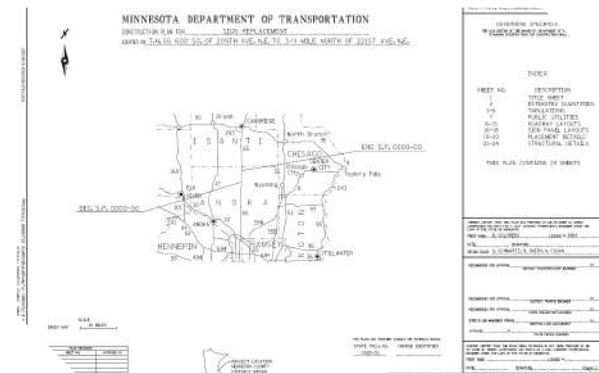


Chapter 6

Signing Plan Design & Plan Sets

Sign Plan Design for At-Grade Intersections

June 2017

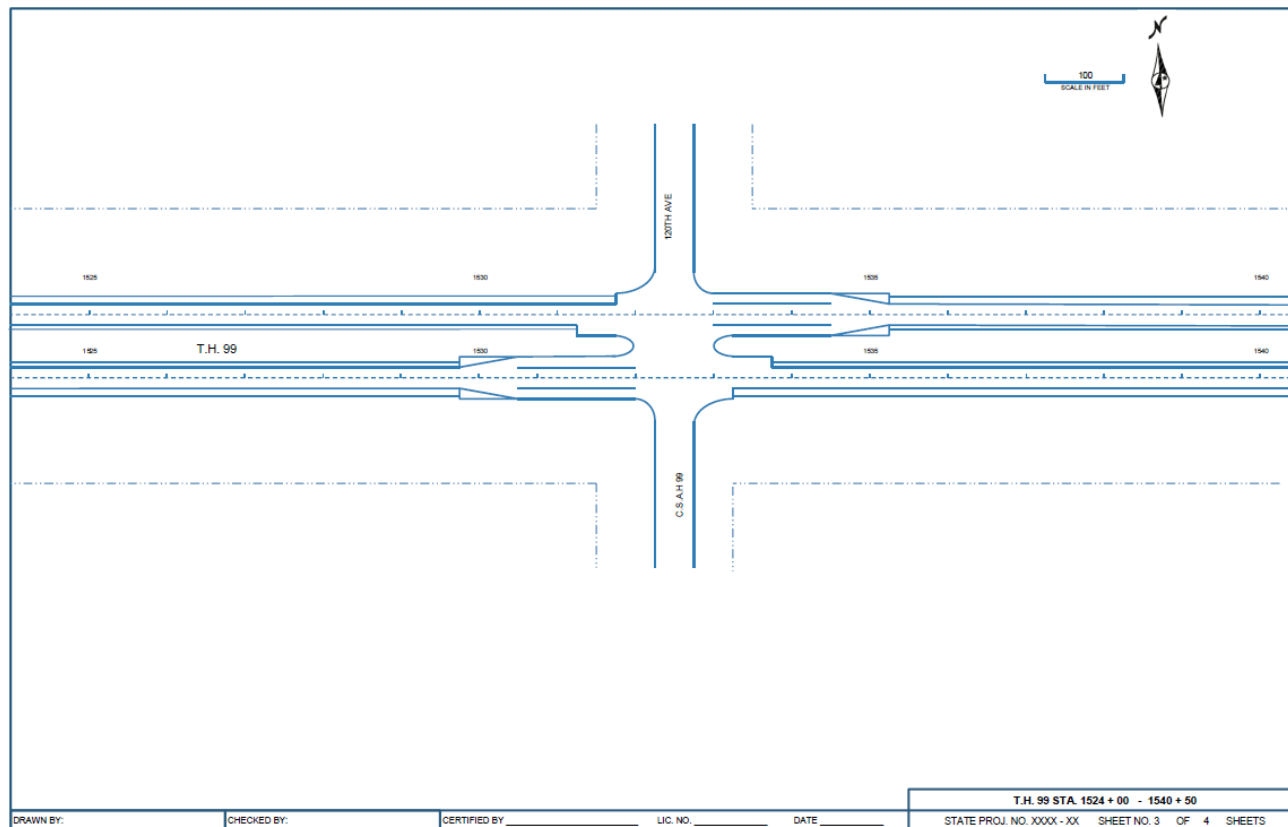


Signing Plan Assembly Steps

- **Download latest plan set assembly steps from OTST website**
- **Sample plans organized to follow an established format**
- **When proceeding through steps, refer to sample plans**

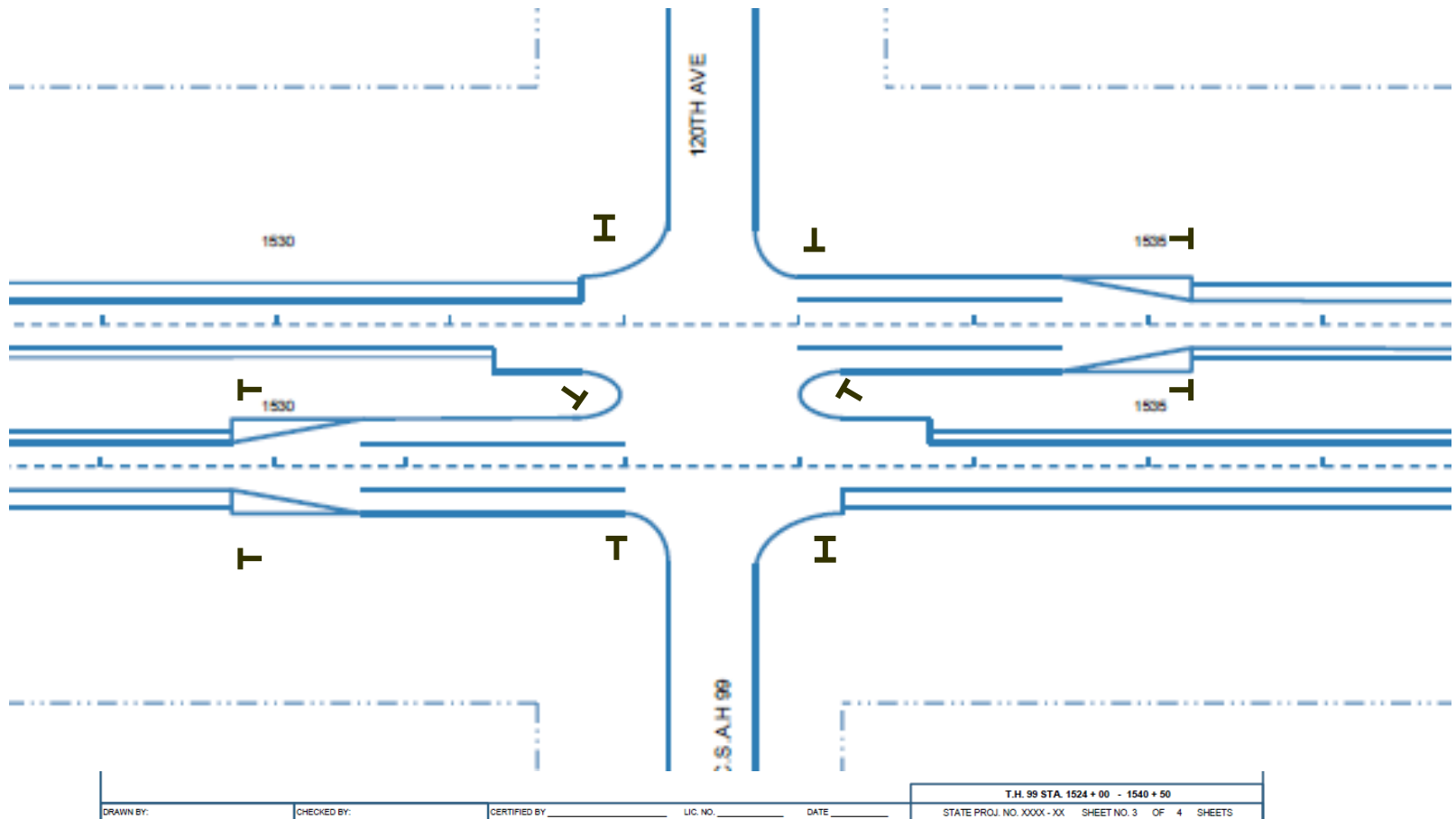
Signing Plan Assembly Steps

- Begin with a Microstation seed file
- Attach coordinate correct reference files (roadway mapping and alignments)



Signing Plan Assembly Steps

- Place all signs on roadway plan sheet for each direction of travel (Use figures in [TEM](#) and [MN MUTCD](#))



Signing Plan Assembly Steps

- Place all signs on roadway plan sheet for each direction of travel (Use figures in TEM and MN MUTCD)
 - See MN MUTCD and TEM for placement and spacing
 - Design all necessary guide signs in SignCAD
 - Refer to MnDOT Traffic Guide Sign Design Manual for standards and procedures



NOTE: For signing plans involving replacement of existing signs, a complete field review is required to document sign legends, sign sizes and existing sign structures.

Signing Plan Assembly Steps

- Label signs in an orderly fashion beginning at the left edge of the first sheet and progressing through the last roadway sheet
 - NOTE: refer to the TEM Chapter 6 section 6-4 for information on how MnDOT classifies signs by design type (A, C, D, EA, EO and OH)
 - New signs get labeled with their sign type and a unique A type number similar to an OH sign number.
 - EXAMPLE: A I94-001, A I94-002, A MN280-001 etc. for new A signs. C-1, C-2, C-3 etc. for new C signs. D-1, D-2, for new D signs

Signing Plan Assembly Steps

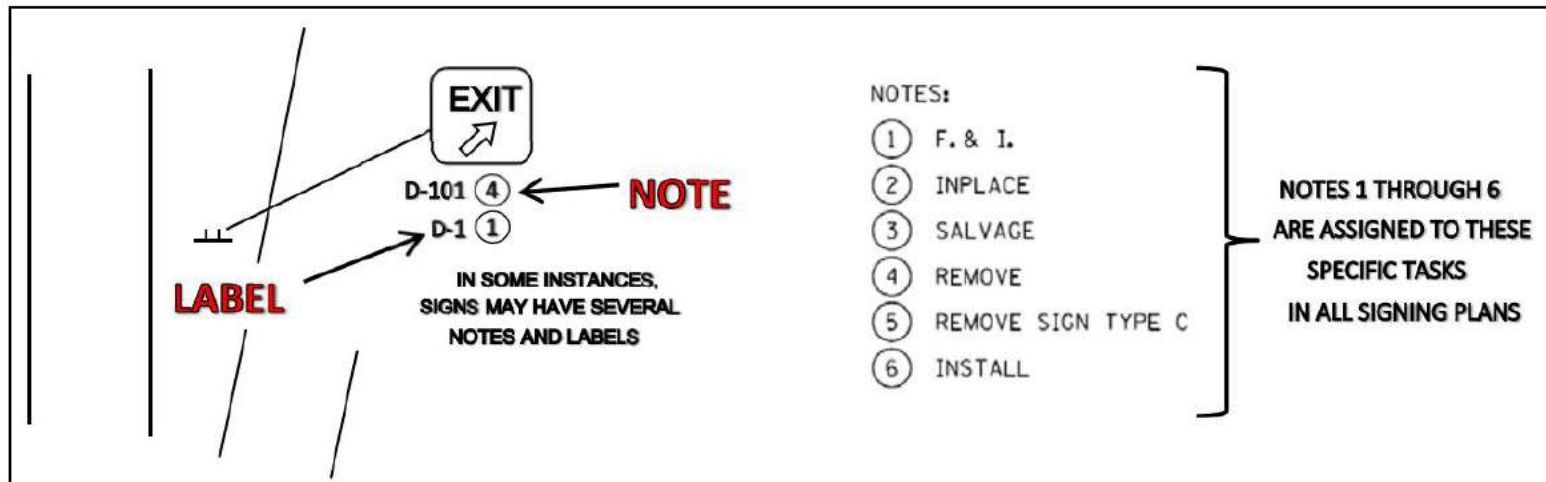
- Existing signs being removed are labeled with their sign type and a sequential number beginning with 101
- Except Type C signs and Delineators and Markers
 - EXAMPLE: A I94-101, A I04-102, A MN280-101 etc. for Type A signs being removed. D-101, D-102, for Type D signs being removed. * C signs being removed DO NOT NEED TO BE LABELLED THIS WAY. C signs are shown on the roadway and totaled in the Statement of Estimated quantities, but do not need to be labelled C-101, C102) *See sample Signing plans.



NOTE: Different labels are required if the signs have differences in mounting, size, etc. (for example, a 36" x 36" STOP sign needs a different label than a 48" x 48" STOP sign, or a 36" x 36" R5-1 sign mounted on U posts in dirt would get a different label than a 36" x 36" R5-1 mounted on a square tube post in concrete)

Signing Plan Assembly Steps

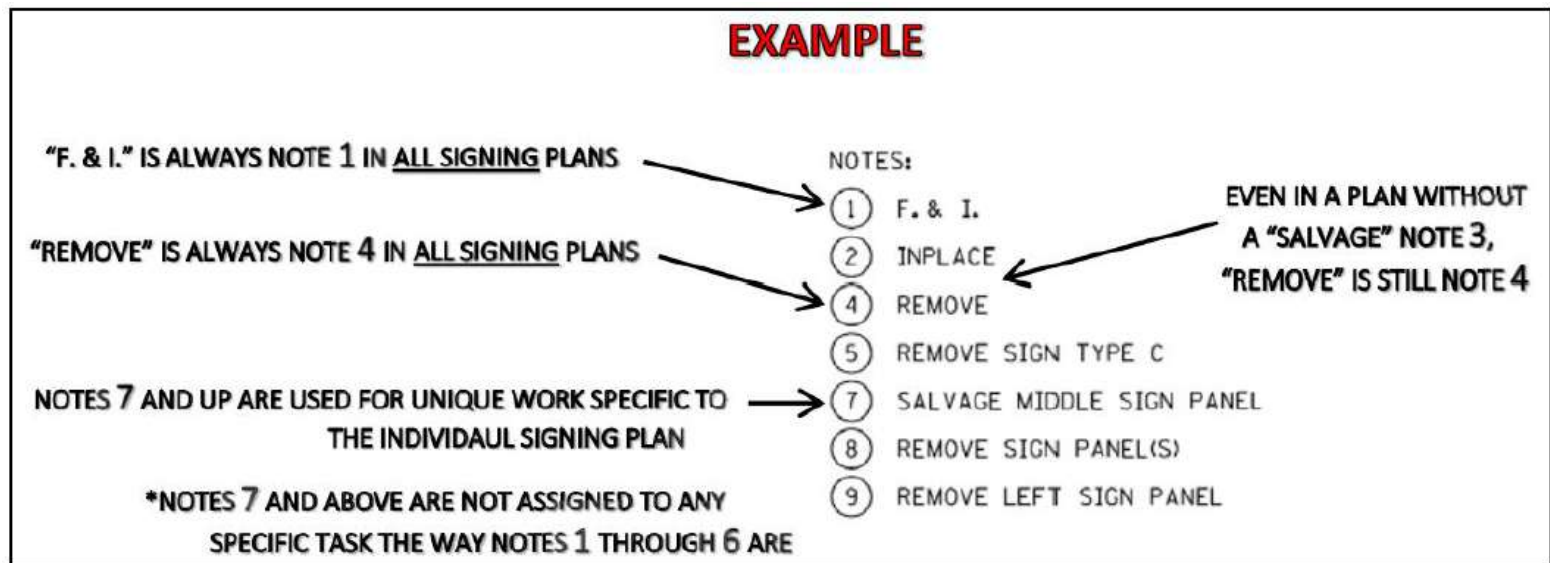
- Circled numbers (notes) describing the work to be done to the sign follow the label



