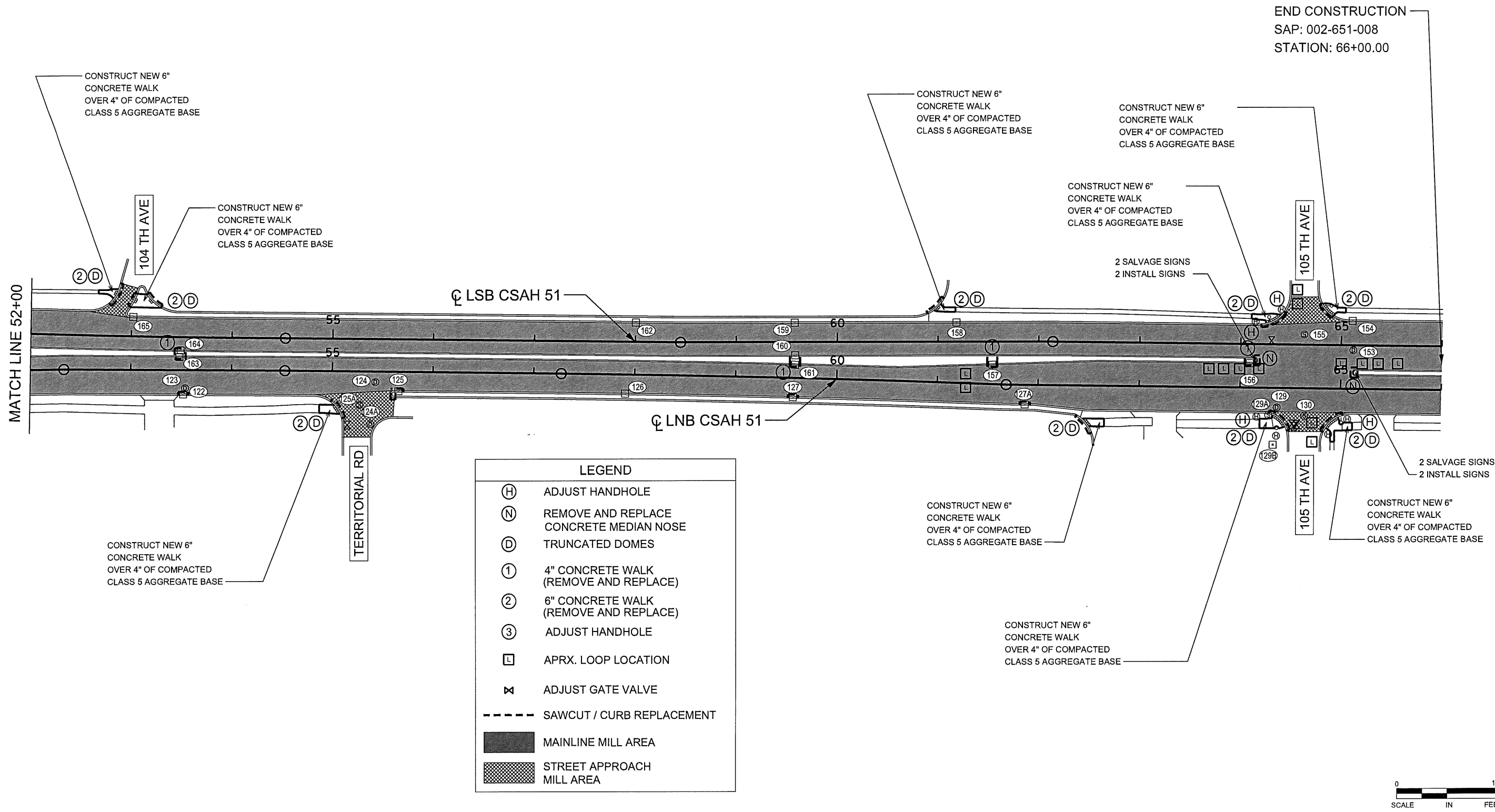
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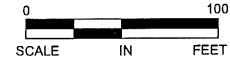
**ANOKA COUNTY**  
HIGHWAY DEPT.

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CONSTRUCTION PLAN  
STA 39+00 TO 52+00  
Sheet 20 of 32 Sheets



LEGEND	
(H)	ADJUST HANDHOLE
(N)	REMOVE AND REPLACE CONCRETE MEDIAN NOSE
(D)	TRUNCATED DOMES
(1)	4" CONCRETE WALK (REMOVE AND REPLACE)
(2)	6" CONCRETE WALK (REMOVE AND REPLACE)
(3)	ADJUST HANDHOLE
[L]	APRX. LOOP LOCATION
[X]	ADJUST GATE VALVE
---	SAWCUT / CURB REPLACEMENT
[Solid Grey]	MAINLINE MILL AREA
[Hatched Grey]	STREET APPROACH MILL AREA



NO	DATE	BY	CKD	APPR	REVISION	\$DATES	\$TIMES

NAME: \$DGN\$

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**ANOKA COUNTY**  
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CONSTRUCTION PLAN

STA 52+00 TO 66+00

Sheet 21 of 32 Sheets

**PERMANENT PAVEMENT MARKING PLAN  
NOTES AND GUIDELINES**

**GENERAL INFORMATION:**

THE ENGINEER'S INVOLVEMENT IN THE APPLICATION OF THE MATERIAL SHALL BE LIMITED TO FIELD CONSULTATION AND INSPECTION. ANOKA COUNTY HIGHWAY DEPARTMENT WILL PLACE NECESSARY "SPOTTING" AT APPROPRIATE POINTS TO PROVIDE HORIZONTAL CONTROL FOR STRIPING AND TO DETERMINE NECESSARY STARTING AND CUTOFF POINTS, LONGITUDINAL JOINTS, PAVEMENT EDGES AND EXISTING MARKINGS MAY SERVE AS HORIZONTAL CONTROL WHEN SO DIRECTED.

EDGE LINES AND LANE LINES ARE TO BE BROKEN ONLY AT INTERSECTIONS WITH PUBLIC ROADS AND AT PRIVATE ENTRANCES IF THEY ARE CONTROLLED BY A YIELD SIGN, STOP SIGN OR TRAFFIC SIGNAL. THE BREAK POINT IS TO BE AT THE START OF THE RADIUS FOR THE INTERSECTION OR AT MARKED STOP LINES OR CROSSWALKS.

A TOLERANCE OF 1/4 INCH UNDER OR 1/4 INCH OVER THE SPECIFIED WIDTH WILL BE ALLOWED FOR STRIPING PROVIDED THE VARIATION IS GRADUAL AND DOES NOT DETRACT FROM THE GENERAL APPEARANCE. BROKEN LINE SEGMENTS MAY VARY UP TO ONE-HALF FOOT FROM THE SPECIFIED LENGTHS PROVIDED THE OVER AND UNDER VARIATIONS ARE REASONABLY COMPENSATORY. ALIGNMENT DEVIATIONS FROM THE CONTROL GUIDE SHALL NOT EXCEED 1 INCH. MATERIAL SHALL NOT BE APPLIED OVER LONGITUDINAL JOINTS, ESTABLISHMENT OF APPLICATION TOLERANCES SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLY AS CLOSELY AS PRACTICABLE WITH THE PLANNED DIMENSIONS.

**EPOXY:**

THE ROAD SURFACE SHALL BE CLEANED AT THE DIRECTION OF THE ENGINEER JUST PRIOR TO APPLICATION. PAVEMENT CLEANING SHALL CONSIST OF AT LEAST BRUSHING WITH A ROTARY BROOM (NON-METALLIC) OR AS RECOMMENDED BY THE MATERIAL MANUFACTURER AND ACCEPTABLE TO THE ENGINEER. NEW PORTLAND CEMENT CONCRETE SURFACES SHALL BE SANDBLAST CLEANED TO REMOVE ANY SURFACE TREATMENT AND/OR LAITANCE ON LOW SPEED (SPEED LIMIT 35 MPH OR LESS) URBAN PORTLAND CEMENT CONCRETE ROADWAYS. SANDBLAST CLEANING SHALL BE USED FOR ALL EPOXY PAVEMENT MARKINGS.

THE EPOXY MARKING APPLICATION SHALL IMMEDIATELY FOLLOW THE PAVEMENT CLEANING. GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE EPOXY RESIN LINE TO PROVIDE AN IMMEDIATE NO-TRACK SYSTEM.

AN EPOXY RESIN LINE 4" WIDE AND 15 MILL THICKNESS (WET), REQUIRES AN APPLICATION RATE OF ONE (1) GALLON OF COMPONENTS FOR 320 FEET OF LINE. GLASS BEADS SHALL BE APPLIED AT A POUND PER GALLON RATE SUFFICIENT TO ACHIEVE AN ACCEPTABLE NO-TRACK SYSTEM.

OPERATIONS SHALL BE CONDUCTED ONLY WHEN THE ROAD PAVEMENT SURFACE TEMPERATURES ARE 50 DEGREES FAHRENHEIT OR GREATER.

PERMANENT PAVEMENT MARKINGS SHALL NOT BE PLACED OVER TEMPORARY TAPE MARKINGS.

**PREFORMED THERMOPLASTIC:**

THE PREFORMED THERMOPLASTIC MARKINGS SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS ON CLEAN AND DRY SURFACES. SEE SPECIAL PROVISIONS FOR PREFORMED THERMOPLASTIC MARKING SPECIFICATIONS.

**PAINT:**

AT THE TIME OF APPLYING THE MARKING MATERIAL, THE APPLICATION AREA SHALL BE FREE OF CONTAMINATION. THE CONTRACTOR SHALL CLEAN THE ROADWAY SURFACE PRIOR TO THE LINE APPLICATION IN A MANNER AND TO THE EXTENT REQUIRED BY THE ENGINEER.

GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE PAINT LINE.

EXCEPT WHEN USED AS A TEMPORARY MARKING, PAVEMENT MARKINGS SHALL ONLY BE APPLIED IN SEASONABLE WEATHER WHEN AIR TEMPERATURE IS 50 DEGREES FARHENHEIT OR HIGHER AND SHALL NOT BE APPLIED WHEN THE WIND OR OTHER CONDITIONS CAUSE A FILM OR DUST TO BE DEPOSITED ON THE PAVEMENT SURFACE AFTER CLEANING AND BEFORE THE MARKING MATERIAL CAN BE APPLIED.

THE FILLING OF TANKS, POURING OF MATERIALS OR CLEANING OF EQUIPMENT SHALL NOT BE PERFORMED ON UNPROTECTED PAVEMENT SURFACES UNLESS ADEQUATE PROVISIONS ARE MADE TO PREVENT SPILLAGE OF MATERIAL.

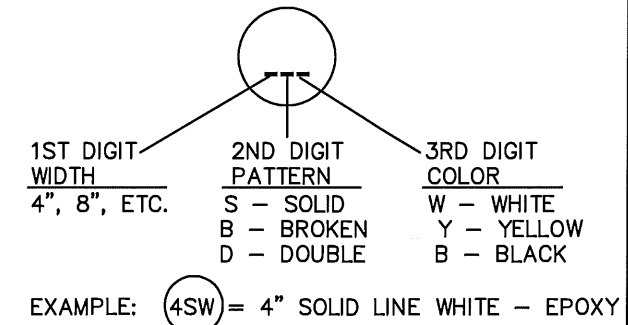
PERMANENT MARKING QUANTITIES		
ITEM	UNIT	TOTAL QUANTITY
4" SOLID LINE WHITE - EPOXY PAINT	LIN FT	14365
4" BROKEN LINE WHITE - EPOXY PAINT	LIN FT	1120
4" SOLID LINE YELLOW - EPOXY PAINT	LIN FT	10420
24" SOLID LINE WHITE - PREFORMED THERMOPLASTIC	SQ FT	630
3' X 6' ZEBRA CROSSWALK - PREFORMED THERMOPLASTIC	SQ FT	1728
PAVEMENT MESSAGE (LFT ARROW) - PREFORMED THERMOPLASTIC	SQ FT	90
PAVEMENT MESSAGE (RT ARROW) - PREFORMED THERMOPLASTIC	SQ FT	75

**SYMBOLS & MATERIALS LEGEND**

- CROSSWALK BLOCK WHITE PREFORMED THERMOPLASTIC
- ← PAVEMENT MESSAGE (LEFT ARROW) PREFORMED THERMOPLASTIC

**STRIPING KEY**

- CIRCLE - EPOXY
- SQUARE PREFORMED THERMOPLASTIC
- △ TRIANGLE - PAINT
- ⬠ PENTAGON - REMOVABLE PREFORMED PLASTIC MARKING



NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\16-01-00\CSAH 51\BaselTraffic\Perm pvmt mrkg guide notes\_guidelines.dwg

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PRINT NAME: MATTHEW J. JOHN

SIGNATURE: *Matthew J. John*

DATE: 3/8/2017 LICENSE NO. 51639

DRAWN BY: RLB DATE: 1/30/17

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CHECKED BY: JR DATE: 1/30/17



**ANOKA COUNTY  
HIGHWAY DEPT.**

STATE PROJECT NO. \_\_\_\_\_

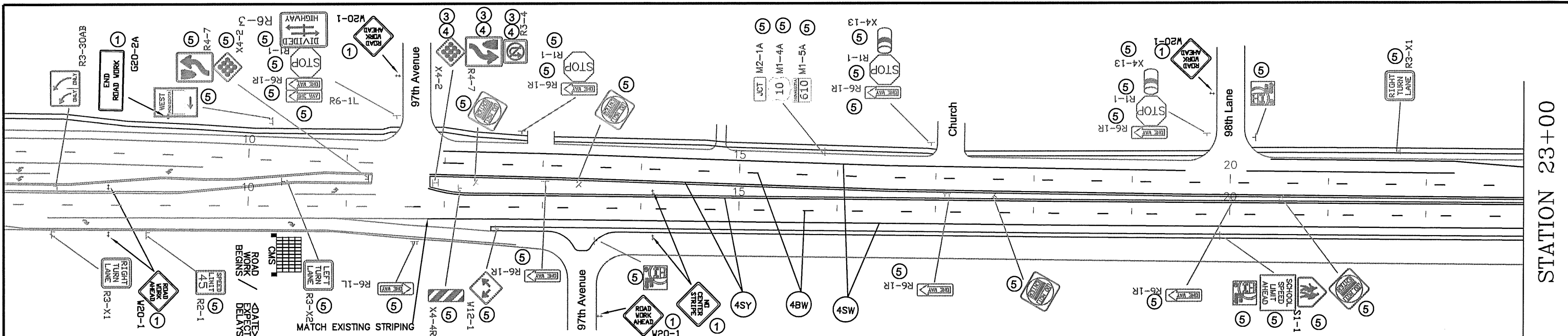
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STATE AID PROJECT NO. \_\_\_\_\_

COUNTY PROJECT NO. \_\_\_\_\_

PERMANENT MARKING  
TABULATION

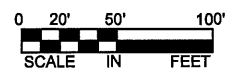
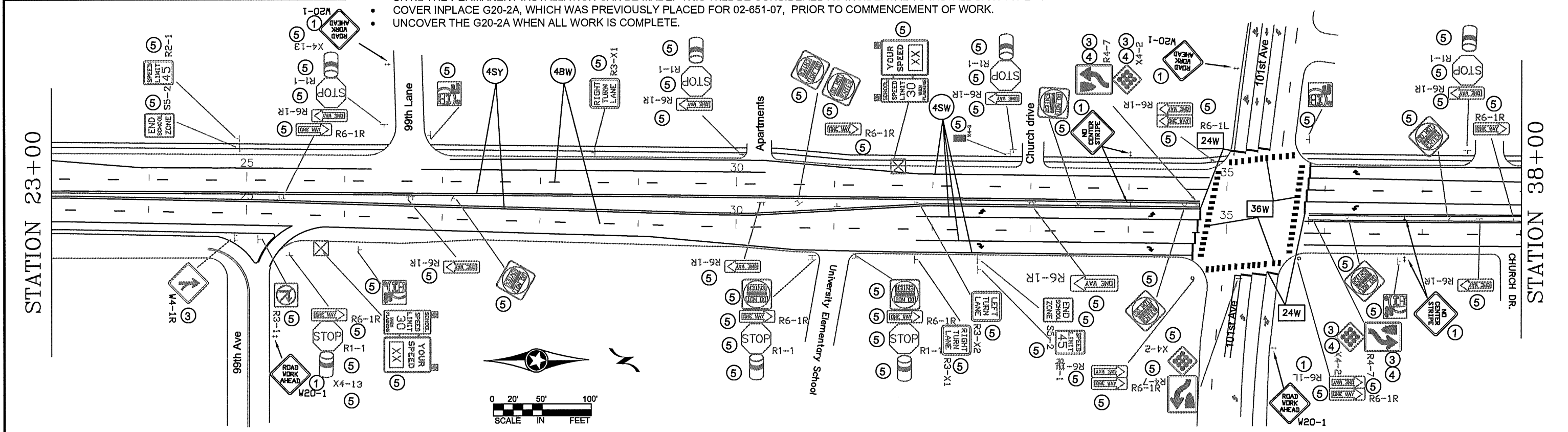
Sheet 22 of 32 Sheets



**NOTES:**

- ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE TO THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD), INCLUDING PART VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".
- CONTRACTOR SHALL COMPLY WITH THE LONGITUDINAL DROP-OFF GUIDELINES AS PER THE FIELD MANUAL.
- LOCATIONS OF PAVEMENT MARKINGS ARE APPROXIMATE. EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- CONTRACTOR SHALL SUPPLY AND INSTALL THE PORTABLE CHANGEABLE MESSAGE SIGN (CMS) A MINIMUM OF SEVEN DAYS PRIOR TO ACTUAL COMMENCEMENT OF ROAD WORK, TO A LOCATION AS SPECIFIED BY THE ENGINEER. SIGNS TO BE REMOVED WHEN ROAD WORK BEGINS. PAYMENT SHALL BE MADE AS PER ITEM 2563.613 PORTABLE CHANGEABLE MESSAGE SIGN BY THE UNIT/DAY.
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- ALL PERMANENT STRIPING AND PAVEMENT MESSAGES SHALL BE PLACED WITHIN 72 HOURS OF MAINLINE PAVING.
- ANY REQUIRED PERMANENT SIGNING SHALL BE INSTALLED THE SAME DAY AS PERMANENT STRIPING
- ALL EXISTING SIGNING SHALL REMAIN IN PLACE DURING CONSTRUCTION. ALL SALVAGED AND REINSTALLED SIGNS SHALL BE INSTALLED ON TEMPORARY SUPPORTS UNTIL THE PERMANENT INSTALLATION CAN BE MADE. THIS WILL BE CONSIDERED AS INCIDENTAL TO INSTALL SIGN TYPE C.
- COVER INPLACE G20-2A, WHICH WAS PREVIOUSLY PLACED FOR 02-651-07, PRIOR TO COMMENCEMENT OF WORK.
- UNCOVER THE G20-2A WHEN ALL WORK IS COMPLETE.