- Notes 1 through 6 describe common signing situations or tasks and are consistent in all signing plans

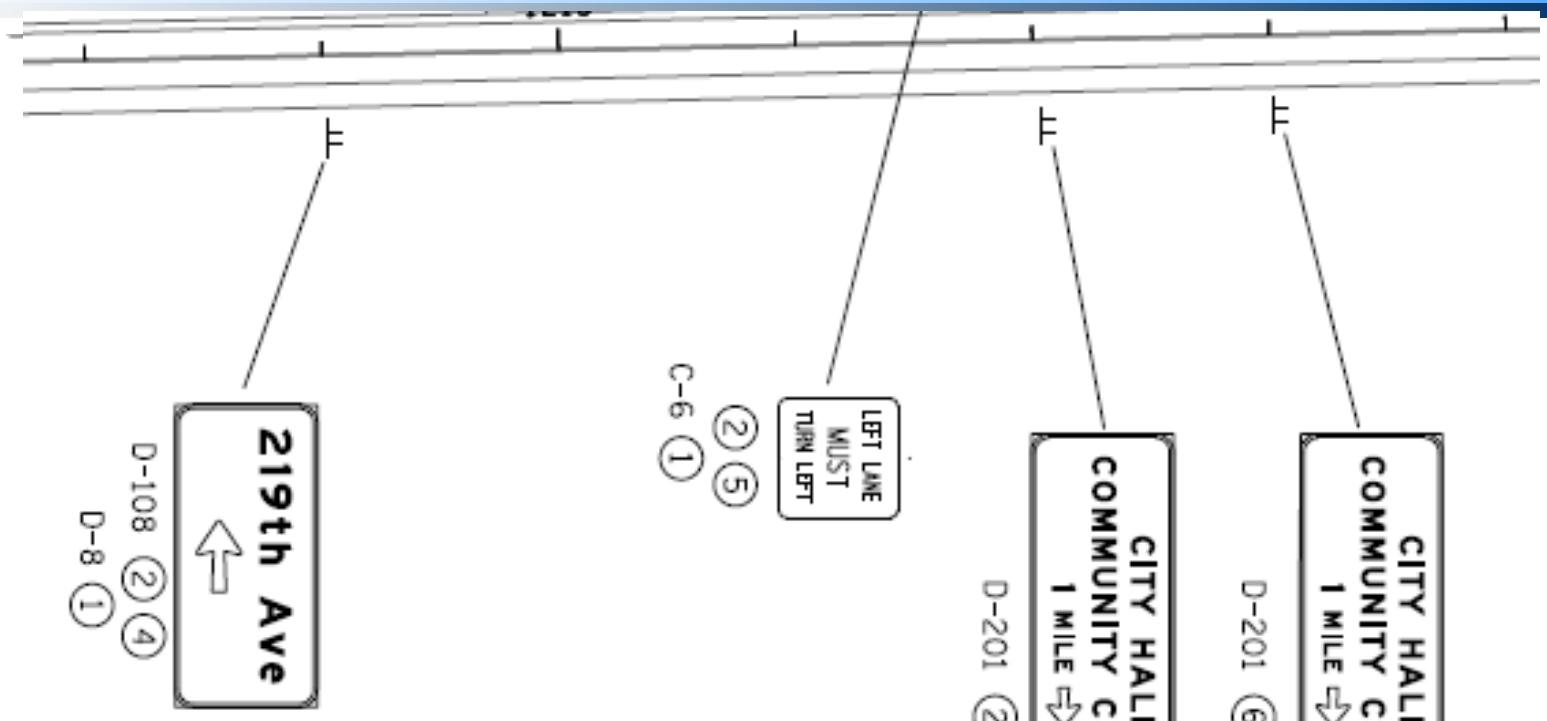
Signing Plan Assembly Steps

- Notes 7 and beyond will vary by plan depending on the work required in the individual signing plan



- Type OH signs have a unique numbers assigned to them. Contact the OTST Signing Unit to obtain new OH sign numbers (Brian Barrett 651-234-7374)

Signing Plan Assembly Steps

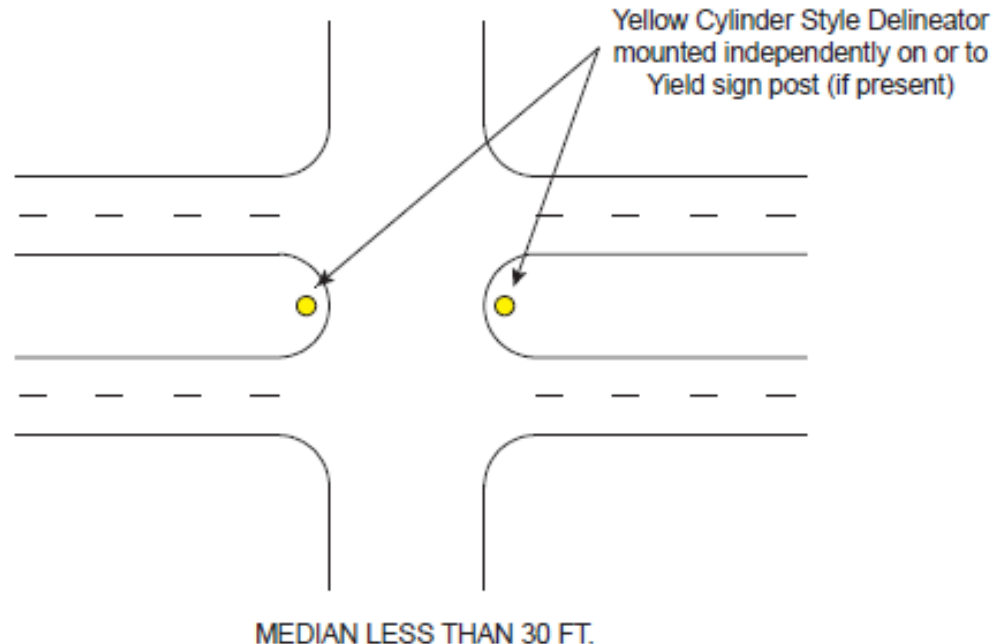


NOTES:

- ① F. & I.
- ② INPLACE
- ③ SALVAGE
- ④ REMOVE
- ⑤ REMOVE SIGN TYPE C
- ⑥ INSTALL

Signing Plan Assembly Steps

- Show appropriate delineation and markers
 - See [TEM](#) Chapter 6 for details
 - A note may be used to indicate standard delineation at standard exit ramp/loops
 - See sample Signing plans.



Signing Plan Assembly Steps

- Organize roadway into plan sheets
 - Begin with mainline roadway from start to finish of the project.
 - Stationing generally increasing from left to right
 - Interchange/intersections follow mainline roadway
 - Label all roadways, cross streets and bridges
 - Place “north” arrow and scale on all sheets
 - Eliminate all unnecessary elements in the file

When all the sign panels, delineators and markers are placed on the roadway layouts, with labels and notes, and the roadway layouts are organized into plan sheets, the plan is considered 60% complete. It is ready for initial review. Print outs of these roadway layouts, and Type A, D, EA, EO and OH panel designs should be submitted to MnDOT for review.

Signing Plan Assembly Steps

- Utilities: Compile a list of the utility companies within the project limits for inclusion in the plan

NOTE: Follow Utility Manual processes

GENERAL NOTES:

- NO UTILITIES WILL BE AFFECTED BY WORK ON THIS PROJECT.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASPE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

UTILITIES

THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES WITHIN THE PROJECT LIMITS

CENTERPOINT ENERGY
MN/DOT
MINNESOTA POWER
QWEST CORPORATION
US CABLE
XCEL ENERGY

(THIS IS JUST AN EXAMPLE OF HOW TO LIST UTILITY COMPANIES)

DISTRICT #: METRO
PROJECT NAME: UTILITIES
PLAN & PLOTTING: P:\PROJECTS\2017\05\18\2017_05_18_UTILITIES.dwg

P:\PROJECTS\2017\05\18\2017_05_18_UTILITIES.dwg

Signing Plan Assembly Steps

- Design Type A and OH sign structures following the cross section format in the sample plan (Freeways Class)
- Create estimated quantities tabulation and appropriate data boxes for each sign type and the work being done to the sign
 - Master Tabs and Sample Plan

Documents, checklists and worksheets

- [Sign Plan Assembly Steps](#) (PDF)
- [Standard Charts/Tabulations for use Construction Signing Plans - 2014 Spec Book](#) (XLS)
- [Standard Charts/Tabulations for use Construction Signing Plans - 2016 Spec Book](#) (XLS)
- [Type OH Signs - Interim Design B Structure Computation Sheet](#) (PDF)
- [Type OH Signs - Interim Design B Structure Computation Sheet - NO WALKWAY](#) (PDF)
- [Type A Signs - Post Spacing Chart](#) (PDF)
- [Type A Signs - Post Selection Chart](#) (PDF)
- [Type A Sign Post Dimensions](#) (PDF)
- [Type EA and EO Post Spacing Chart](#) (PDF)

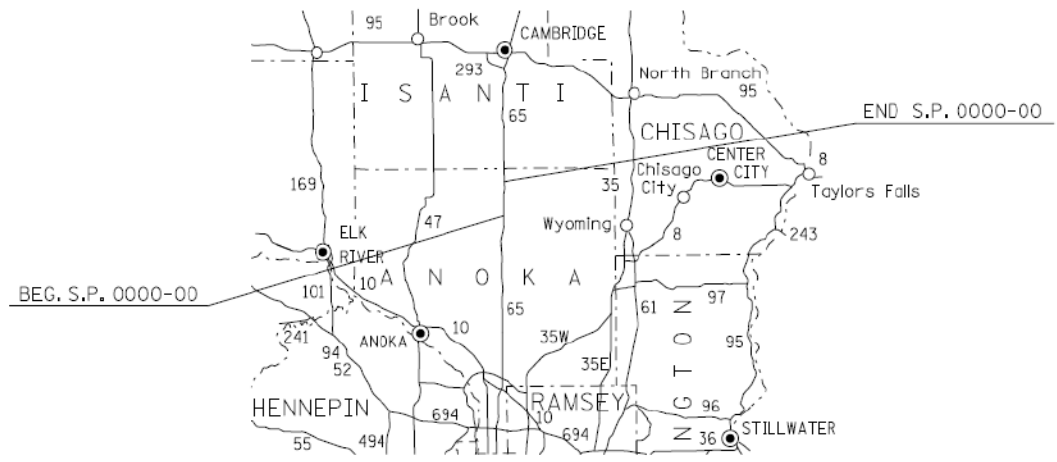
Signing Plan Assembly Steps

- Assemble all necessary structural and detail sheets
- Complete the title sheet (if signing plan is not part of a larger construction project)
- Assemble all plan sheets in their proper order (see sample plan)
- Number all plan sheets
- Verify all cross sheet referencing in the plan

Title Sheet

Plan Description & Location

MINNESOTA DEPARTMENT OF TRANSPORTATION
 CONSTRUCTION PLAN FOR SIGN REPLACEMENT
 LOCATED ON I.H. 65, 600' SO. OF 209TH AVE., N.E. TO 3/4 MILE NORTH OF 221ST AVE., N.E.



SCALE
 INDEX MAP 10 MILES

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY



FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL
 STATE PROJ. NO. _____ CHARGE IDENTIFIER _____
 _____ 0000-00 _____

FED. PROJ. NO. 0000-00

GOVERNING SPECIFICATIONS
 THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION
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8-15	ROADWAY LAYOUTS
16-18	SIGN PANEL LAYOUTS
19-20	PLACEMENT DETAILS
21-24	STRUCTURAL DETAILS

THIS PLAN CONTAINS 24 SHEETS

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: B. GOLDBERG LICENSE # 1984
 DATE: _____ SIGNATURE: _____
 DESIGN SQUAD: G. SCHWARTZ, R. SMITH, A. COGAN

RECOMMENDED FOR APPROVAL _____ 20
 DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL _____ 20
 DISTRICT TRAFFIC ENGINEER

RECOMMENDED FOR APPROVAL _____ 20
 STATE PRELIMINARY ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL _____ 20
 DIRECTOR, LAND MANAGEMENT

APPROVED _____ 20
 STATE DESIGN ENGINEER

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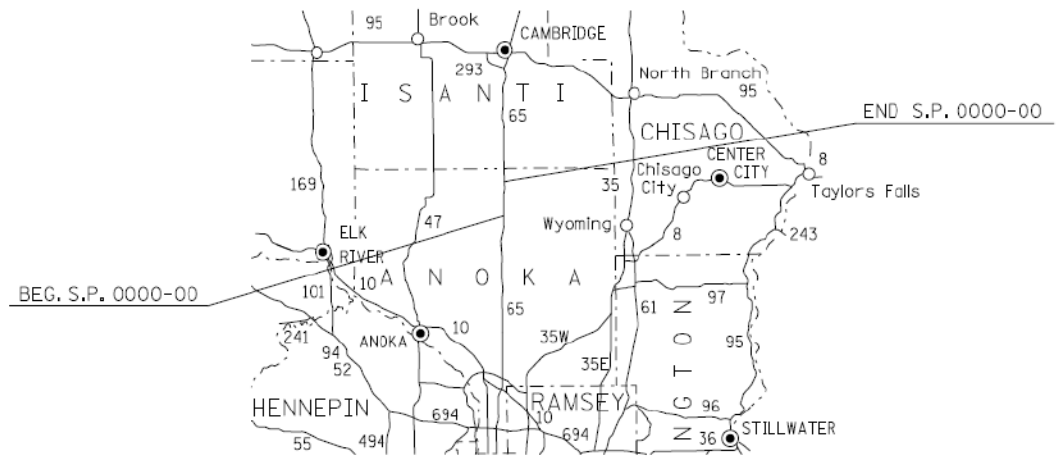


Title Sheet

Governing Specs & Index of Sheets

MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR SIGN REPLACEMENT
 LOCATED ON I.H. 65, 600' SO. OF 209TH AVE., N.E. TO 3/4 MILE NORTH OF 221ST AVE., N.E.



SCALE
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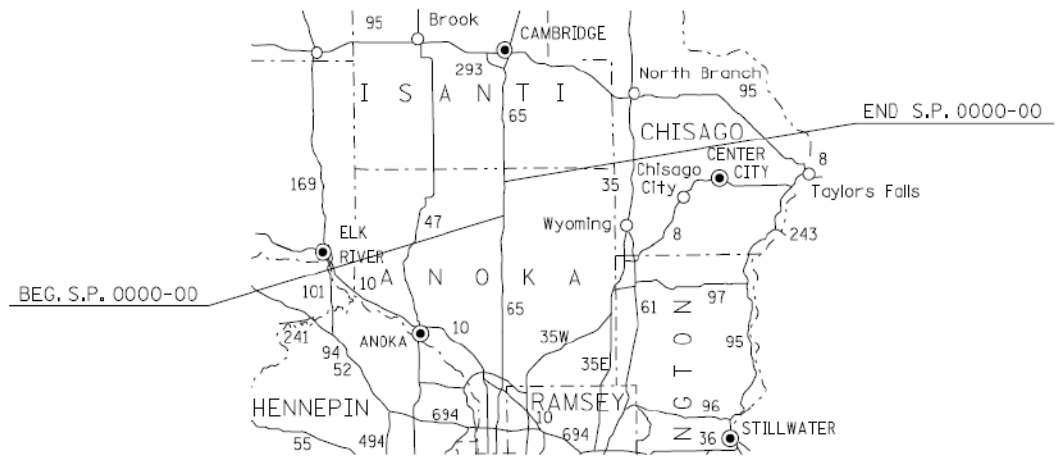


Title Sheet

Project Numbers

MINNESOTA DEPARTMENT OF TRANSPORTATION

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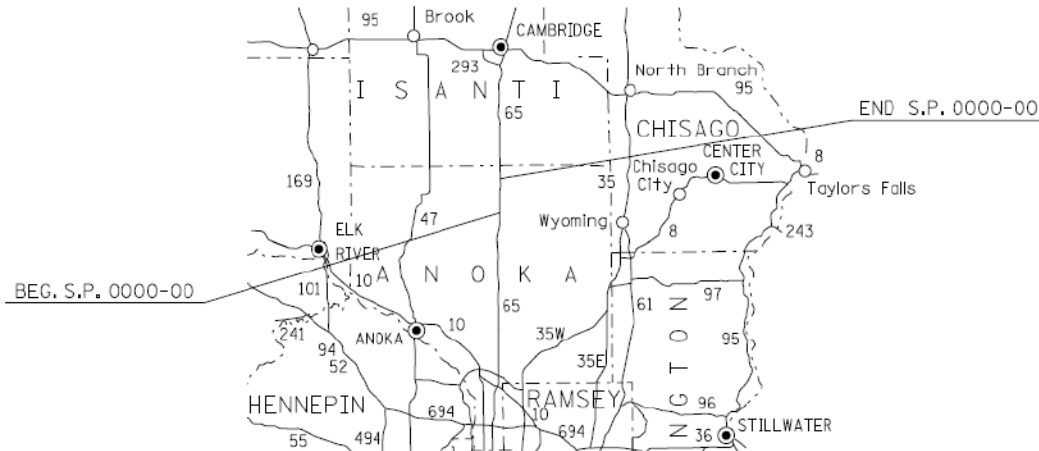


Title Sheet

Plan Approvals/Certification

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SCALE
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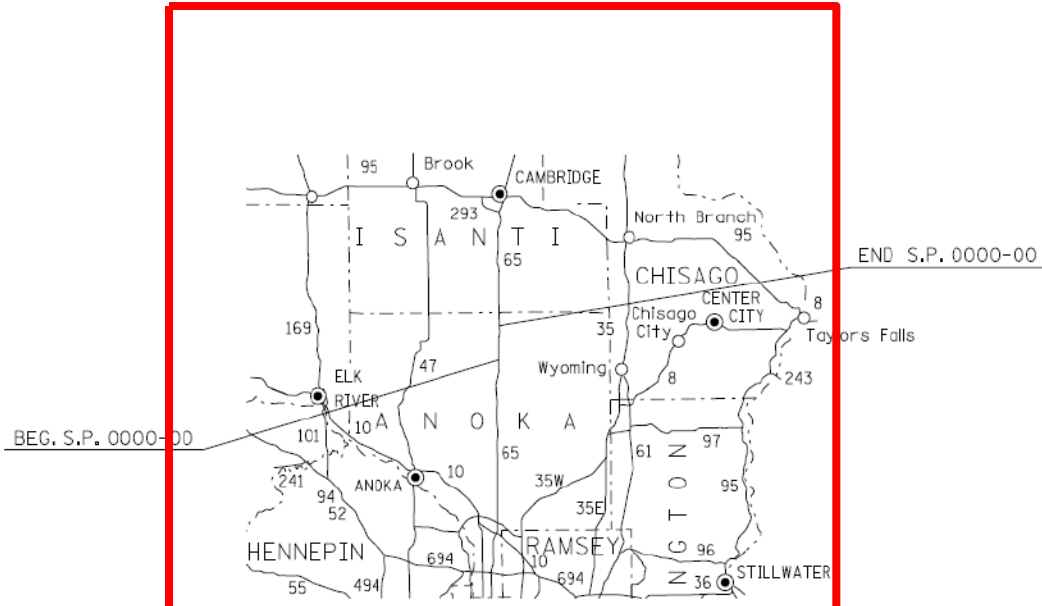
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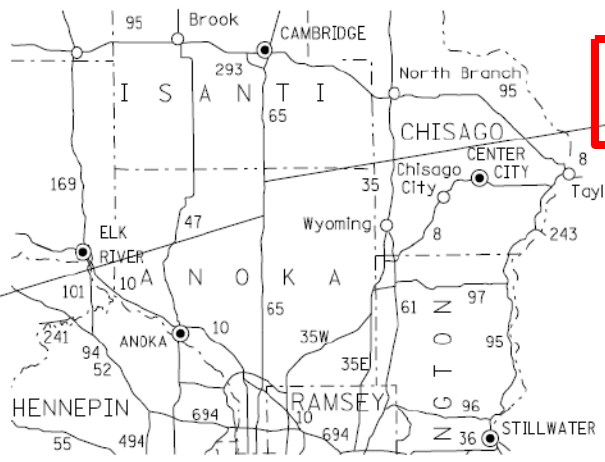


Title Sheet

Begin/End Stations

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BEG. S.P. 0000-00

END S.P. 0000-00

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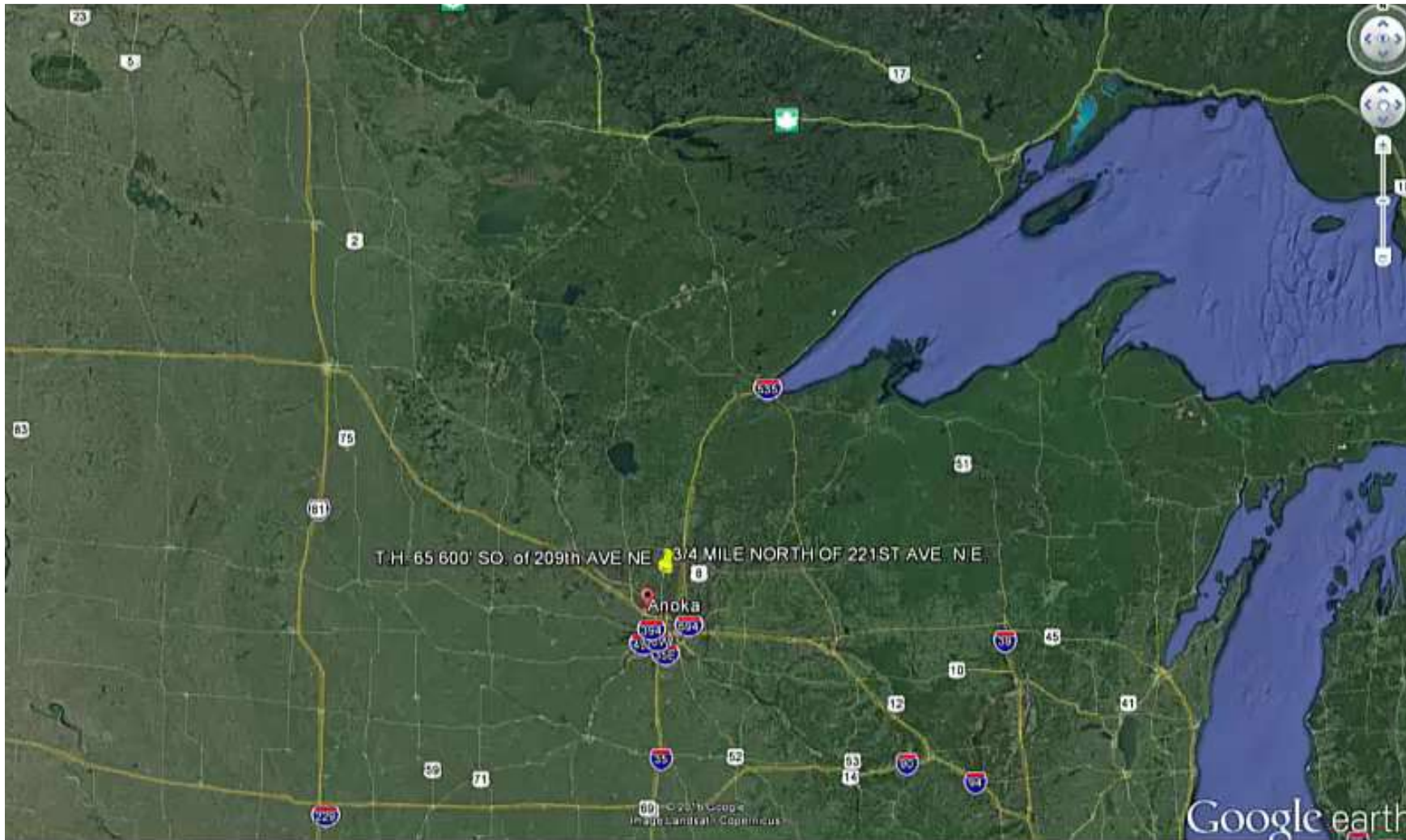
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Sample Plan

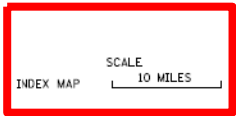
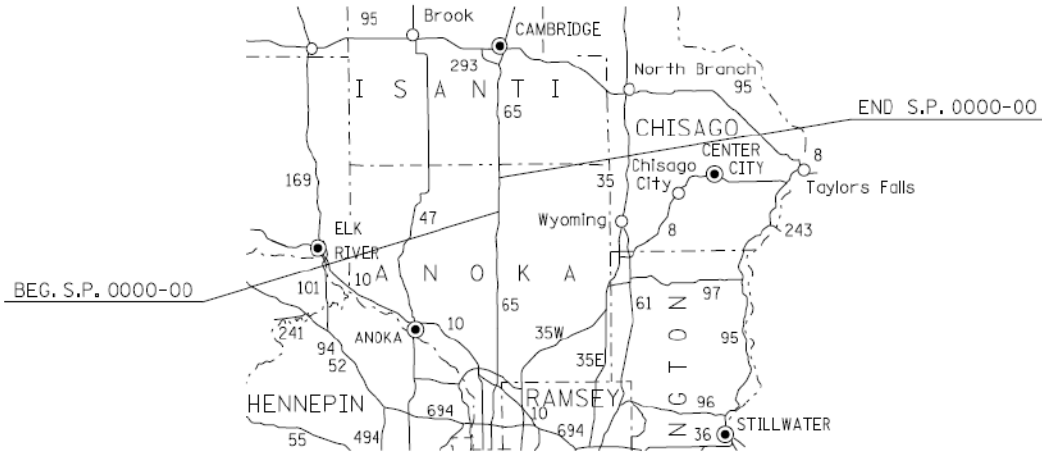


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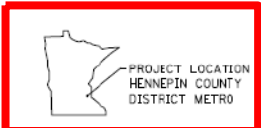
Project Location Plan & Map Scales

MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR SIGN REPLACEMENT
 LOCATED ON I.H. 65, 600' SO. OF 209TH AVE., N.E. TO 3/4 MILE NORTH OF 221ST AVE., N.E.



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DESIGN SQUAD G. SCHWARTZ, R. SMITH, A. COGAN

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RECOMMENDED FOR APPROVAL _____ DISTRICT TRAFFIC ENGINEER _____

RECOMMENDED FOR APPROVAL _____ STATE PRELIMINARY ENGINEER _____

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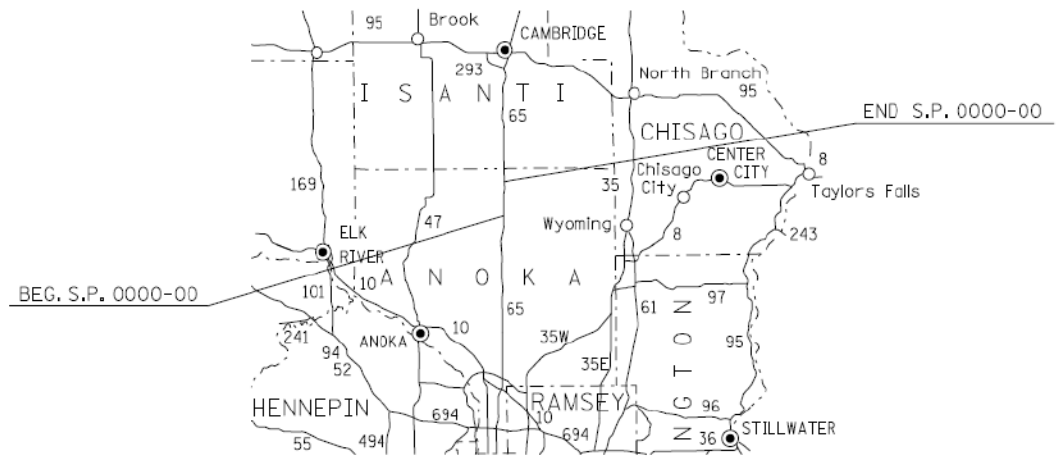
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Title Sheet

Plan Revisions Table

MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR SIGN REPLACEMENT
 LOCATED ON I.H. 65, 600' SO. OF 209TH AVE., N.E. TO 3/4 MILE NORTH OF 221ST AVE., N.E.



SCALE
 INDEX MAP 10 MILES

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RECOMMENDED FOR APPROVAL _____ DISTRICT TRANSPORTATION ENGINEER 20

RECOMMENDED FOR APPROVAL _____ DISTRICT TRAFFIC ENGINEER 20

RECOMMENDED FOR APPROVAL _____ STATE PRELIEUTENANT ENGINEER 20

OFFICE OF LAND MANAGEMENT APPROVAL _____ DISTRICT LAND MANAGEMENT 20

APPROVED _____ STATE DESIGN ENGINEER 20

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE 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: _____ LICENSE # _____
 DATE: _____ SIGNATURE: _____



Estimated Quantities

List of Pay Items

Item No.:	Item:	Unit:
2564.511	Concrete Footings Type ___	cubic yard [cubic meter]
2564.513	Median Barrier Footing	each
2564.515	Sign Support	each
2564.518	Overhead Sign Structure Repair	hour
2564.522	Structural Steel - (Specify Item & Use)	pound [kilogram]
2564.524	Modify Post	each
2564.531	Sign Panels Type ___	square foot [square meter]
2564.533	Furnish Sign Panels Type ___	square foot [square meter]
2564.534	Saw Sign Panels Type ___	linear foot [meter]
2564.535	Sign Panel Overlay Type ___	square foot [square meter]
2564.536	Install Sign Panel Type ___	each
2564.537	Install Sign Type ___	each
2564.539	Overhead Sign Identification Plate	each
2564.539	Lighting System Identification Plate	each
2564.540	Extend Walkway Support	each
2564.541	Friction Fuse	each
2564.542	Keeper Plate	each
2564.550	Declinator, Type ___	each
2564.551	Reference Location Sign	each
2564.552	Object Marker Type ___	each
2564.553	Bridge Number Marker X4-12A	each

STATEMENT OF ESTIMATED QUANTITIES						
TAB	SHEET NO	ITEM NO	ITEM	UNIT	TOTAL SIGNING QUANTITIES	
		2011.601	AS BUILT	LUMP SUM	1	
		2021.501	MOBILIZATION	LUMP SUM	1	
		2104.509	REMOVE MARKER	EACH	6	
		2104.509	REMOVE SIGN TYPE C	EACH	59	
D	5	2104.509	REMOVE SIGN TYPE D	EACH	16	
B	3	2104.523	SALVAGE SIGN TYPE C	EACH	2	
E	5	2104.523	SALVAGE SIGN TYPE D	EACH	2	
		2563.601	TRAFFIC CONTROL	LUMP SUM	1	
A	3	2564.531	SIGN PANELS TYPE C	SQ FT	791	
C	4	2564.531	SIGN PANELS TYPE D	SQ FT	573	
H	6	2564.531	SIGN PANELS TYPE OVERLAY	SQ FT	32	
B	3	2564.537	INSTALL SIGN TYPE C	EACH	2	
E	5	2564.537	INSTALL SIGN TYPE D	EACH	2	
G	6	2564.551	REFERENCE LOCATION SIGN	EACH	6	
F	6	2564.552	OBJECT MARKER TYPE X4-2	EACH	2	

For list of items, see Spec Book

Estimated Quantities

STATEMENT OF ESTIMATED QUANTITIES						
TAB	SHEET NO	ITEM NO	ITEM	UNIT	TOTAL SIGNING QUANTITIES	
		2011.601	AS BUILT	LUMP SU		1
		2021.501	MOBILIZATION	LUMP SU		1
		2104.509	REMOVE MARKER	EACH		6
		2104.509	REMOVE SIGN TYPE C	EACH		59
D	5	2104.509	REMOVE SIGN TYPE D	EACH		16
B	3	2104.523	SALVAGE SIGN TYPE C	EACH		2
E	5	2104.523	SALVAGE SIGN TYPE D	EACH		2
		2563.601	TRAFFIC CONTROL	LUMP SU		1
A	3	2564.531	SIGN PANELS TYPE C	SQ FT		791
C	4	2564.531	SIGN PANELS TYPE D	SQ FT		573
H	6	2564.531	SIGN PANELS TYPE OVERLAY	SQ FT		32
B	3	2564.537	INSTALL SIGN TYPE C	EACH		2
E	5	2564.537	INSTALL SIGN TYPE D	EACH		2
G	6	2564.551	REFERENCE LOCATION SIGN	EACH		6
F	6	2564.552	OBJECT MARKER TYPE X4-2	EACH		2



Type C Sign Data Sheet Chart A and Chart B

Chart A for signs to be furnished and installed

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	(2)
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	(2)
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	(2)
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	(2)
						54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
						54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	(2)
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	(2)
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3ma	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1ma	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	(2)
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	(3)
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
TOTAL							791.00				

- SPECIFIC NOTES:**
- (1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE) SEE SHEET NO. 22 FOR TYPICAL MOUNTING.
 - (2) FOR PUNCHING AND MOUNTING DETAILS SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL, PAGE 110.
 - (3) MOUNT BACK TO BACK.
 - (4) MOUNT BACK TO BACK WITH ONEWAY ABOVE YIELD.
 - (5) MOUNT IN CONCRETE, SEE SHEET 23
 - (6) MOUNT ON SIGNAL POLE, SEE SHEET 24.