- SIGN NOTES:**
- ① TEMPORARY TRAFFIC CONTROL SIGN
  - ② F & I PERMANENT SIGN
  - ③ SALVAGE PERMANENT SIGN
  - ④ RE-INSTALL PERMANENT SIGN
  - ⑤ RETAIN INPLACE SIGN
  - ⑥ COVER INPLACE SIGN



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.  
 PRINT NAME: MATTHEW J. JOHN  
 SIGNATURE: *[Signature]*  
 DATE: 3/8/2017 REG. NO. 51639

DRAWN BY: RLB DATE 1/9/17  
 DESIGN BY: RLB DATE 1/9/17  
 CHECKED BY: JR DATE 1/9/17

**ANOKA COUNTY**  
**HIGHWAY DEPT.**

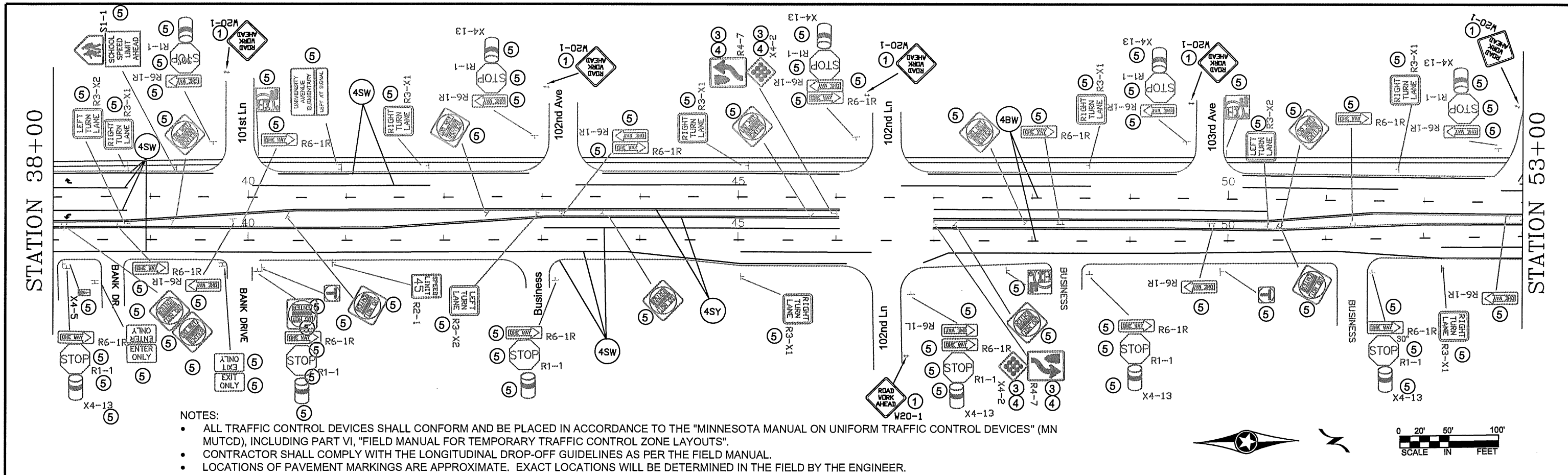
STATE PROJECT NO. \_\_\_\_\_  
 STATE AID PROJECT NO. 002-651-008  
 STATE AID PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. \_\_\_\_\_

**TEMPORARY SIGNING,  
 PERMANENT SIGNING  
 AND STRIPING**

Sheet 23 of 32 Sheets

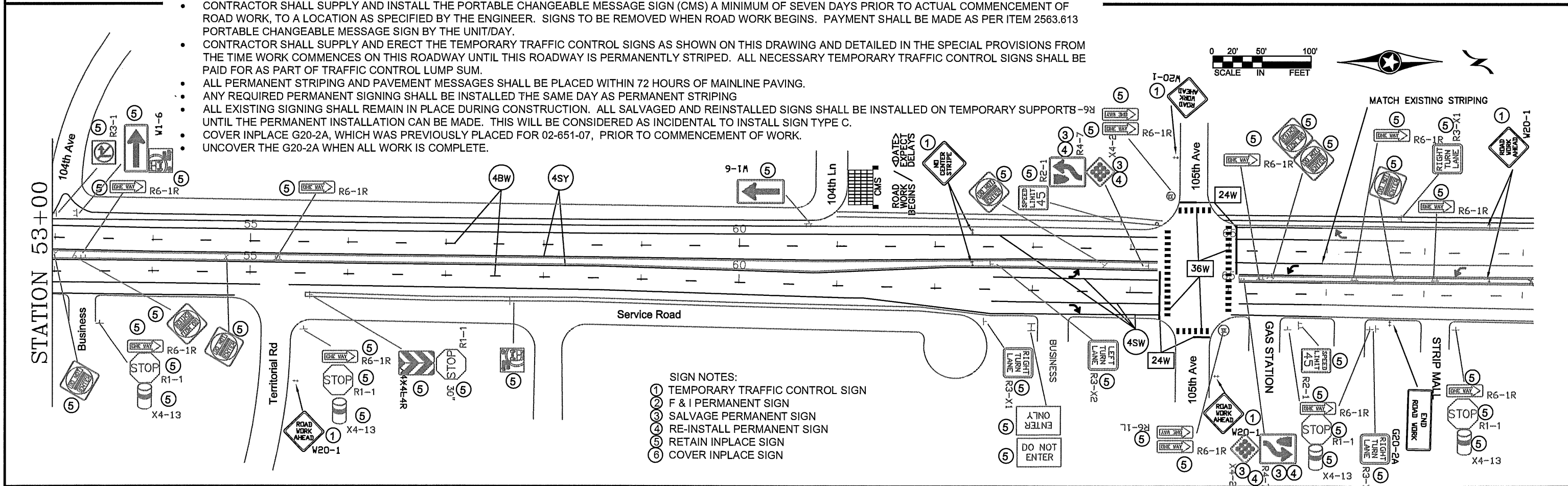
NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\02-617-19\base\Traffic\Curves from CSAH 18 to CSAH 22.dwg



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  - ⑥ COVER INPLACE SIGN

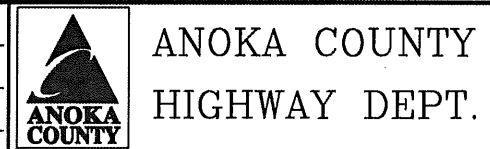
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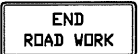










STATE PROJECT NO. \_\_\_\_\_  
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 STATE AID PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. \_\_\_\_\_

TEMPORARY SIGNING,  
 PERMANENT SIGNING  
 AND STRIPING

Sheet 24 of 32 Sheets



TEMPORARY TRAFFIC CONTROL SIGNS						
M.U.T.C.D. CODE	SIZE	PANEL AREA FT. <sup>2</sup>	INSERT	QUANTITY		MOUNTING HEIGHT TO PAVEMENT EDGE FT.
					No. POST	
W8-12	48" x 48"	16.00		8	2	7.0'
R4-1	24" x 30"	5.00		0	1	7.0'
R4-2	24" x 30"	5.00		0	1	7.0'
G20-2A	48" x 24"	8.00		2	2	7.0'
W8-1A	48" x 48"	16.00		AS NEEDED		
W8-1A	48" x 48"	16.00		AS NEEDED		
W8-8	48" x 48"	16.00		AS NEEDED		
W8-9	48" x 48"	16.00		AS NEEDED		
	48" x 48"	16.00		AS NEEDED		
W8-11	48" x 48"	16.00		AS NEEDED		
W20-1	48" x 48"	16.00		AS NEEDED (ESTIMATED 20)		
CMS sign to be installed a minimum of seven days prior to actual commencement of road work. Signs to be removed when road work begins.				2		

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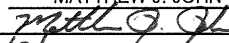
CHANGEABLE MESSAGE BOARD - MESSAGE SEQUENCE LAYOUT

		R	O	A	D		
		W	O	R	K		
	B	E	G	I	N	S	
	<	D	A	T	E	>	
	E	X	P	E	C	T	
	D	E	L	A	Y	S	

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NO	DATE	BY	CKD	APPR	REVISION

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 DATE: 3/8/2017 REG. NO. 51639