- GENERAL NOTES:**
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
 2. SEE SHEET 19 FOR SIGN PLACEMENT DETAILS.
 3. SEE SHEETS 21 TO 22 FOR STRUCTURAL DETAILS.
 4. SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE C SIGN PANELS.

SALVAGE & INSTALL SIGN TYPE C											B
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-201	2	2-U	1	16	7	60 x 36				ADOPT A HIGHWAY	
TOTAL											2

- SPECIFIC NOTES:**
- (1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE) SEE SHEET 22 FOR TYPICAL MOUNTING.
- GENERAL NOTES:**
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
 2. SEE SHEET 19 FOR SIGN PLACEMENT DETAILS.
 3. SEE SHEETS 21 TO 22 FOR STRUCTURAL DETAILS.
 4. SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE C SIGN PANELS.

Chart B for signs to be salvaged and installed

Type C Sign Data Sheet Chart A

Sign Number

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1) FEET	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3md	SOUTH	(2)
C-12	2				7	36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
C-13	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						30 x 15	3.13	6.25	M3-1md	NORTH	(2)
C-14	2	2-U	1	17	7	36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
C-15	2	2-U	1	19	7	36 x 36	9.00	18.00	R1-1	STOP	(2)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	
C-17	2	1-ST		16	7	36 x 36 x 36	3.90	7.80	R1-2	YIELD	(4)
						36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	
TOTAL								791.00			

Order in accordance with the Standard Signs Summary

- Regulatory
- Warning
- Route Markers & Auxiliaries

Type C Sign Data Sheet Chart A

Quantity

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1) FEET	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE	AREA	TOTAL AREA			
						INCH	SQ FT	SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3ma	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1ma	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
						36 x 36	9.00	18.00	R1-1	STOP	
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	
TOTAL								791.00			

Type C Sign Data Sheet Chart A

Posts

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1) FEET	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE		TOTAL AREA			
						INCH	SQ FT	SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3md	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1md	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
						36 x 36	9.00	18.00	R1-1	STOP	
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
TOTAL								791.00			

Number of Posts, Type, and Knee Brace Quantity
 – TEM Charts 6.2
 Length
 – Post Length Determination Sheet

Type C Sign Data Sheet

Chart A

Mounting Height

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3ma	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1ma	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
						36 x 36	9.00	18.00	R1-1	STOP	
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	
TOTAL								791.00			

Type C Sign Data Sheet

Chart A

Panel Summary

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1) FEET	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE	AREA	TOTAL AREA			
						INCH	SQ FT	SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
						54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
C-2	4	2-U	1	17	7	36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3ma	SOUTH	(2)
(6) C-12	2				7	36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1ma	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
C-15	2	2-U	1	19	7	36 x 36	9.00	18.00	R1-1	STOP	(2)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
(5) C-17	2	1-ST		16	7	36 x 36 x 36	3.90	7.80	R1-2	YIELD	(4)
						36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	
TOTAL								791.00			

Size specified in the Standard Signs Summary
STOP signs specified in TEM 6-5.12

Type C Sign Data Sheet

Chart A

Code Number, Panel Legend

SIGN PANELS TYPE C										A	
SIGN NO	QTY	POSTS			MTG HT (1) FEET	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE	AREA	TOTAL AREA			
						INCH	SQ FT	SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
						54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3ma	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1ma	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
						36 x 36	9.00	18.00	R1-1	STOP	
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	
TOTAL								791.00			

Code specified in the Standard Signs Summary

Type C Sign Data Sheet Chart A

Specific Notes

SIGN PANELS TYPE C										A	
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
						54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
						54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3ma	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1ma	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2) (3)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	(2)
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
TOTAL								791.00			

- SPECIFIC NOTES:**
- (1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE) SEE SHEET NO. 22 FOR TYPICAL MOUNTING.
 - (2) FOR PUNCHING AND MOUNTING DETAILS SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL, PAGE 110.
 - (3) MOUNT BACK TO BACK.
 - (4) MOUNT BACK TO BACK WITH ONEWAY ABOVE YIELD.
 - (5) MOUNT IN CONCRETE, SEE SHEET 23
 - (6) MOUNT ON SIGNAL POLE, SEE SHEET 24.

Type C Sign Data Sheet Chart A

General Notes

SIGN PANELS TYPE C											A
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-3	7	2-U	1	16	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-4	6	2-U		14	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	
C-7	4	2-U	1	16	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(2)
						36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-8	3	2-U		14	7	54 x 18	6.75	20.25	R6-1R	ONE WAY RIGHT	(2)
C-9	2	2-U	1	17	7	48 x 48	16.00	32.00	W3-3	SIGNAL AHEAD	
C-10	4	2-U	1	18	7	48 x 60	20.00	80.00	R2-1	SPEED LIMIT 65	
C-11	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-3mc	SOUTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
(6) C-12	2				7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2)
C-13	2	2-U	1	17	7	30 x 15	3.13	6.25	M3-1mc	NORTH	(2)
						36 x 36	9.00	18.00	W13-1P	MINNESOTA 65	(2)
C-14	2	2-U	1	17	7	54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	
						36 x 36	9.00	18.00	R1-1	STOP	
C-15	2	2-U	1	19	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(2) (3)
						54 x 18	6.75	13.50	R6-1R	ONE WAY RIGHT	(2)
						36 x 36	9.00	18.00	R1-1	STOP	(2)
						30 x 24	5.00	10.00	R6-3	DIVIDED HIGHWAY	(2)
C-16	2	2-U	1	17	7	48 x 18	6.00	12.00	R6-1R	ONE WAY RIGHT	(4)
						36 x 36 x 36	3.90	7.80	R1-2	YIELD	
(5) C-17	2	1-ST		16	7	36 x 36	9.00	18.00	R5-1	DO NOT ENTER	
(5) C-18	2	1-ST		10	7	54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	(3)
						54 x 18	6.75	13.50	R6-1L	ONE WAY LEFT	
						TOTAL		791.00			

- GENERAL NOTES:**
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
 2. SEE SHEET 19 FOR SIGN PLACEMENT DETAILS.
 3. SEE SHEETS 21 TO 22 FOR STRUCTURAL DETAILS.
 4. SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE C SIGN PANELS.

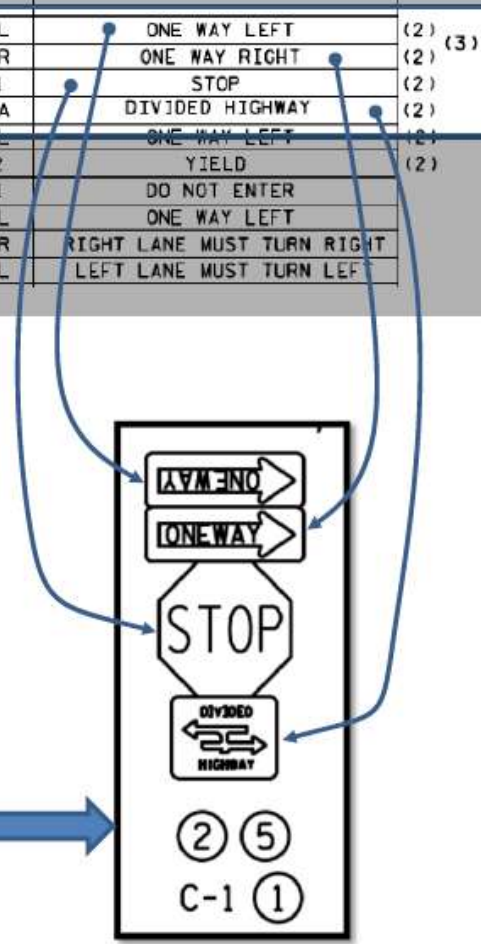
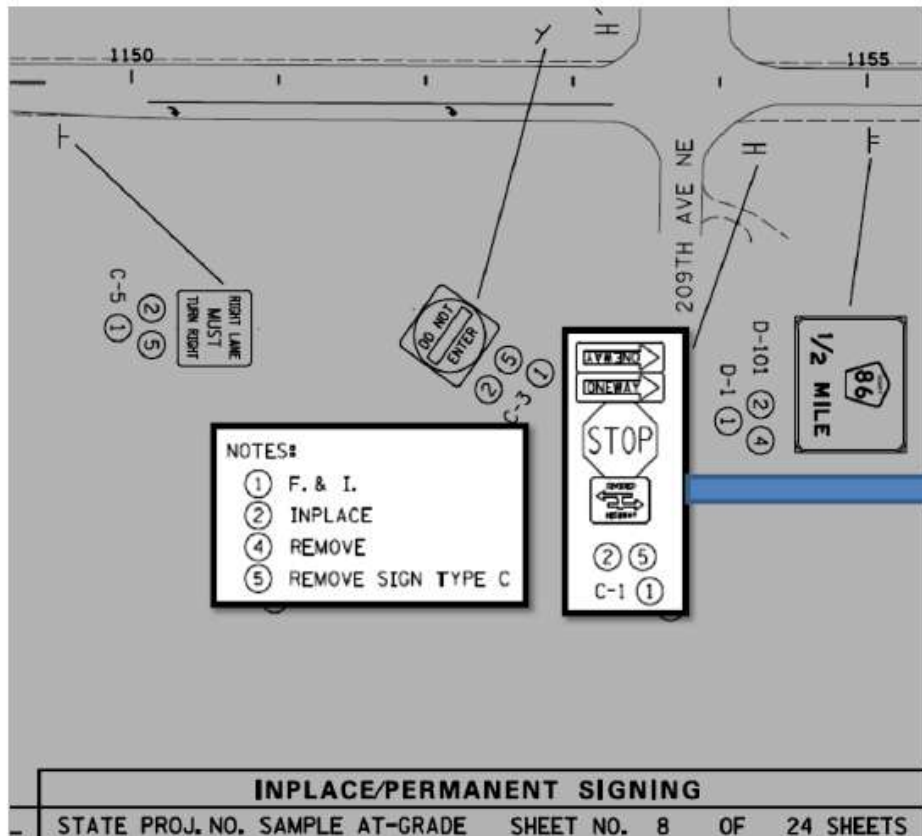
Type C Sign Data Sheet

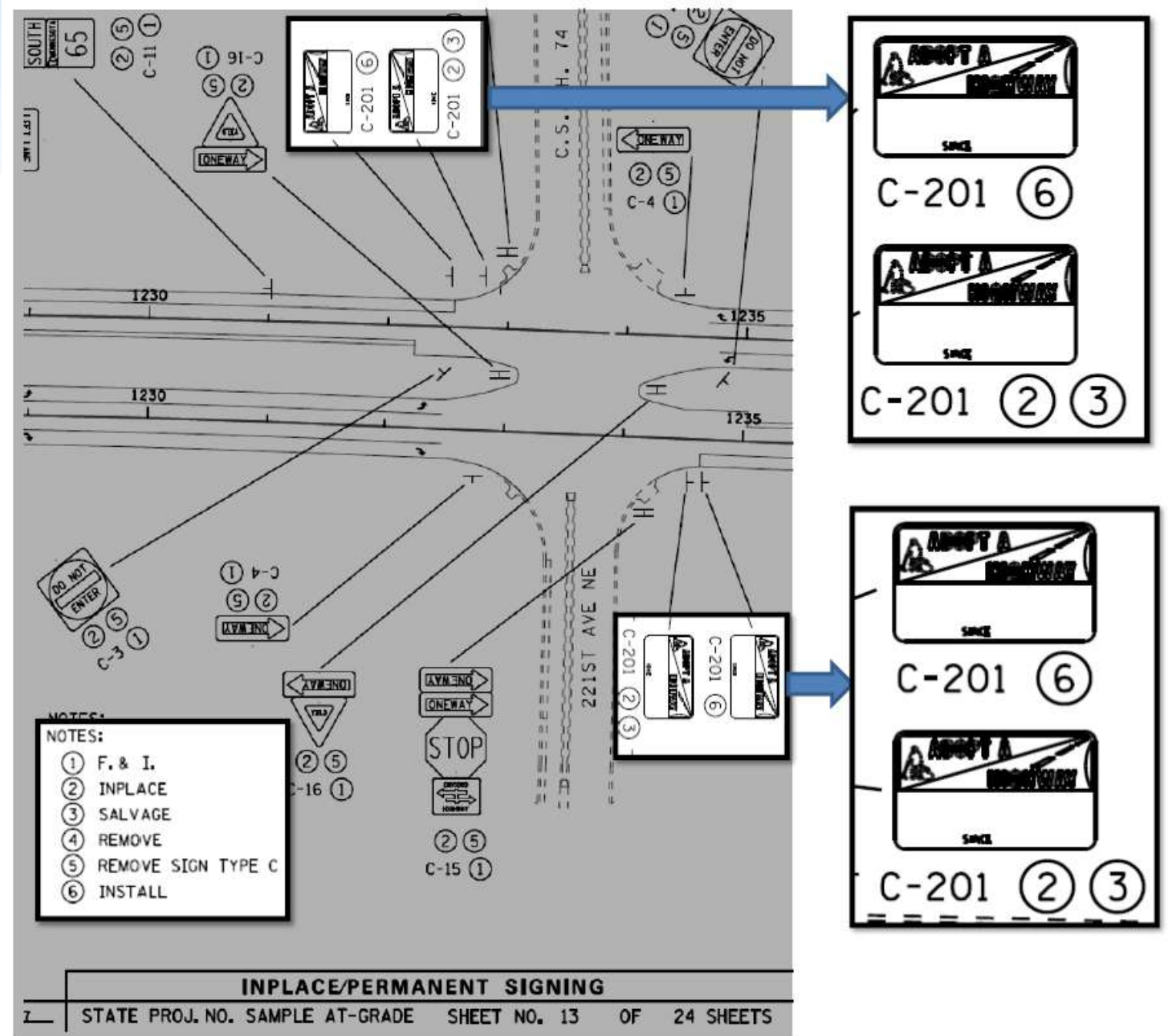
Chart B

SALVAGE & INSTALL SIGN TYPE C							B
SIGN NO	QTY	POSTS			MTG HT (1) FEET	PANEL	PANEL LEGEND
		NO & TYPE	KNEE BRACES QTY	LENGTH		SIZE	
EACH	FEET			INCH			
C-201	2	2-U	1	16	7	60 x 36	ADOPT A HIGHWAY
TOTAL	2						

Same information as Chart A, however,
 –Chart B is for Signs to be salvaged and installed

SIGN PANELS TYPE C										A	
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	LENGTH FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT			
C-1	4	2-U	1	19	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
						54 x 18	6.75	27.00	R6-1R	ONE WAY RIGHT	(3)
						36 x 36	9.00	36.00	R1-1	STOP	(2)
						30 x 24	5.00	20.00	R6-3A	DIVIDED HIGHWAY	(2)
C-2	4	2-U	1	17	7	54 x 18	6.75	27.00	R6-1L	ONE WAY LEFT	(2)
C-3	7	2-U	1	16	7	36 x 36 x 36	3.90	15.60	R1-2	YIELD	(2)
C-4	6	2-U	1	14	7	36 x 36	9.00	63.00	R5-1	DO NOT ENTER	
C-5	9	2-U	1	15	7	54 x 18	6.75	40.50	R6-1L	ONE WAY LEFT	
C-5	9	2-U	1	15	7	30 x 30	6.25	56.25	R3-7R	RIGHT LANE MUST TURN RIGHT	
C-6	8	2-U	1	15	7	30 x 30	6.25	50.00	R3-7L	LEFT LANE MUST TURN LEFT	





Type C Sign Data Sheet

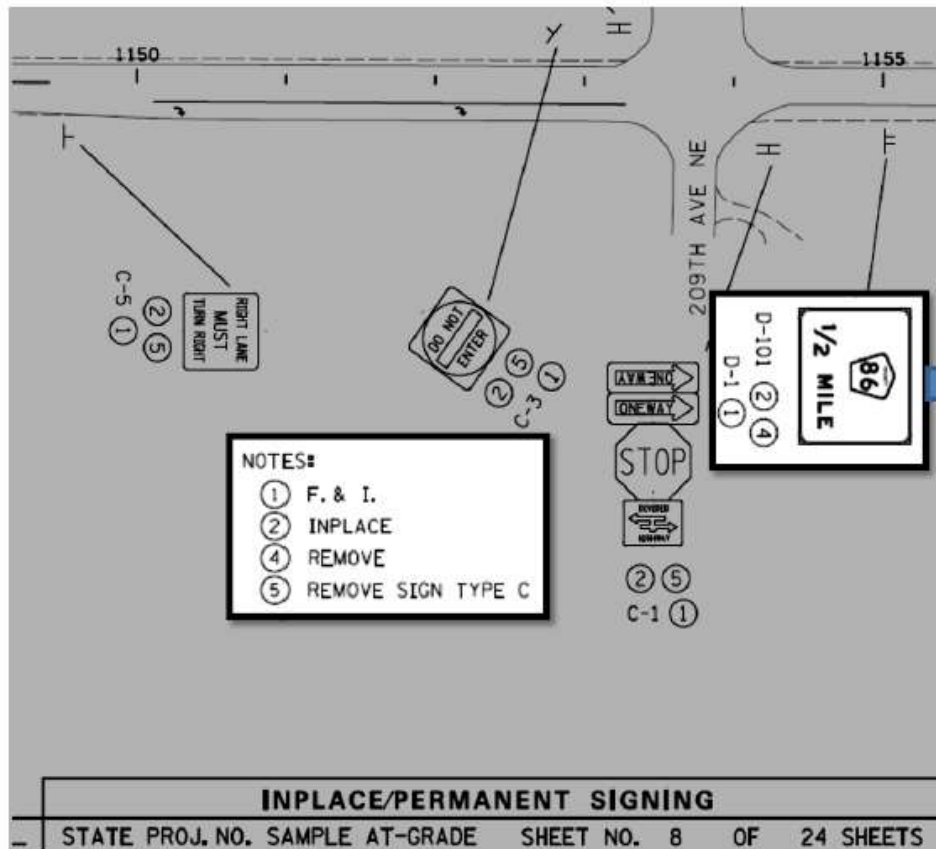
Charts C

SIGN PANELS TYPE D										C
SIGN NO.	QUANT.	POSTS				MTG HT. (1) (FT.)	PANEL			PANEL LEGEND
		NO. & TYPE	KNEE BRACES QUANT.	LEN. (FT.)	SPACING (IN.)		SIZE (IN.)	AREA (SQ. FT.)	TOTAL AREA (SQ. FT.)	
D-1	2	2-U	2	18	42	7	72 x 60	30.00	60.00	
D-2	1	2-U	2	17	54	7	84 x 48	28.00	28.00	
D-3	2	2-U	2	17	54	7	84 x 48	28.00	56.00	
D-4	1	2-U	2	18	30	7	48 x 66	22.00	22.00	
D-5	1	2-U	2	18	30	7	48 x 66	22.00	22.00	
D-6	1	2-U	2	17	54	7	84 x 48	28.00	28.00	
D-7	2	3-U	3	19	45	7	102 x 78	55.25	110.50	

Post Spacing

- Punch Codes in Standard Signs Manual or
- TEM Chart 6.4
- Panel Legend (graphic)
- Details on later sheet







SIGN PANELS TYPE D										C
SIGN NO.	QUANT.	POSTS				MTG HT. (1) (FT.)	PANEL			PANEL LEGEND
		NO. & TYPE	KNEE BRACES QUANT.	LEN. (FT.)	SPACING (IN.)		SIZE (IN.)	AREA (SQ. FT.)	TOTAL AREA (SQ. FT.)	
D-1	2	2-U	2	18	42	7	72 x 60	30.00	60.00	
D-2	1	2-U	2	17	54	7	84 x 48	28.00	28.00	
D-3	2	2-U	2	17	54	7	84 x 48	28.00	56.00	
D-4	1	2-U	2	18	30	7	48 x 66	22.00	22.00	



Type D Sign Data Sheet

Chart D and E

REMOVE SIGN TYPE D						D
SIGN NO	QTY	POSTS		PANEL	PANEL LEGEND	
		NO & TYPE	KNEE BRACES QTY	SIZE (1)		
EACH	TYPE	QTY	INCH			

SALVAGE & INSTALL SIGN TYPE D								E
SIGN NO	QTY	POSTS				MTG HT (1)	PANEL	PANEL LEGEND
		NO & TYPE	KNEE BRACES QTY	SPACING	LENGTH		SIZE	
				INCH	FEET	FEET	INCH	
D-107	2	3-U	3	102 x 78				
D-108	1	2-U	2	102 x 48				
D-109	1	2-U	2	102 x 48				
D-110	1	2-U	2	102 x 48				
D-111	2	3-U	3	102 x 78				
D-112	1	2-U	2	102 x 48				
TOTAL	16							

(1) SIZES ARE APPROXIMATE

SPECIFIC NOTES:

(1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE) SEE SHEET 22 FOR TYPICAL MOUNTING.

GENERAL NOTES:

- POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
- SEE SHEETS 21 TO 22 FOR STRUCTURAL DETAILS.
- SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR TYPE D STRINGER AND PANEL JOINT DETAILS.

Chart E

SALVAGE & INSTALL SIGN TYPE D								E
SIGN NO	QTY	POSTS				MTG HT (1) FEET	PANEL SIZE INCH	PANEL LEGEND
		NO & TYPE	KNEE BRACES QTY	SPACING INCH	LENGTH FEET			
		EACH						
D-201	1	2-U	2	17	90	7	144 x 48	CITY HALL - COMMUNITY CENTER 1 MILE →
D-202	1	2-U	2	17	90	7	144 x 48	CITY HALL - COMMUNITY CENTER ← 1 MILE
TOTAL	2							

- NOTES:
- ① F. & L.
 - ② INPLACE
 - ③ SALVAGE
 - ④ REMOVE
 - ⑤ REMOVE SIGN TYPE C
 - ⑥ INSTALL

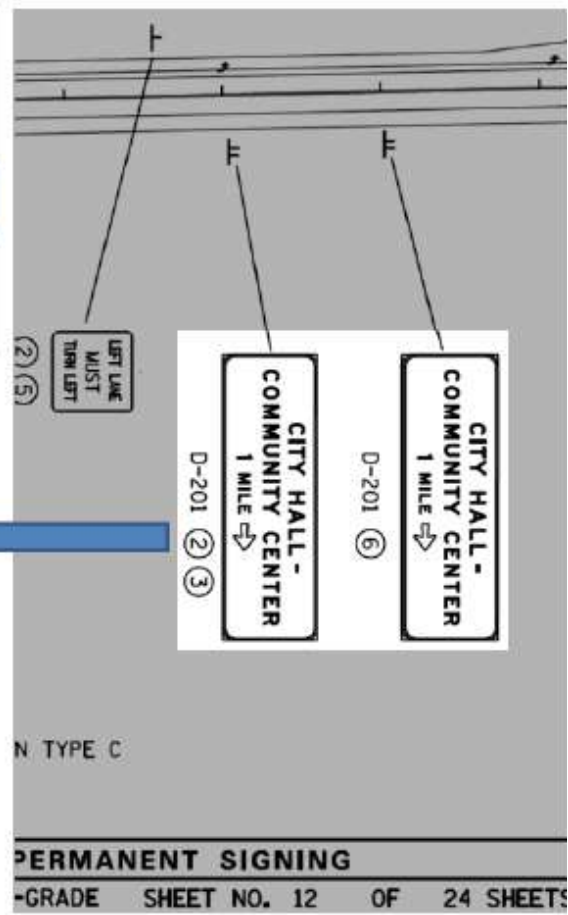
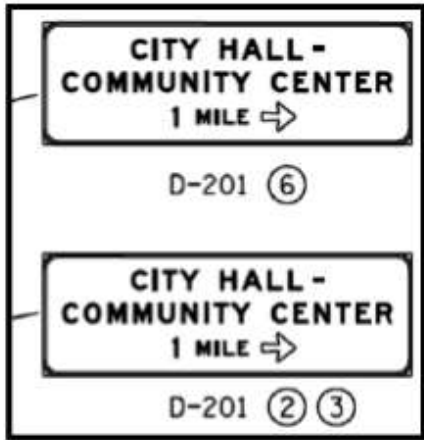


Chart F, G and H

OBJECT MARKER				F
CODE NO	SIZE INCH	COLOR	QUANTITY EACH	
(2) X4-2	18 x 18	YELLOW ON BLACK	2	
TOTAL QUANTITIES				
CODE NO	QUANTITY EACH			
X4-2	2			

- SPECIFIC NOTES:**
 (1) MOUNT ON 3LB/FT POST (MNDOT 3401).
 (2) MOUNTED IN CONCRETE.
- GENERAL NOTES:**
 1. FOR MARKER PLACEMENT, SEE SHEET NO. 20.
 2. SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR MARKER DETAIL.

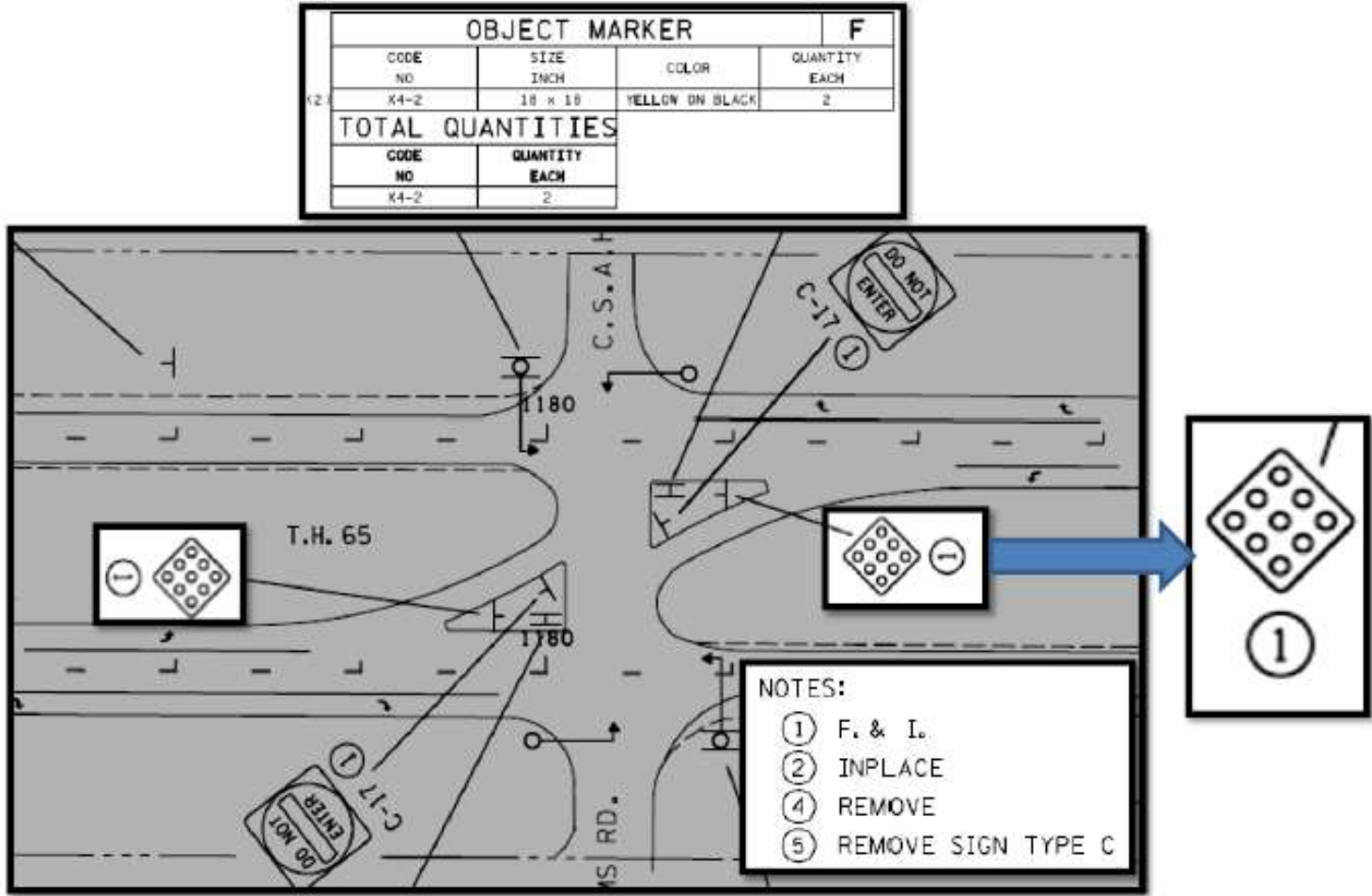
REFERENCE LOCATION SIGN (1)				G
CODE NO	QTY	SIZE	LEGEND	
	EACH	INCH		
D10-2	2	12 x 36	MILE 26	
D10-2	2	12 x 36	MILE 27	
D10-2	2	12 x 36	MILE 28	
TOTAL		6		

- SPECIFIC NOTES:**
 (1) MOUNT ON 3 LB/FT POST (MNDOT 3401).
- GENERAL NOTE:**
 1. SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR REFERENCE LOCATION SIGN DETAIL.
 2. FOR REFERENCE LOCATION SIGN PLACEMENT, SEE SHEET NO. 20.