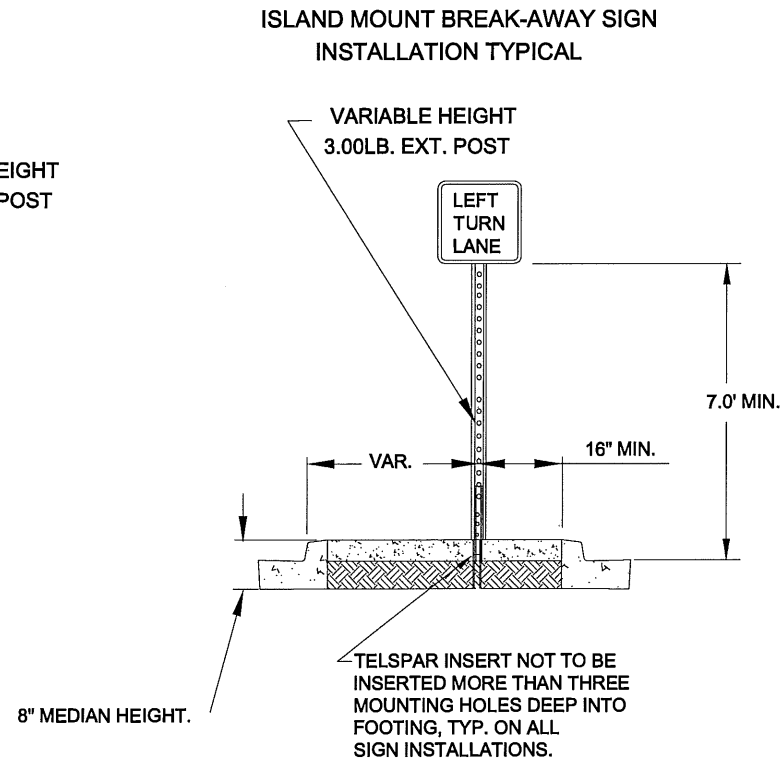
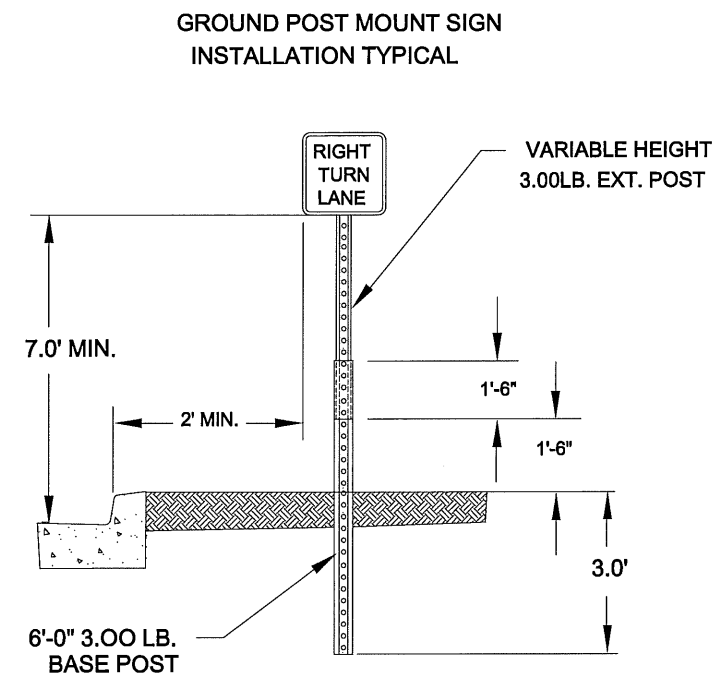
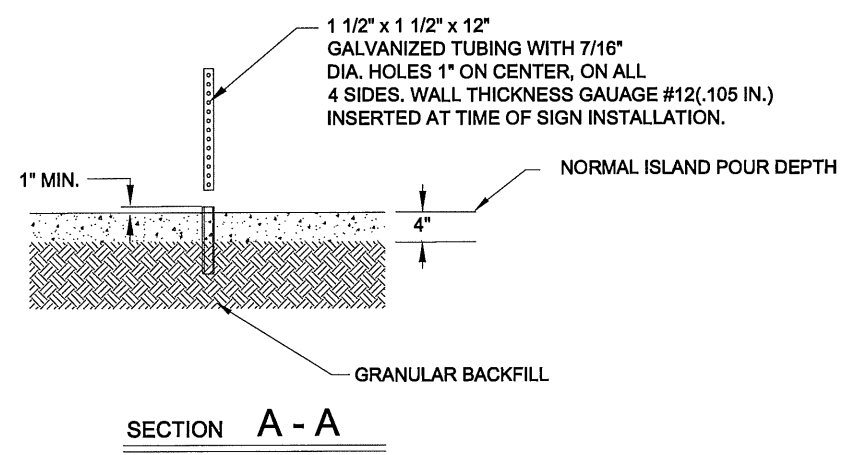
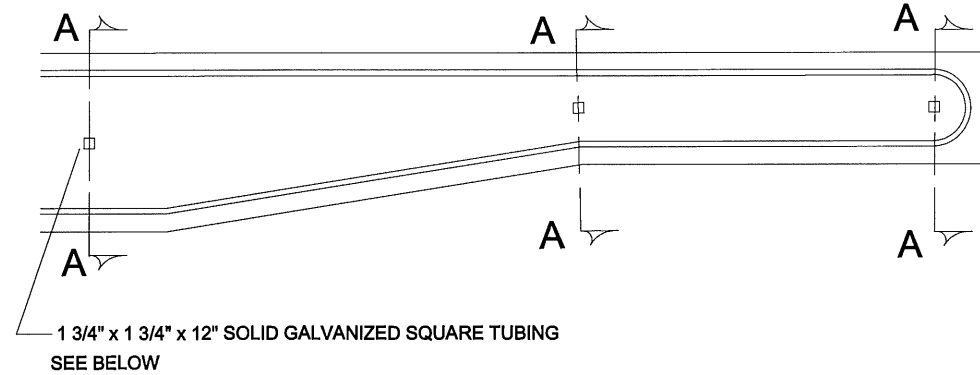
DRAWN BY: RLB DATE: 1/9/17  
 DESIGN BY: RLB DATE: 1/9/17  
 CHECKED BY: JR DATE: 1/9/17



ANOKA COUNTY  
 HIGHWAY DEPT.

STATE PROJECT NO. \_\_\_\_\_  
 STATE AID PROJECT NO. 002-651-008  
 STATE AID PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. \_\_\_\_\_

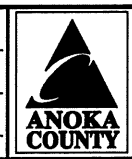
TRAFFIC CONTROL QUANTITY  
 Sheet 25 of 32 Sheets



NO	DATE	BY	CKD	APPR	REVISION

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 DATE: 3/8/2017 REG. NO. 51639

DRAWN BY: RLB DATE: 1/30/17  
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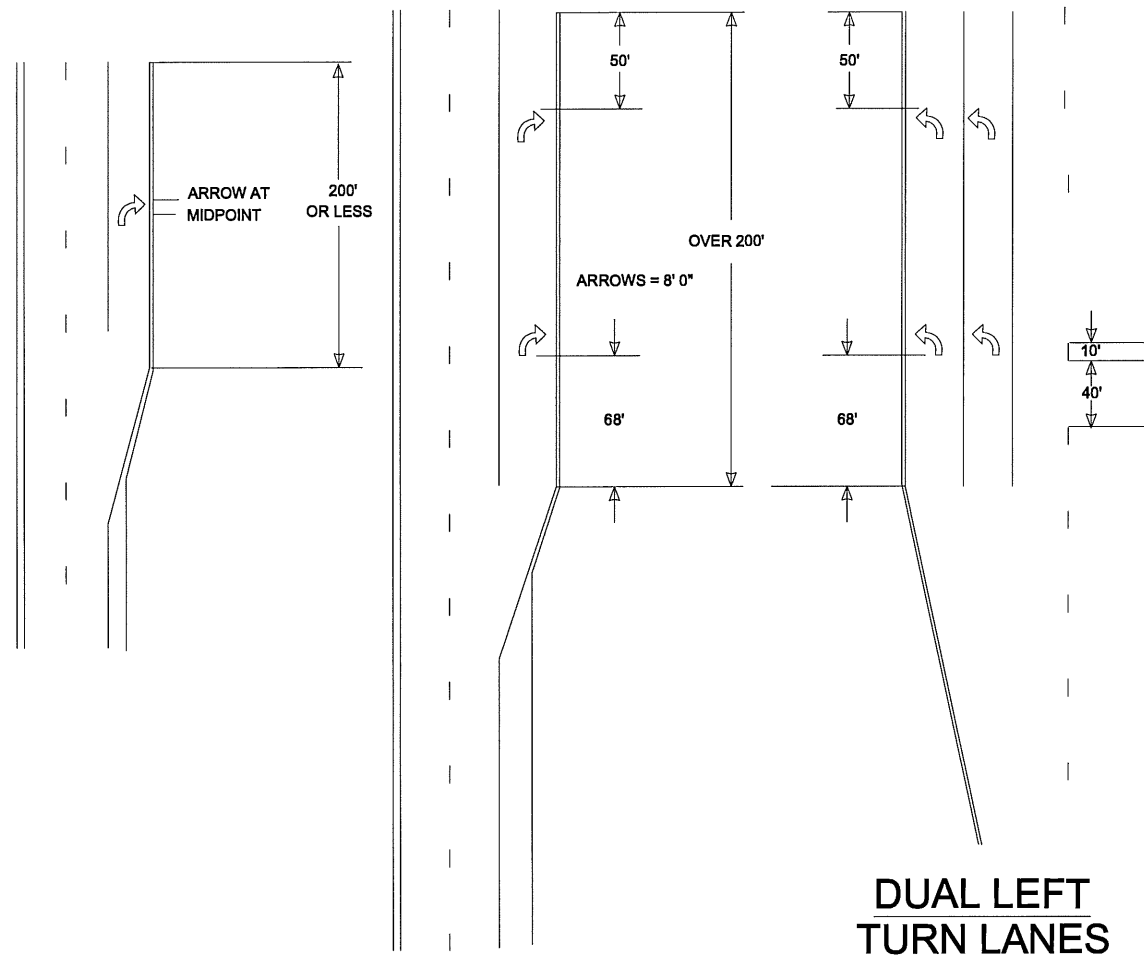