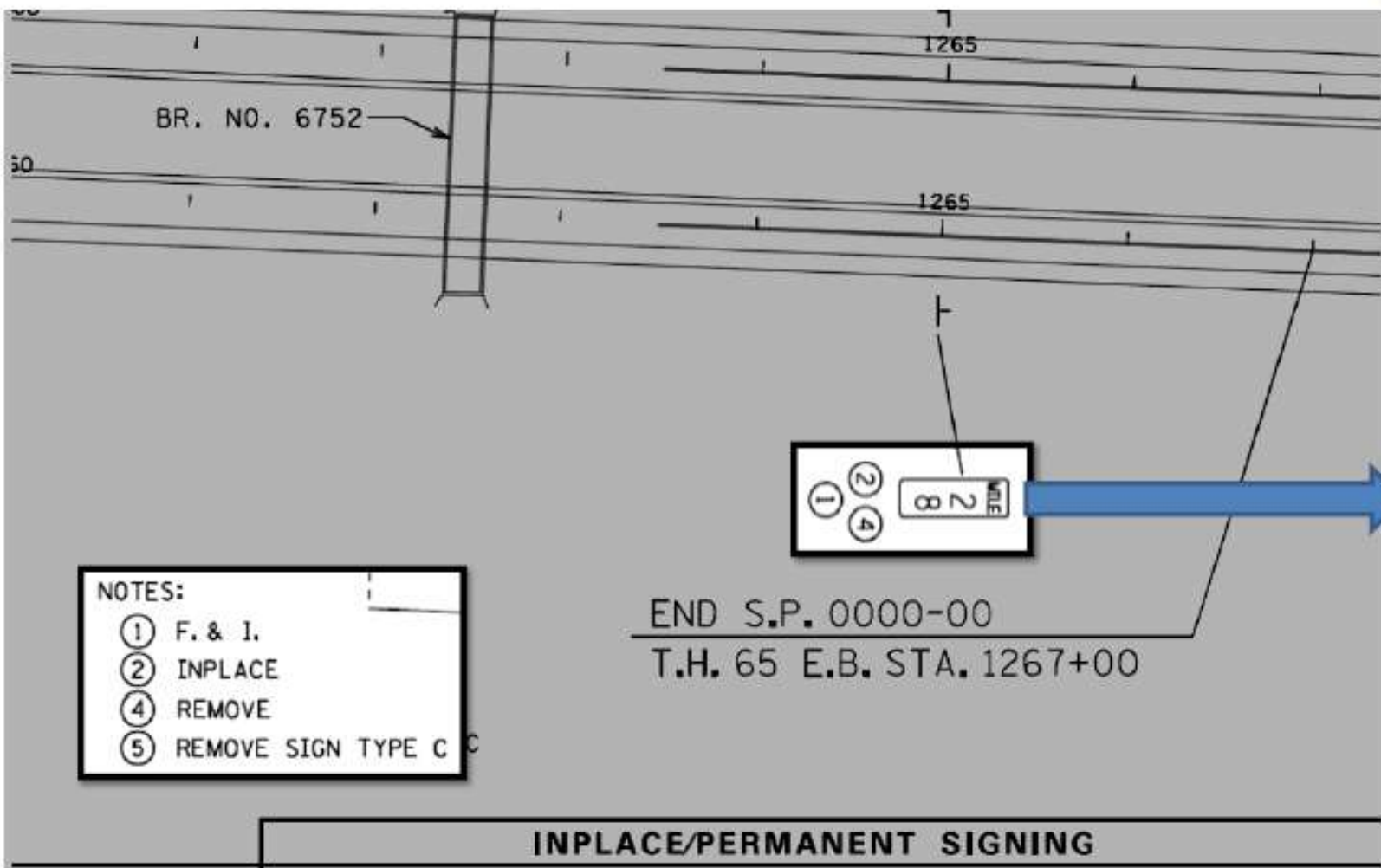
SIGN PANELS TYPE OVERLAY					H
CODE NO	QTY	SIZE	AREA	TOTAL	LEGEND
		INCH	SQ FT	SQ FT	
M1-6A	4	24 x 24	4.00	16.00	COUNTY 74
M1-6A	4	24 x 24	4.00	16.00	COUNTY 86
TOTAL				32.00	



Chart F



REFERENCE LOCATION SIGN (1)			G
CODE NO	QTY	SIZE	LEGEND
	EACH	INCH	
D10-2	2	12 x 36	MILE 26
D10-2	2	12 x 36	MILE 27
D10-2	2	12 x 36	MILE 28
TOTAL		b	



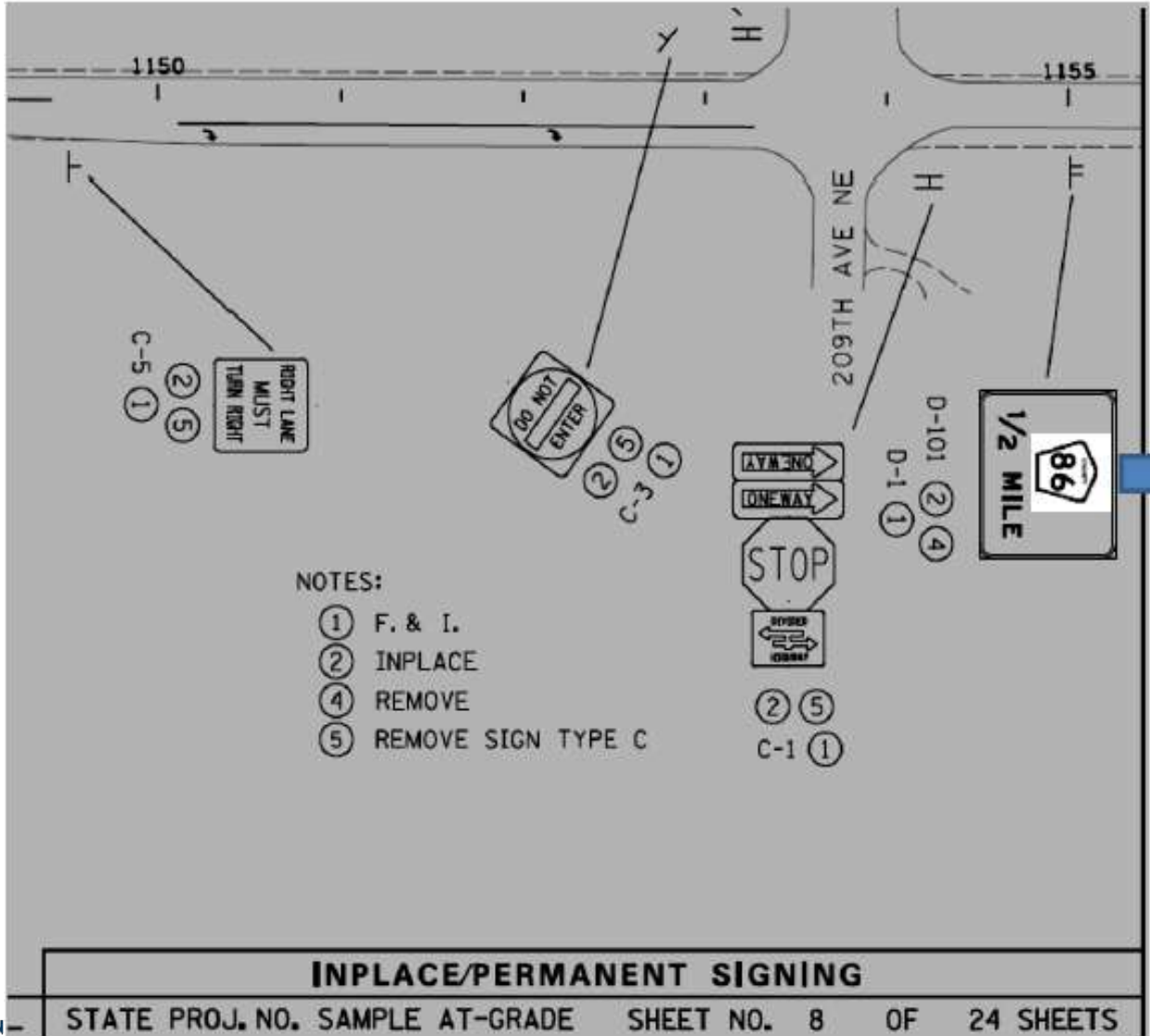
NOTES:

- ① F. & I.
- ② INPLACE
- ④ REMOVE
- ⑤ REMOVE SIGN TYPE C

INPLACE/PERMANENT SIGNING

DATE 5/18/2017 STATE PROJ. NO. SAMPLE AT-GRADE SHEET NO. 15 OF 24 SHEETS

SIGN PANELS TYPE OVERLAY					H
CODE NO	QTY	SIZE	AREA	TOTAL	LEGEND
		INCH	SQ FT	SQ FT	
M1-6A	4	24 x 24	4.00	16.00	COUNTY 74
M1-6A	4	24 x 24	4.00	16.00	COUNTY 86
TOTAL				32.00	



Utilities

**Follow the Utility
Manual Processes**

GENERAL NOTES:

- NO UTILITIES WILL BE AFFECTED BY WORK ON THIS PROJECT.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

UTILITIES

THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES WITHIN THE PROJECT LIMITS

CENTERPOINT ENERGY
MN/DOT
MINNESOTA POWER
QWEST CORPORATION
US CABLE
XCEL ENERGY

(THIS IS JUST AN EXAMPLE OF HOW TO LIST UTILITY COMPANIES)

Utilities

Affect on Utilities

GENERAL NOTES:

- NO UTILITIES WILL BE AFFECTED BY WORK ON THIS PROJECT.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

UTILITIES

THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES WITHIN THE PROJECT LIMITS

CENTERPOINT ENERGY
MN/DOT
MINNESOTA POWER
QWEST CORPORATION
US CABLE
XCEL ENERGY

(THIS IS JUST AN EXAMPLE OF HOW TO LIST UTILITY COMPANIES)

Utilities

Subsurface Utility Info

GENERAL NOTES:

- NO UTILITIES WILL BE AFFECTED BY WORK ON THIS PROJECT.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

UTILITIES

THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES WITHIN THE PROJECT LIMITS

CENTERPOINT ENERGY
MN/DOT
MINNESOTA POWER
QWEST CORPORATION
US CABLE
XCEL ENERGY

(THIS IS JUST AN EXAMPLE OF HOW TO LIST UTILITY COMPANIES)

Utilities

List of Utilities

GENERAL NOTES:

- NO UTILITIES WILL BE AFFECTED BY WORK ON THIS PROJECT.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

UTILITIES

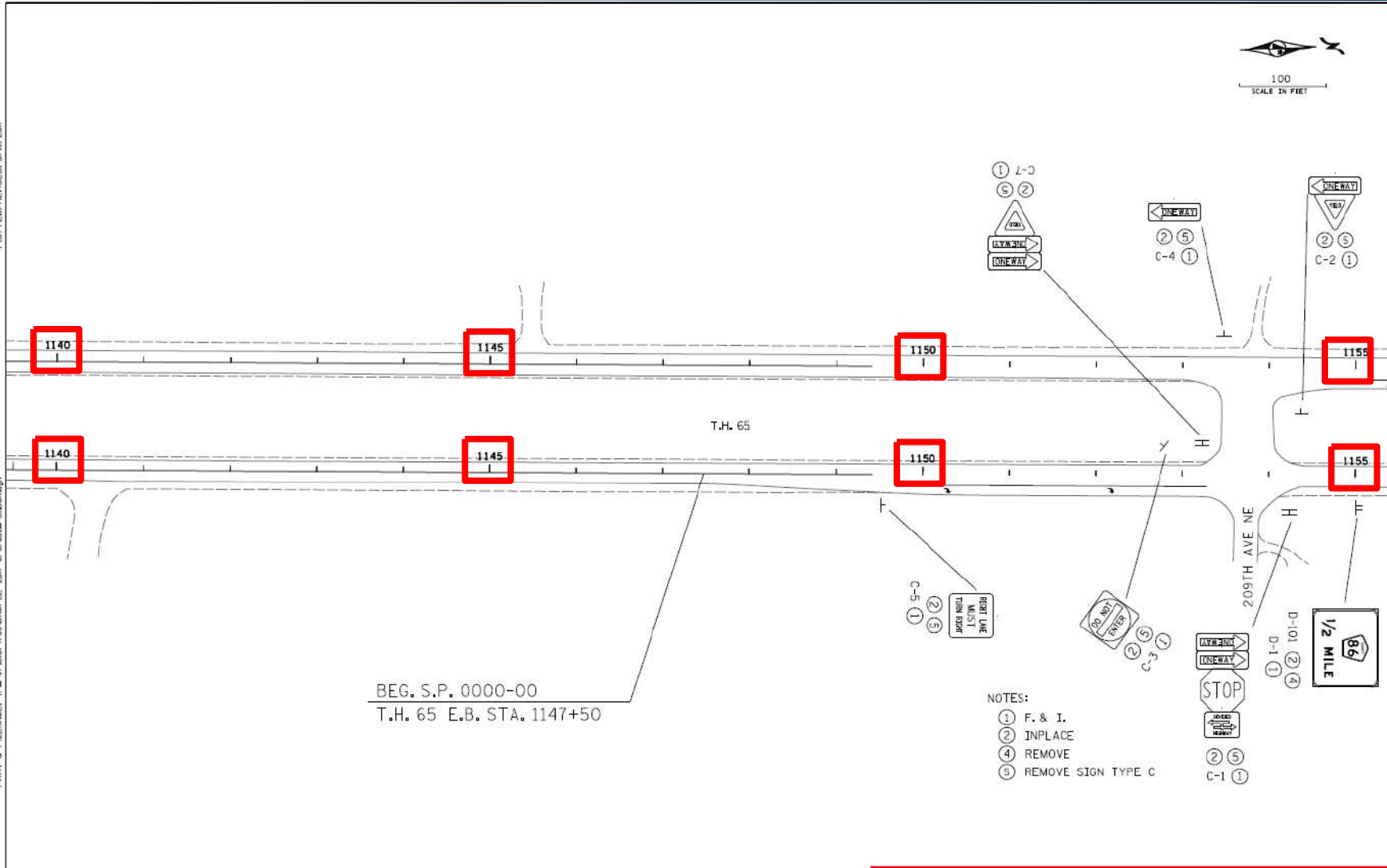
THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES WITHIN THE PROJECT LIMITS

CENTERPOINT ENERGY
MN/DOT
MINNESOTA POWER
QWEST CORPORATION
US CABLE
XCEL ENERGY

(THIS IS JUST AN EXAMPLE OF HOW TO LIST UTILITY COMPANIES)

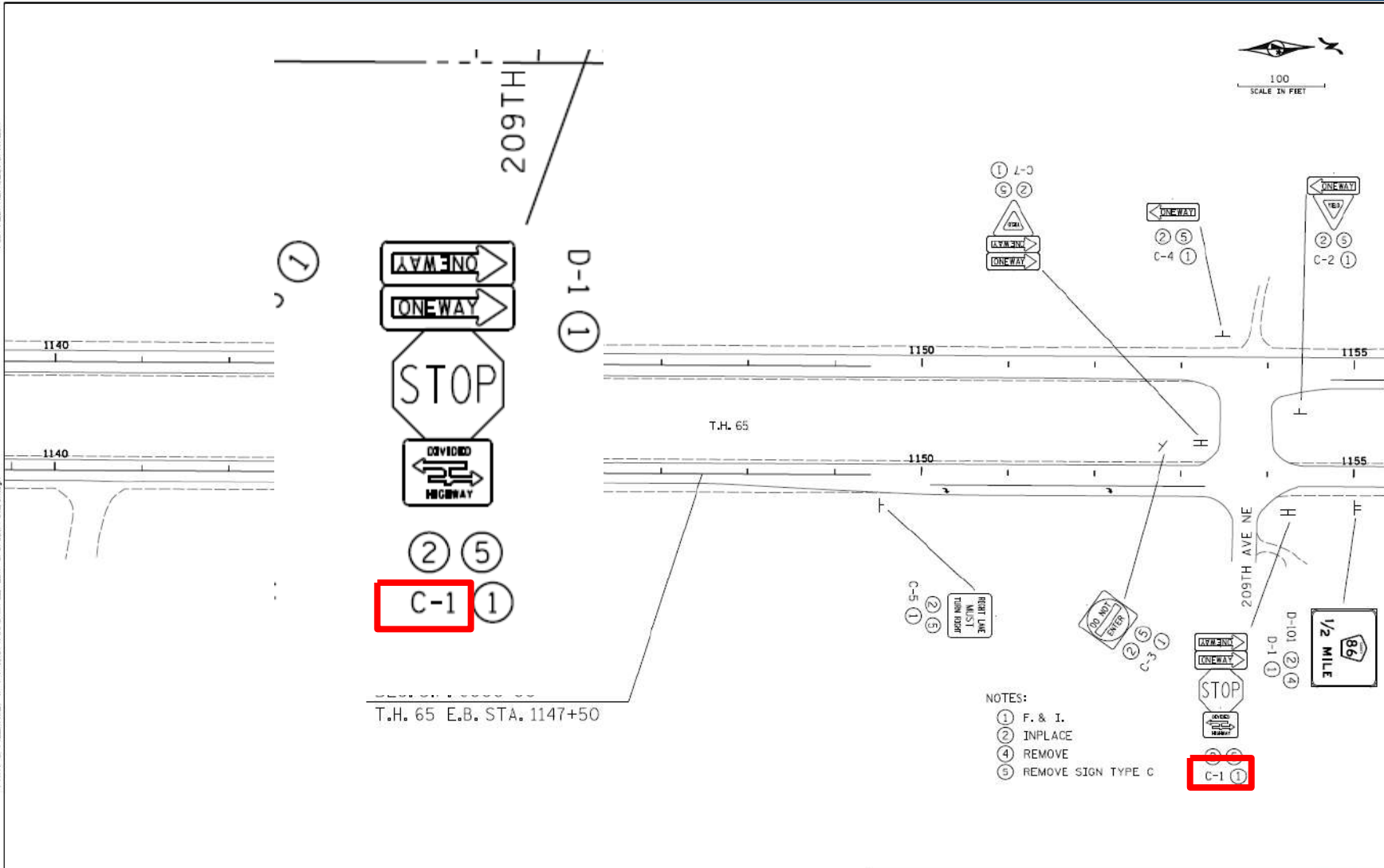
Roadway Layout

Stationing



Roadway Layout

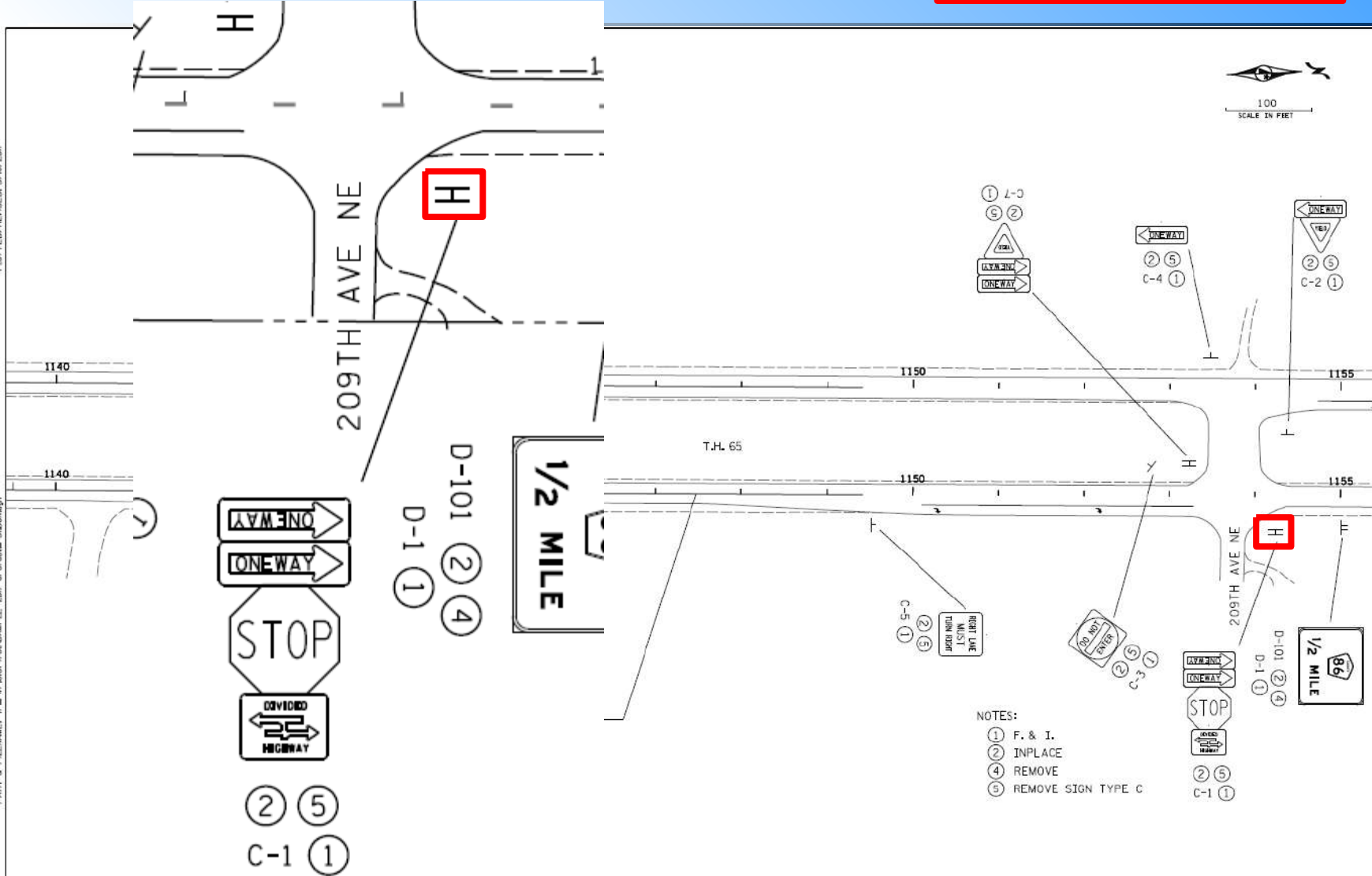
Sign Numbers



- NOTES:
- ① F. & I.
 - ② INPLACE
 - ④ REMOVE
 - ⑤ REMOVE SIGN TYPE C

Roadway Layout

Sign Locations



Roadway Layout

Notes

NOTES:

- ① F. & I.
- ② INPLACE
- ③ SALVAGE
- ④ REMOVE
- ⑤ REMOVE SIGN TYPE C
- ⑥ INSTALL
- ⑦ F. & I. SIGN PANEL OVERLAY(S)

F. & I. = Furnish and Install

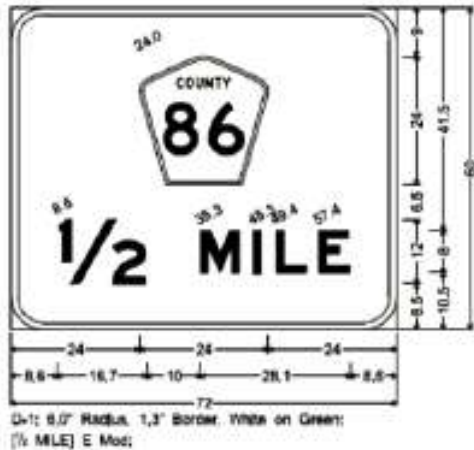
INPLACE = Signs to keep inplace

SALVAGE = Signs that should be salvaged

REMOVE = Signs that should be removed

INSTALL = Signs that should be installed

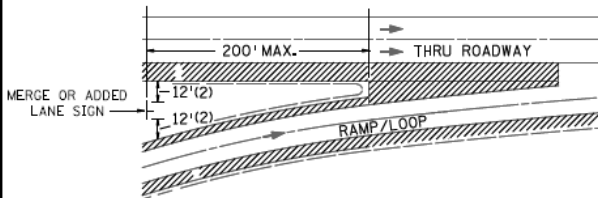
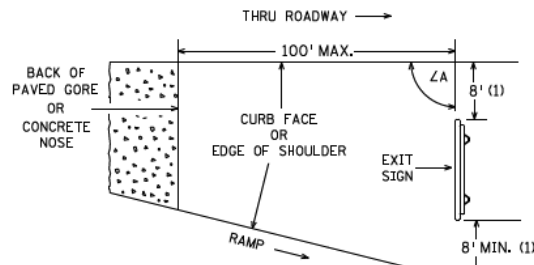
Type D Sign Panels



- SignCAD software used to design panels
- Sign panel dimensioning
- See Standard Signs and Pavement Markings Manual for arrow, fraction and overlay details.
- Guide Sign Design Course offered in July

Sign Placement

GORE PLACEMENT



SPECIFIC NOTES:

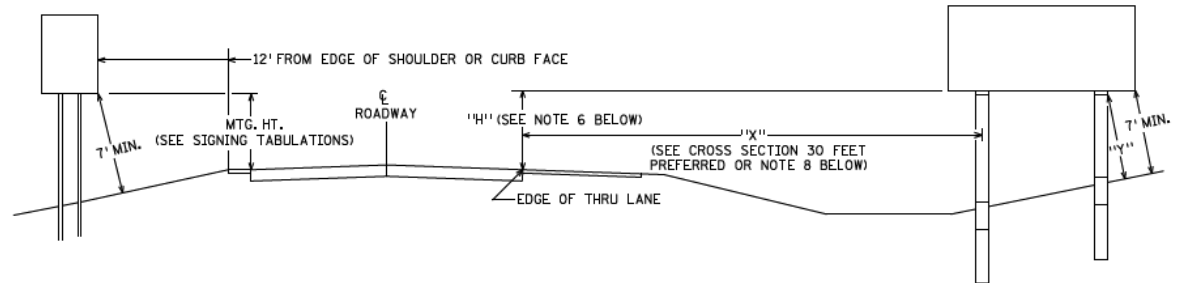
(1) EXIT SIGN

IF THESE OFFSETS CANNOT BE ATTAINED WITHIN 100 FEET OF THE PAVED GORE, A 4 FOOT OFFSET IS ACCEPTABLE. IF THE 4 FOOT OFFSETS CANNOT BE ATTAINED WITHIN 100 FEET OF THE PAVED GORE, CONTACT THE PROJECT ENGINEER.

(2) MERGE OR ADDED LANE SIGN

IF THESE OFFSETS CANNOT BE ATTAINED WITHIN 200 FEET OF THE PAVED GORE, A 4 FOOT OFFSET IS ACCEPTABLE. IF THE 4 FOOT OFFSETS CANNOT BE ATTAINED WITHIN 200 FEET OF THE PAVED GORE, CONTACT THE PROJECT ENGINEER.

ROADSIDE PLACEMENT



ROUTE MARKER, REGULATORY & WARNING SIGNS - TYPE C
GUIDE SIGNS - TYPE D

GUIDE SIGN - TYPE A

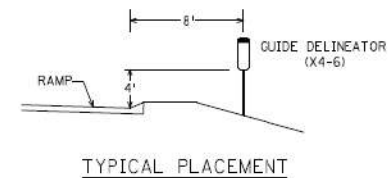
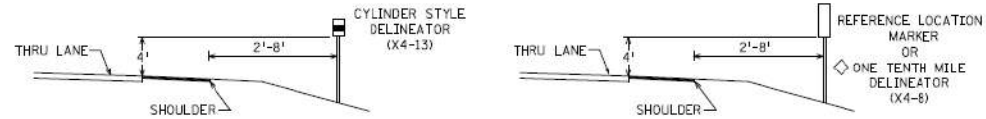
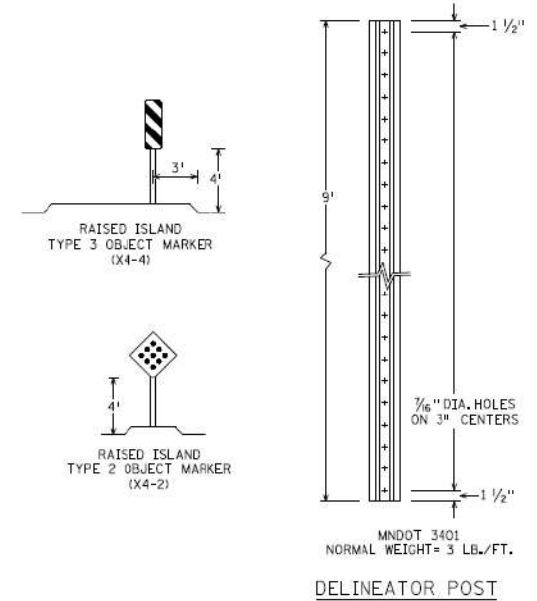
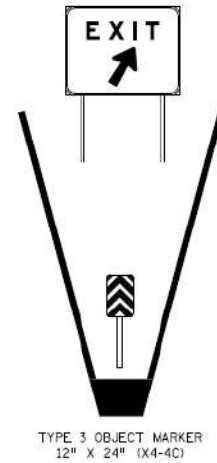
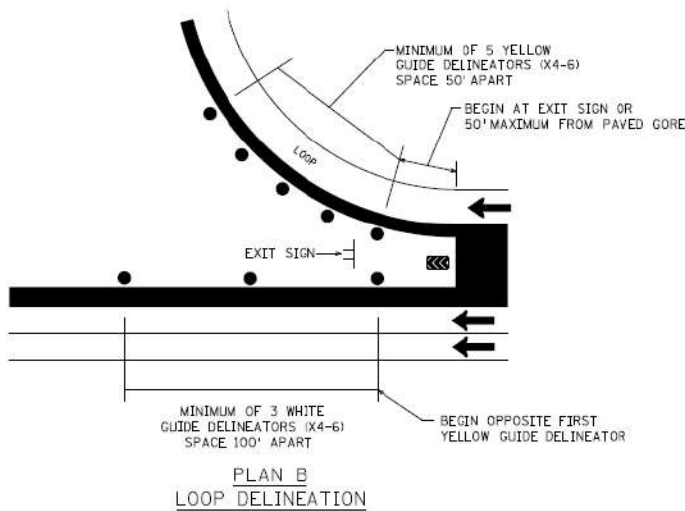
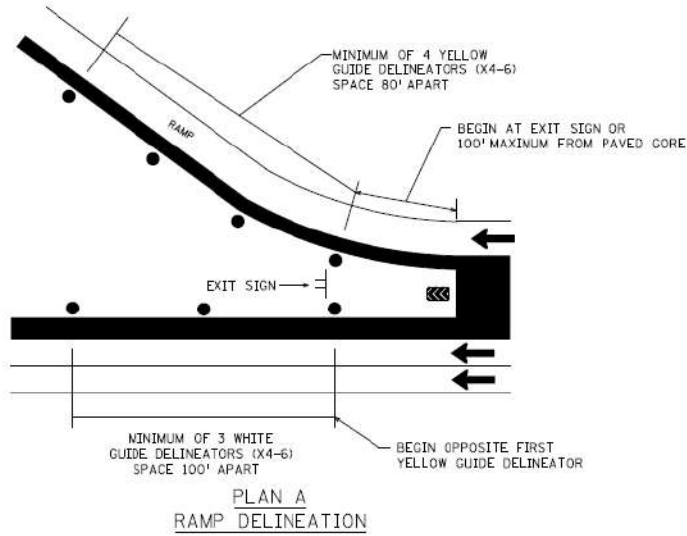
NOTES:

1. ALL TYPE C AND D MOUNTING HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE ELEVATION OF THE NEAR EDGE OF PAVEMENT IN RURAL AREAS OR TO THE TOP OF THE CURB OR IN THE ABSENCE OF CURB, TO THE NEAR EDGE OF THE TRAVELED WAY.
2. SIGN FACES SHALL BE VERTICAL.
3. OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.
4. TO AVOID SPECULAR GLARE, $\angle A$ SHALL BE APPROXIMATELY 93° FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF THRU LANE AND APPROXIMATELY 92° FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF THRU LANE. THIS APPLIES TO SIGNS TYPE A, C, & D AND INCLUDES SIGNS IN THE GORE.
5. 'Y' IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'.
6. WHERE 'X' IS LESS THAN 30', 'H' SHALL BE 7', WHERE 'X' IS 30' OR GREATER, MINIMUM AND PREFERRED 'H' IS 5'.
7. LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.
8. WHEN A TYPE A SIGN IS INSTALLED DIRECTLY BEHIND TRAFFIC BARRIER, THE LEFT EDGE OF THE SIGN PANEL SHALL BE LOCATED A MINIMUM OF 8 FEET BEHIND THE FACE OF THE TRAFFIC BARRIER.