**ANOKA COUNTY  
 HIGHWAY DEPT.**

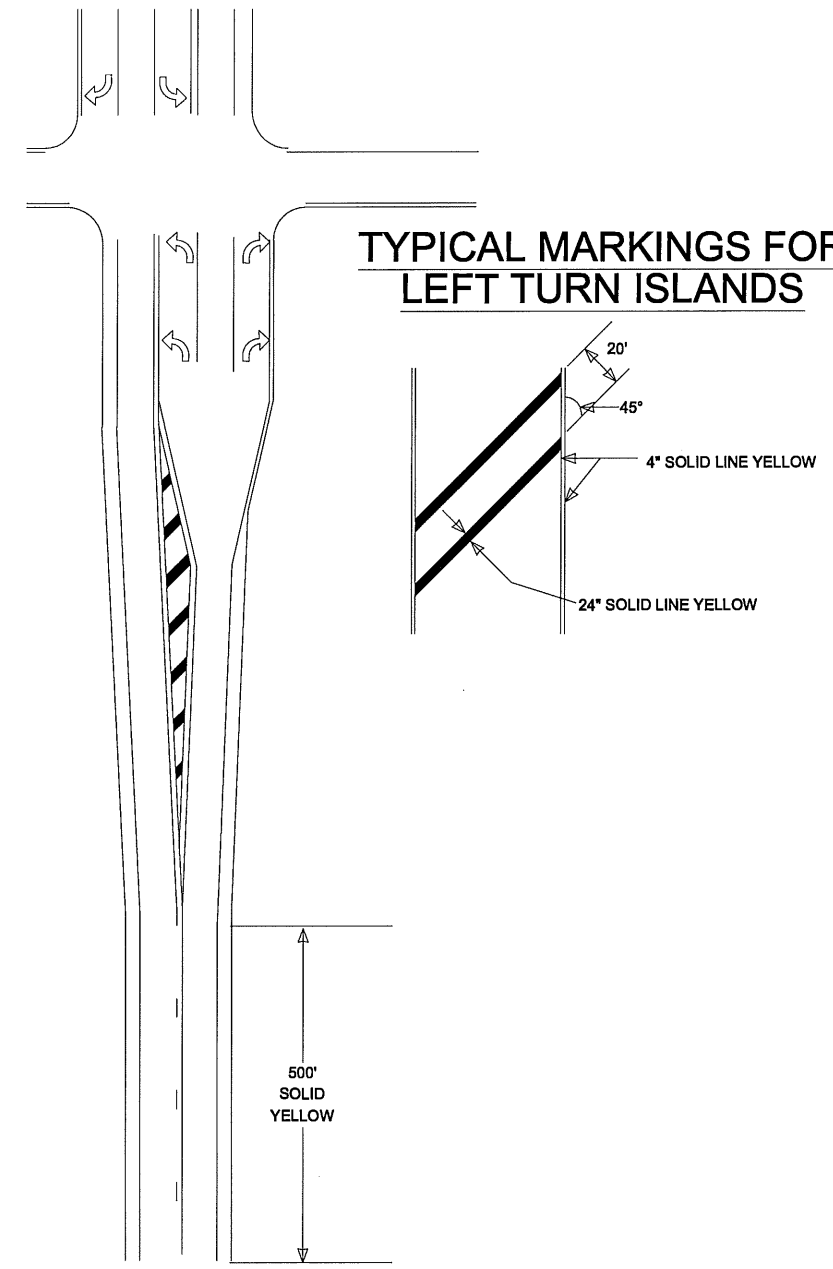
STATE PROJECT NO. \_\_\_\_\_  
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SIGNING & STRIPING  
 DETAILS  
 Sheet 26 of 32 Sheets

**TYPICAL MESSAGE PLACEMENT  
FOR TURN LANES**



**TYPICAL MARKINGS FOR  
LEFT TURN ISLANDS**



NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\16-01-00\CSAH 51\Bases\Traffic\Signing\_Striplng.dwg

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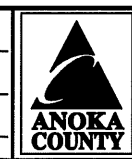
SIGNATURE: *Matthew J. John*

DATE: 3/8/2017 REG. NO. 51639

DRAWN BY: RLB DATE: 1/30/17

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**ANOKA COUNTY  
HIGHWAY DEPT.**

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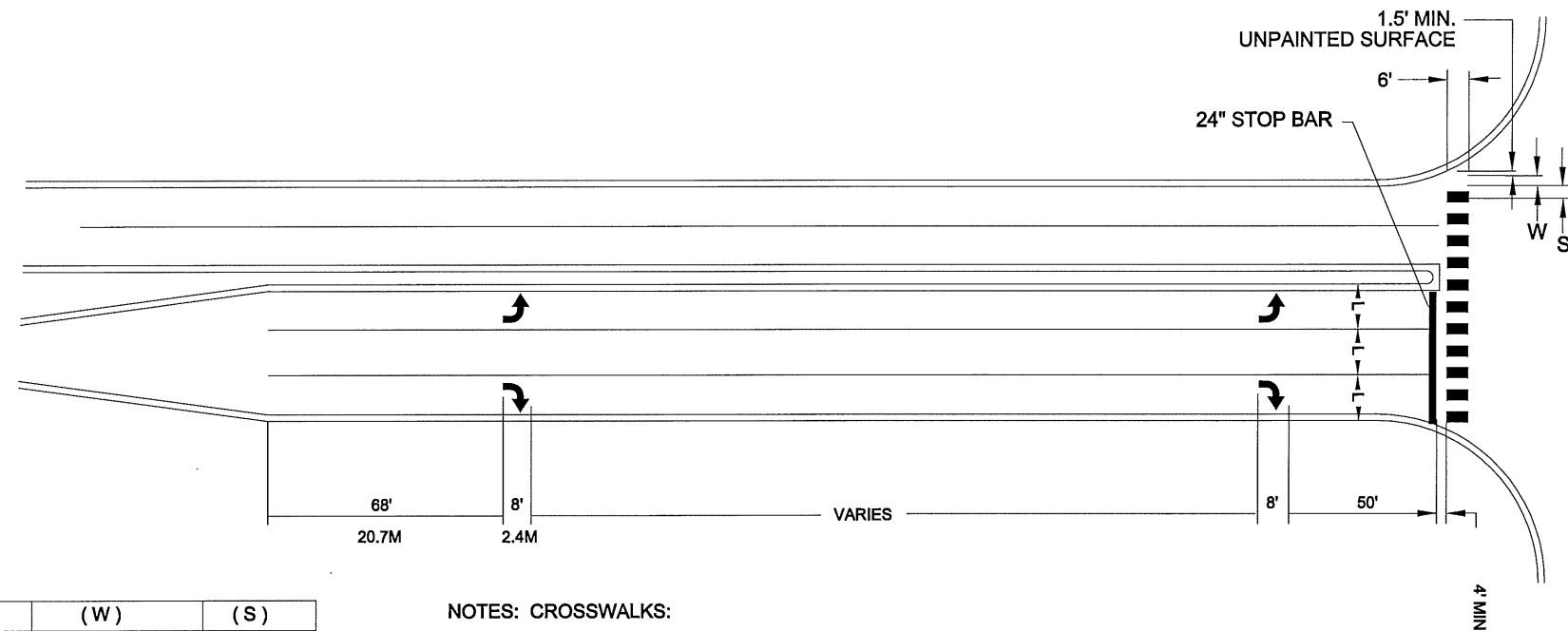
STATE AID PROJECT NO. \_\_\_\_\_

COUNTY PROJECT NO. \_\_\_\_\_

SIGNING & STRIPING  
DETAILS

Sheet 27 of 32 Sheets

# MARKINGS FOR PEDESTRIAN CROSSWALKS



(L)	(W)	(S)
WIDTH OF INSIDE LANE	WIDTH OF PAINTED AREAS	WIDTH OF SPACE
9'	2.0'	2.5'
10'	2.5'	2.5'
11'	2.5'	3.0'
12'	3.0'	3.0'
13'	3.0'	3.5'

**NOTES: CROSSWALKS:**

- 1.) PAINTED AREAS ARE TO BE CENTERED ON CENTER AND LANE LINES, EVEN IF INTERSECTION IS NOT ALIGNED.
- 2.) LOCATION OF ZEBRA CROSSWALKS AND STOP BARS, SIGNAL LOOPS AND PED RAMPS ARE APPROXIMATE. FINAL LOCATIONS ARE TO BE DETERMINED AND FIELD VERIFIED DURING CONSTRUCTION BY THE FIELD ENGR.
- 3.) ZEBRA CROSSWALKS ARE TO BE PARALLEL TO THE DRIVING LANE OR LANES, EVEN IF THE STREET IS ON AN ANGLE TO THE INTERSECTION.
- 4.) A MIN. OF 1.5' (450mm) CLEAR DISTANCE MUST BE LEFT ADJACENT TO THE CURB. IF LAST PAINTED AREA FALLS INTO THIS AREA, IT MUST BE OMITTED.
- 5.) ON TWO LANE STREETS, USE SPACING SHOWN FOR AN 11' (3.3mm) INSIDE LANE.

NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\16-01-00\CSAH 51\Bases\Traffic\Signing\_Striping.dwg

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SIGNING & STRIPING  
DETAILS

Sheet 28 of 32 Sheets

- 1) LOCATION OF LOOP DETECTORS, POLE BASES AND HANGHOLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- 2) EACH SIGNAL FACE SHALL BE 12'-3 SECTION R-Y-G EXCEPT THAT SIGNAL FACES (1), (2), (3) AND (4) SHALL BE 12'-3 SECTION R-Y-G, (5) AND (6) SHALL BE 12'-5 SECTION R-Y-G-Y-LTA-GLTA AND (7) AND (8) SHALL BE 12'-5 SECTION R-Y-G-Y-LTA-GLTA.
- 3) SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- 4) EACH SIGNAL FACE SHALL HAVE BACKGROUND SHIELD.
- 5) EACH PEDESTRIAN INDICATION SHALL BE 12"x12".
- 6) EACH LUMINAIRE SHALL INCLUDE PHOTOELECTRIC CELL AND STREET LIGHT CHECK SWITCH.
- 7) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLN) IN 1" M.M.D. SEE SPECIAL PROVISIONS AND DETAILS.
- 8) EACH NEW HANGHOLE SHALL BE CONCRETE HANGHOLE WITH TYPE "C" COVER PER M/DOT STANDARD PLATE NO. 81177.

**EMERGENCY VEHICLE PRE-EMPTION SYSTEM "Y"**

**NOTE:**  
ALL COMPONENTS OF SIGNAL SYSTEM, EXCEPT THE EQUIPMENT TO BE FURNISHED AND INSTALLED AS INDICATED IN THE PLAN, ARE SUPPLIED AND SHALL REMAIN IN PLACE AT THE TIME OF THE SIGNAL SYSTEM. SEE SPECIAL PROVISIONS FOR REQUIRED EQUIPMENT IN CONTRACTOR SPECIFIC AND ADDITIONAL INFORMATION.

**LEGEND:**  
A NOT SHOWN TO BE F & I AS PART OF THE SYSTEM  
B NOT SHOWN TO BE F & I AS PART OF THE SYSTEM  
C NOT SHOWN TO BE F & I AS PART OF THE SYSTEM  
D NOT SHOWN TO BE F & I AS PART OF THE SYSTEM

CONTRACTOR SHALL FURNISH & INSTALL THE FOLLOWING MATERIALS ON MAST ARM POLE 3:  
ONE WAY EVP DETECTOR (SEE SPECIAL PROVISIONS), MOUNT ON SIDE OF POLE THAT IS 90° FROM ROADWAY.

F & I ONE WAY EVP DETECTOR AND INDICATOR LIGHT (# 4) - OVERHEAD  
A1-3/c#12  
A1-3/c#20

3) TYPE A100-A-50-D40-8 (DAVT AT 355)  
A100 POLE FOUNDATION  
3-ONE WAY SIGNALS-OVERHEAD  
2-TYPE 108-POLE MOUNTED 90° AND 180°  
LUMINAIRE-200 WATT H.P.S.  
MID MAST ARM MOUNTS AT 12' AND 24'  
2-PEDESTRIAN PUSH BUTTONS  
TYPE "D" SIGN PANEL (72"x18")-OVERHEAD  
EXTEND INTO H.H.11:  
3-T.R.S.C.  
3-12/c#12  
1-3/c#12  
2-1/c#10

CONTRACTOR SHALL FURNISH & INSTALL THE FOLLOWING MATERIALS ON MAST ARMS 1, 2, 3 AND 4:  
ONE WAY EVP DETECTOR AND INDICATOR LIGHT AT APPROX. 4 FEET FROM THE LEFT END OF THE MAST ARM.

2) TYPE A100-A-45-D40-8 (DAVT AT 355)  
A100 POLE FOUNDATION  
3-ONE WAY SIGNALS-OVERHEAD  
2-TYPE 108-POLE MOUNTED 90° AND 180°  
LUMINAIRE-200 WATT H.P.S.  
MID MAST ARM MOUNT AT 12'  
2-PEDESTRIAN PUSH BUTTONS  
TYPE "D" SIGN PANEL (72"x18")-OVERHEAD  
EXTEND INTO H.H.14:  
3-T.R.S.C.  
3-12/c#12  
1-3/c#12  
2-1/c#10

ANTICIPATED COUNTY WORK AT SYSTEM (AT NO COST TO THE CONTRACTOR), TO ACCOMMODATE EVP: MODIFICATIONS TO INPLACE CABINET.

F & I ONE WAY EVP DETECTOR AND INDICATOR LIGHT (# B) - OVERHEAD  
A1-3/c#12  
A1-3/c#20

4) TYPE A100-A-40-D40-8 (DAVT AT 355)  
A100 POLE FOUNDATION  
2-ONE WAY SIGNALS-OVERHEAD  
2-TYPE 108-POLE MOUNTED 90° AND 180°  
LUMINAIRE-200 WATT H.P.S.  
MID MAST ARM MOUNT AT 12'  
2-PEDESTRIAN PUSH BUTTONS  
TYPE "D" SIGN PANEL (72"x18")-OVERHEAD  
EXTEND INTO H.H.17:  
3-T.R.S.C.  
3-12/c#12  
1-3/c#12  
2-1/c#10

**SIGNAL FACES**

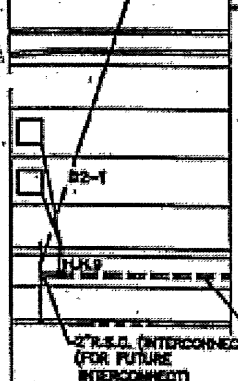
SIGNAL FACE	SIGNAL INDICATIONS ARE 12"			SIGNAL FACE	SIGNAL INDICATIONS ARE 12"		
	LED	Y	G		LED	Y	G
1-1, 1-2				1-1, 1-2			
2-1, 2-2, 2-3				2-1, 2-2, 2-3			
4-1, 4-2				4-1, 4-2			
4-3, 4-4				4-3, 4-4			
5-1, 5-2				5-1, 5-2			
6-1, 6-2, 6-3				6-1, 6-2, 6-3			
8-1, 8-2				8-1, 8-2			
8-3, 8-4				8-3, 8-4			

A) CONTROLLER AND CABINET CABINET FOUNDATION EXTENDED INTO H.H.20:  
METERED SIGNAL SERVICE  
1 1/2-T.R.S.C.  
3-1/c#4  
EXTEND INTO H.H.11:  
4-T.R.S.C.  
6-12/c#12  
2-3/c#12  
13-3/c#14  
EXTEND INTO H.H.3:  
4-T.R.S.C.  
6-12/c#12  
2-3/c#12  
3-2/c#14  
3-2/c#14  
STUB OUT 2-T.R.S.C.  
AND EXTEND INTO H.H.1 (INTERCONNECT):  
1-8P/1R (INTERCONNECT)  
1-8P/1R (INTERCONNECT)  
2-T.R.S.C. (INTERCONNECT)  
1-8P/1R (INTERCONNECT)

B) SERVICE CABINET CABINET FOUNDATION EXTENDED INTO H.H.20:  
METERED SIGNAL SERVICE  
1 1/2-T.R.S.C.  
3-1/c#4  
EXTEND INTO H.H.1:  
UNMETERED STREET LIGHT SERVICE  
1 1/2-T.R.S.C.  
6-1/c#10  
BETWEEN H.H.1 AND H.H.3:  
2-T.R.S.C.  
4-1/c#10  
2-T.R.S.C. STUB OUT-INPLACE (FOR SERVICE BY AED)

MATCH LINE STATION 78+15 (FOR FUTURE INTERCONNECT)

CSAH 51 (45 MPH)



**LOOP DETECTORS**

NUMBER	SIZE (F.L.)	LOCATION	FUNCTION
D1-1	2-8x8	18'	1
D1-2	2-8x8	6'	1
D2-1	2-8x8	300'	1
D3-1	2-8x8	40'	1
D4-1	2-8x8	INPLACE	5,8
D4-2	2-8x8	5'	7
D4-3	2-8x8	8'	1
D4-4	2-8x8	8'	1
D5-1	2-8x8	16'	1
D5-2	2-8x8	7'	1
D6-1	2-8x8	300'	1
D7-1	2-8x8	40'	1
D8-1	2-8x8	INPLACE	5,8
D8-2	2-8x8	5'	7
D8-3	2-8x8	5'	1
D8-4	2-8x8	5'	1

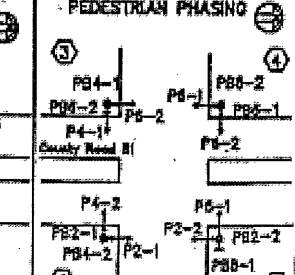
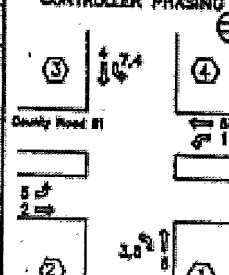
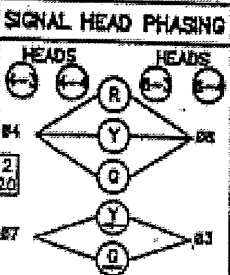
- LOOP DETECTOR FUNCTIONS:**
- 1) CALL AND EXTEND
  - 2) CALL ONLY
  - 3) EXTEND ONLY
  - 4) CALL ONLY DENSITY
  - 5) DELAYED CALL ONLY
  - 6) DELAYED CALL ONLY DENSITY
  - 7) DELAYED CALL-IMMEDIATE EXTEND
  - 8) CARRY OVER (STRETCH)
  - 9) ADVISORY DETECTOR
  - 10) SAMPLING DETECTOR
  - 11) SPECIAL DETECTOR

NOTE: LOCATION = DISTANCE FROM STOP BAR TO LOOP DETECTOR.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



BLAINE/COON RAPIDS, MINNESOTA  
ANOKA COUNTY



7259

NOTE: CONTRACTOR SHALL CHECK EACH MAST ARM POLE FOR HUBS AND SHALL FURNISH AND INSTALL ANY OTHER EVP WORK. SEE SPECIAL PROVISIONS.



FOR REFERENCE PURPOSES ONLY



NOTES:

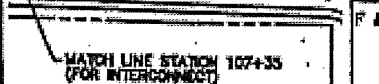
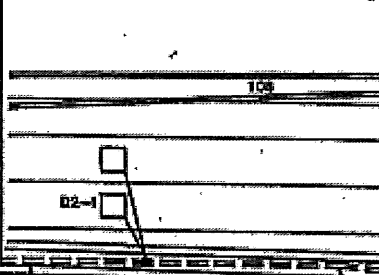
- LOCATION OF CONTROLLER CABINET, SERVICE CABINET, LOOP DETECTORS, POLE BASES AND HANDHOLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- EACH SIGNAL FACE SHALL BE 12"-3 SECTION R-Y-G, EXCEPT THAT SIGNAL FACES (1), (2), (3) AND (4) SHALL BE 12"-3 SECTION R-LTA-Y-LTA-G-LTA.
- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- EACH SIGNAL FACE SHALL HAVE BACKGROUND SHIELD.
- EACH PEDESTRIAN INDICATION SHALL BE 12"x12".
- EACH LUMINAIRE SHALL INCLUDE PHOTOELECTRIC CELL AND STREET LIGHT CHECK SWITCH.
- SEE SPECIAL PROVISIONS AND DETAILS FOR ANOKA COUNTY SERVICE CABINET INFORMATION.
- SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- LOOP DETECTOR WIRE SHALL BE CROSS-LINKED POLYETHYLENE (XLPE) IN TYPICAL SEE SPECIAL PROVISIONS AND DETAILS.
- EACH HANDHOLE SHALL BE CONCRETE HANDHOLE WITH TYPE "C" COVER PER Mn/DOT STANDARD PLATE INDUSTRY.

CONTRACTOR SHALL FURNISH AND INSTALL NEW LED RED SIGNAL INDICATORS IN EACH SIGNAL FACE WITH EIP SYSTEM INSTALLATION. SEE SPECIAL PROVISIONS.

CONTRACTOR SHALL BALANCE ALL INPLACE PEDESTRIAN SIGNAL INDICATORS (WITH ATTACHED POLE MOUNTED BRACKET) AND INPLACE RED INDICATOR WIRE AND SHALL FURNISH AND INSTALL NEW ONE RED SIGNAL HAND PALETTE PER INDICATOR. MID-OR PED INDICATOR WIRE AND POLE MOUNTED BRACKET AT EACH LOCATION SHALL BE USED. SEE SPECIAL PROVISIONS AND DETAILS.

ANTICIPATED COUNTY WORK AT SYSTEM (AT NO COST TO THE CONTRACTOR), TO ACCOMMODATE E.V.P. MODIFICATIONS TO INPLACE CABINET.

CSAH 51 (45 MPH)



LOOP DETECTORS				
NUMBER	SIZE (ft.)	LOCATION	FUNCTION	
D1-1	2-8x8	35'	7	
D1-2	2-8x8	8'	7	
D2-1	2-8x8	300'	1	
D4-1	8x8	120'	3,8	
D4-2	2-8x8	8'	7	
D5-1	2-8x8	35'	7	
D5-2	2-8x8	5'	7	
D6-1	2-8x8	300'	1	
D6-2	8x8	110'	3,8	
D8-1	2-8x8	8'	7	
D8-2	2-8x8	8'	7	

NOTE: LOCATION=DISTANCE FROM STOP BAR TO LOOP DETECTOR.

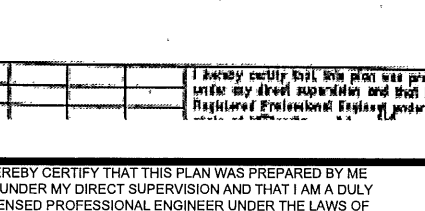
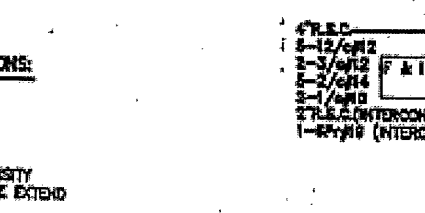
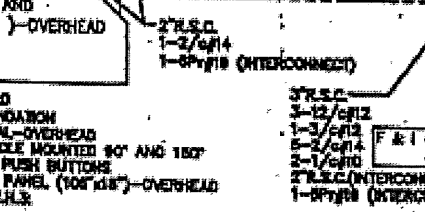
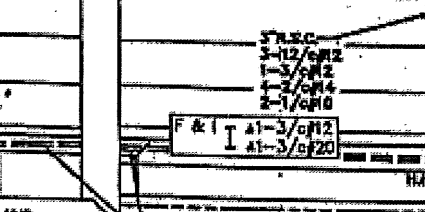
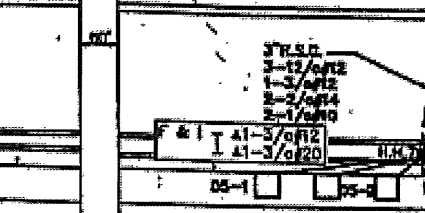
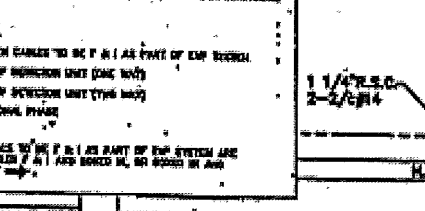
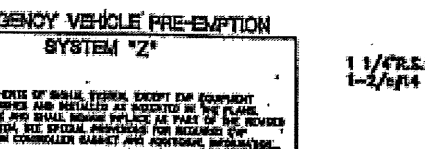
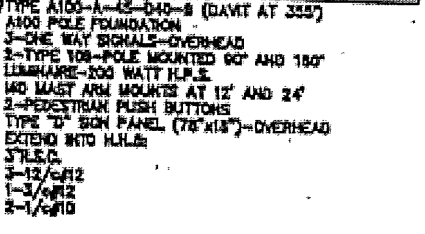
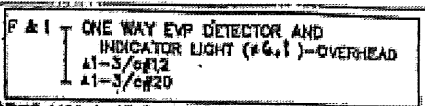
- LOOP DETECTOR FUNCTIONS:
- CALL AND EXTEND
  - CALL ONLY
  - EXTEND ONLY
  - CALL ONLY DENSITY
  - DELAYED CALL ONLY
  - DELAYED CALL ONLY DENSITY
  - DELAYED CALL-IMMEDIATE EXTEND
  - CARRY OVER (STRETCH)
  - ADVISORY DETECTOR
  - SAMPLING DETECTOR
  - SPECIAL DETECTOR

EMERGENCY VEHICLE PRE-EMPTION SYSTEM "2"

NOTE: ALL COMPONENTS OF SIGNAL SYSTEM, EXCEPT EIP EQUIPMENT TO BE FURNISHED AND INSTALLED AS SPECIFIED BY THIS PLAN, ARE INPLACE AND SHALL REMAIN IN PLACE AS PART OF THE EXISTING SIGNAL SYSTEM. SEE SPECIAL PROVISIONS FOR REPAIRS OF EQUIPMENT IN CONTROLLER CABINET AND CONTROLLER INFORMATION.

- LEGEND:
- ▲ NEW SIGNALS TO BE INSTALLED AS PART OF EIP SYSTEM
  - EIP INDICATOR UNIT (ONE WAY)
  - ← EIP INDICATOR UNIT (TWO WAY)
  - SIGNAL FACE

ALL HANDHOLES TO BE INSTALLED AS PART OF EIP SYSTEM ARE OTHER LABELS "A" AND "B" AND "C" IN ORDER IN AND ORDER BY →



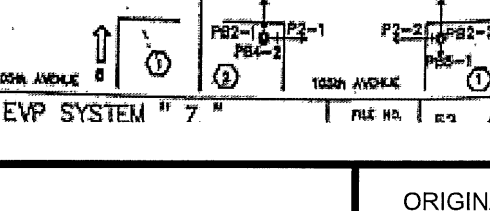
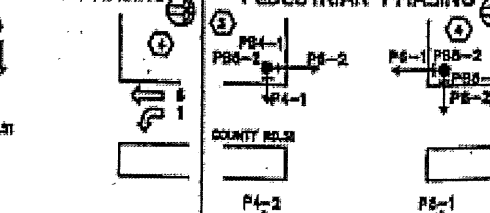
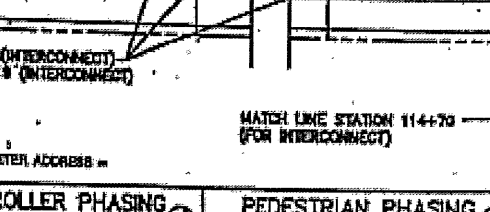
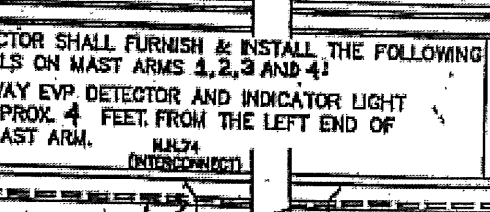
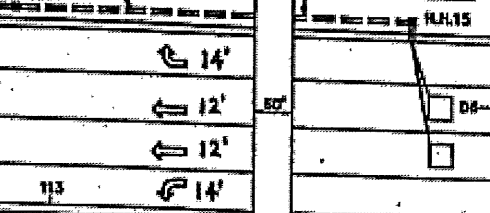
SIGNAL INDICATIONS ARE 12"

SIGNAL FACE	LED			LED		
	R	Y	G	R	Y	G
1-1, 1-2	●	●	●	←	←	←
2-1, 2-2, 2-3	●	●	●	←	←	←
4-1, 4-2, 4-3	●	●	●	←	←	←
5-1, 5-2	●	●	●	←	←	←
6-1, 6-2, 6-3	●	●	●	←	←	←
8-1, 8-2, 8-3	●	●	●	←	←	←

NOTE: CONTRACTOR SHALL CHECK EACH MAST ARM POLE FOR HUBS AND SHALL FURNISH AND INSTALL ANY HUBS THAT ARE NEEDED PRIOR TO BEGINNING ANY OTHER E.V.P. WORK. SEE SPECIAL PROVISIONS.



INSTALL CONTROLLER AND CABINET (FURNISHED BY COUNTY)  
CABINET FOUNDATION  
EXTEND INTO H.H.10:  
METERED SIGNAL SERVICE  
1 1/4" R.S.C.  
3-1/4" DIA.  
EXTEND INTO H.H.11:  
4" R.S.C.  
5-1/2" DIA.  
2-3/4" DIA.  
7-3/4" DIA.  
EXTEND INTO H.H.11:  
4" R.S.C.  
5-1/2" DIA.  
2-3/4" DIA.  
7-3/4" DIA.  
EXTEND INTO H.H.11:  
4" R.S.C.  
5-1/2" DIA.  
2-3/4" DIA.  
7-3/4" DIA.  
EXTEND INTO H.H.11:  
4" R.S.C.  
5-1/2" DIA.  
2-3/4" DIA.  
7-3/4" DIA.



FOR REFERENCE PURPOSES ONLY

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.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
PRINT NAME: MATTHEW J. JOHN  
SIGNATURE: *Matthew J. John*  
DATE: 3/8/2017 LICENSE NO. 51639

DRAWN BY: KPR DATE: 01/20/2017  
DESIGN BY: KPR DATE: 01/20/2017  
CHECKED BY: MJJ DATE: 02/03/2017



ANOKA COUNTY  
HIGHWAY DEPT.

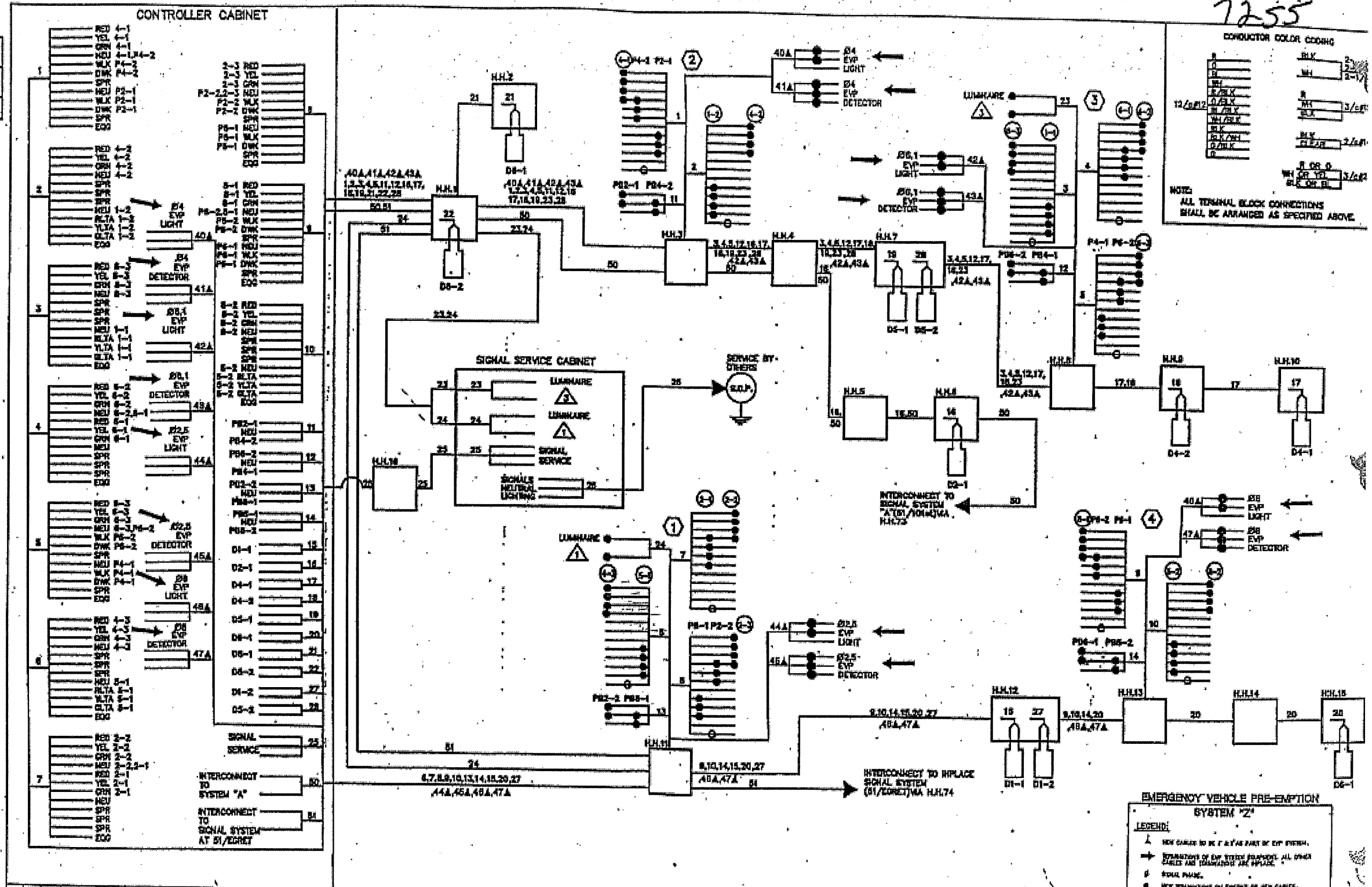
STATE AID PROJECT 002-651-008

ORIGINAL SIGNAL PLANS

Sheet 31 of 32 Sheets

NO.	DATE	BY	CKD	APPR	REVISION	SDATES	STIMES

NAME: SDGNS



FOR REFERENCE PURPOSES ONLY

NO.	BY	DATE	REVISION	ITEM	DESCRIPTION

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

PRINT NAME: MATTHEW J. JOHN  
 SIGNATURE: *Matthew J. John*  
 DATE: 3/8/2017 LICENSE NO. 51639

**BLAINE/COON RAPIDS, MINNESOTA**  
**ANOKA COUNTY**  
 S.A.P. 106-020-13, 114-020-16

**ES&H**

**EVP SYSTEM "Z"**  
**FIELD WIRING DIAGRAM**

FILE NO. 54  
 BLAINE02  
 047