TEM Figure 6.1

SIGN PLACEMENT

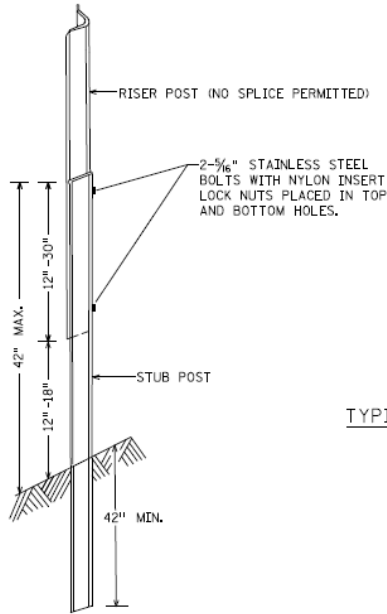
Delineators & Markers



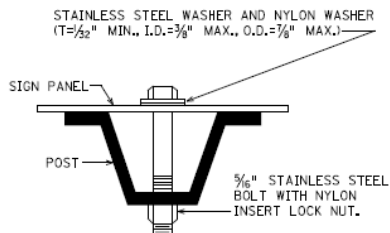
Type C & D Signs Structural Details

TEM Charts
6.3 and 6.4

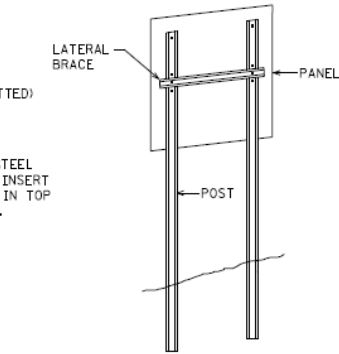
TYPE C & D POST



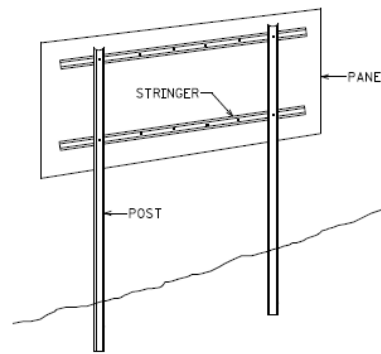
U POST BREAKAWAY SPLICE



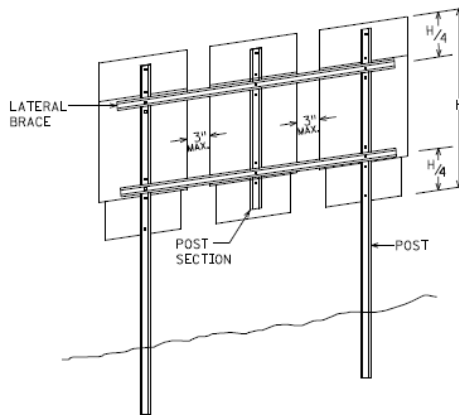
U POST MOUNTING
TYPE C SIGNS



TYPICAL TYPE C INSTALLATION



TYPICAL TYPE D INSTALLATION



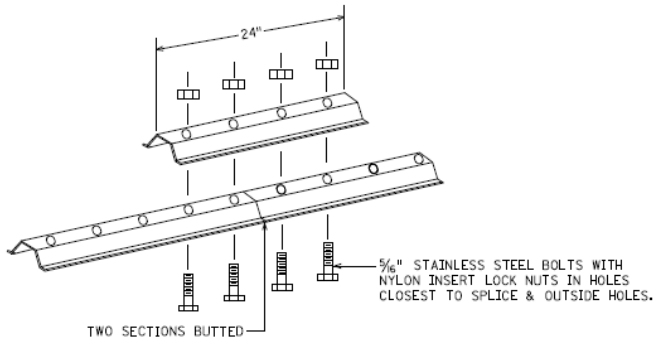
MODIFIED TYPE C INSTALLATION

NOTES:

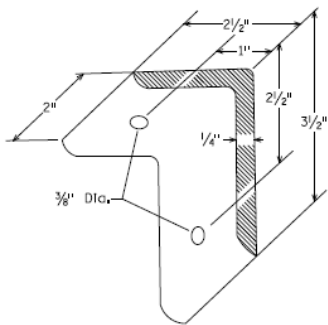
1. USE 3 LB/FT STUB POSTS, SHALL CONFORM TO MNDOT 3401.
2. USE 2.5 LB/FT RISER POSTS, STRINGERS, KNEE BRACES AND LATERAL BRACES, ALL SHALL CONFORM TO MNDOT 3401.
3. SEE SIGN DATA SHEETS FOR NUMBER OF POSTS, KNEE BRACES, POST LENGTHS AND SPACINGS, AS DETERMINED FROM TEM CHARTS 6.3 AND 6.4.
4. IF MORE THAN TWO POSTS ARE NEEDED, THE MINIMUM SPACING SHALL BE 45' BETWEEN POSTS.
5. TYPE D SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE D STRINGER AND PANEL-JOINT DETAIL (SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL).
6. MOUNTING (PUNCH CODE) FOR TYPE C SIGN PANELS SHALL BE AS INDICATED IN THE MNDOT STANDARD SIGNS AND MARKINGS MANUAL UNLESS OTHERWISE SPECIFIED.
7. ALL RISER (VERTICAL) U POSTS SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
8. USE STAINLESS STEEL 3/8\" BOLTS, WASHERS AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
9. STAINLESS STEEL WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
10. BRACING STUBS SHALL BE NO MORE THAN 4' ABOVE GROUND AND EMBEDDED AT LEAST 42\".
11. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MNDOT 3306 AND GALVANIZED IN ACCORDANCE WITH MNDOT 3394.
12. COLLARS SHALL BE USED TO SHIM OVERLAYS AND LEGEND COMPONENTS AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MNDOT 3352.2A6.
13. 2 POST TYPE C SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE. INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60\" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
14. WHERE 2 SINGLE POST TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED Laterally BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
15. WHERE 3 OR MORE TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED Laterally BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND POST SECTION AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN MODIFIED TYPE C INSTALLATION.

TYPE C & D SIGN
STRUCTURAL DETAILS

Type C & D Signs Structural Details

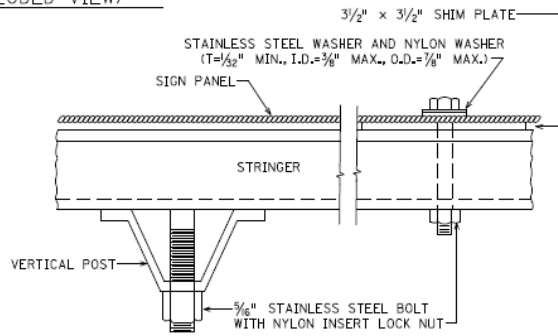


LATERAL BRACE OR STRINGER
SPLICE DETAIL (EXPLODED VIEW)

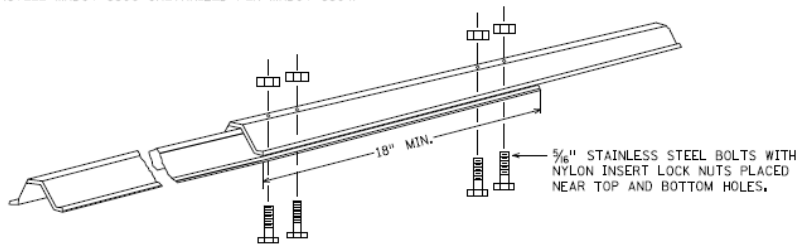


A-FRAME BRACKET

(STEEL MNDOT 3306 GALVANIZED PER MNDOT 3394)

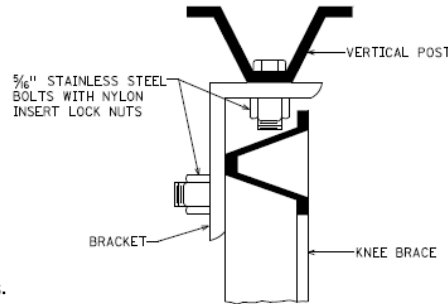


SECTION B-B

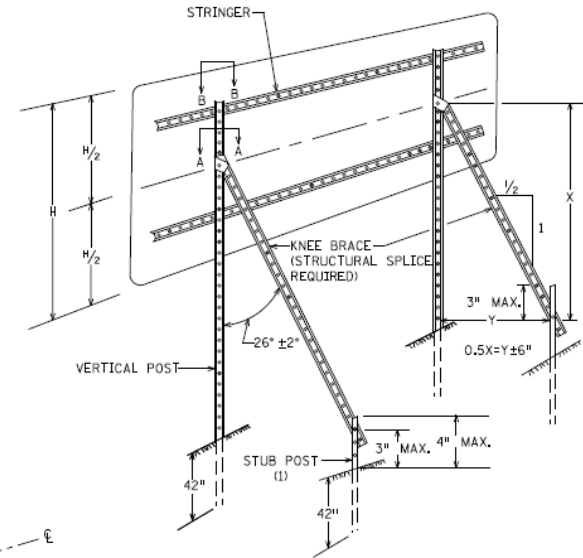


STRUCTURAL SPLICE

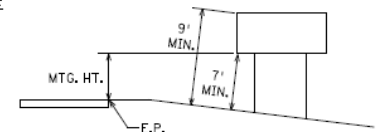
(USE WHEN IT IS NECESSARY TO FABRICATE THE CORRECT LENGTH OF POST FROM TWO PIECES)



SECTION A-A

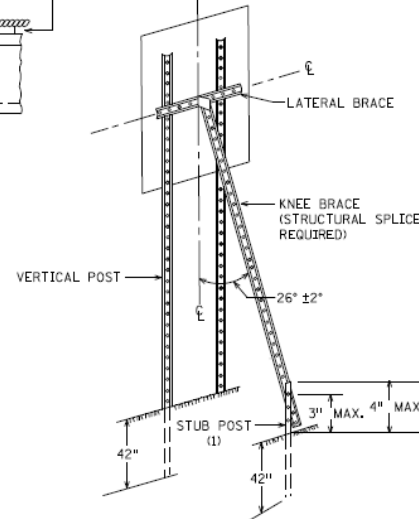


TYPICAL "A-FRAME" INSTALLATION
TYPE "D" SIGNS



TYPICAL MOUNTING

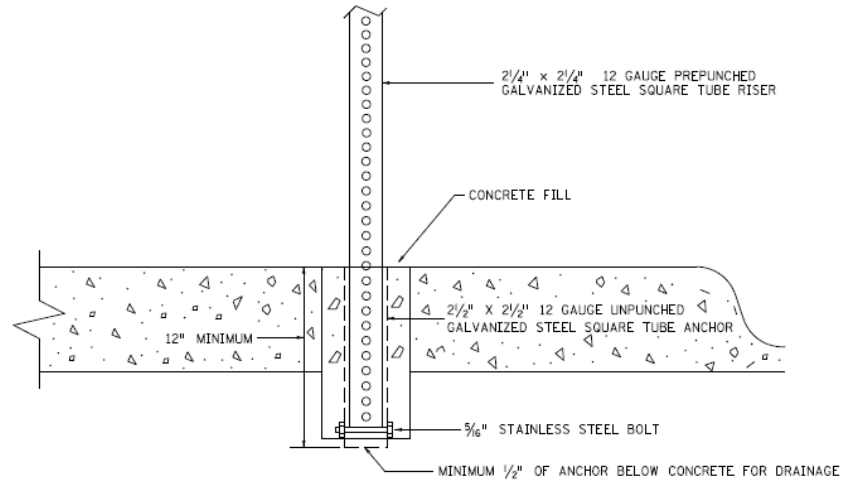
(1) OFFSET STUB POST 1' TOWARD ROADWAY
RELATIVE TO VERTICAL POST. ATTACH STUB
POST AND KNEE BRACE BACK TO BACK.



TYPICAL "A-FRAME" INSTALLATION
TYPE "C" SIGNS

TYPE C & D SIGN STRUCTURAL DETAILS

Type C Signs, Delineators & Markers in Concrete

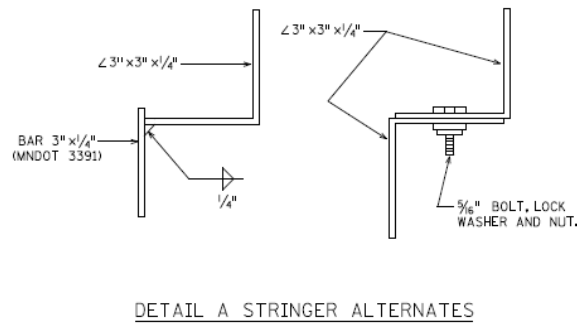
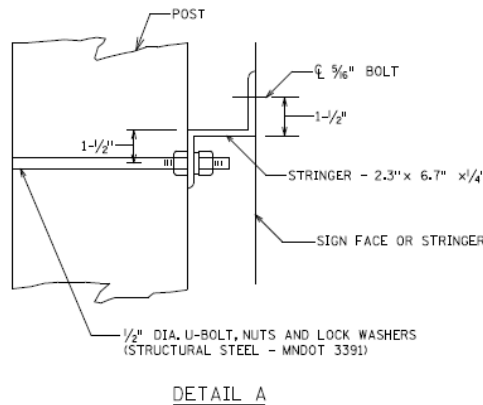
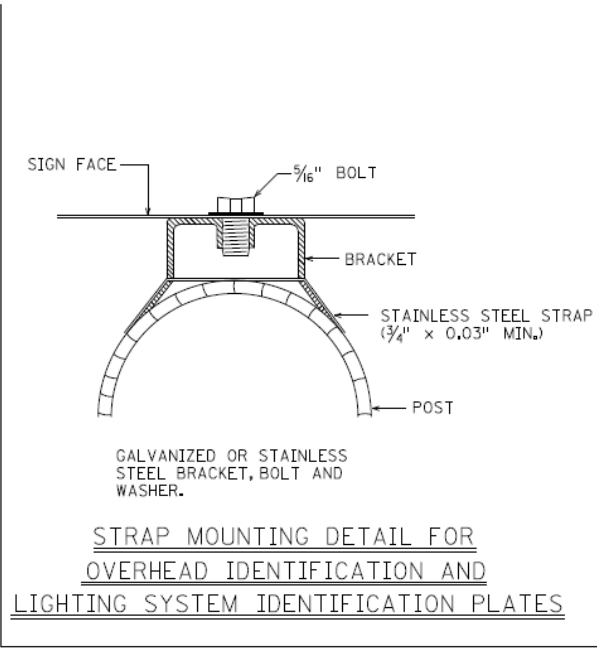
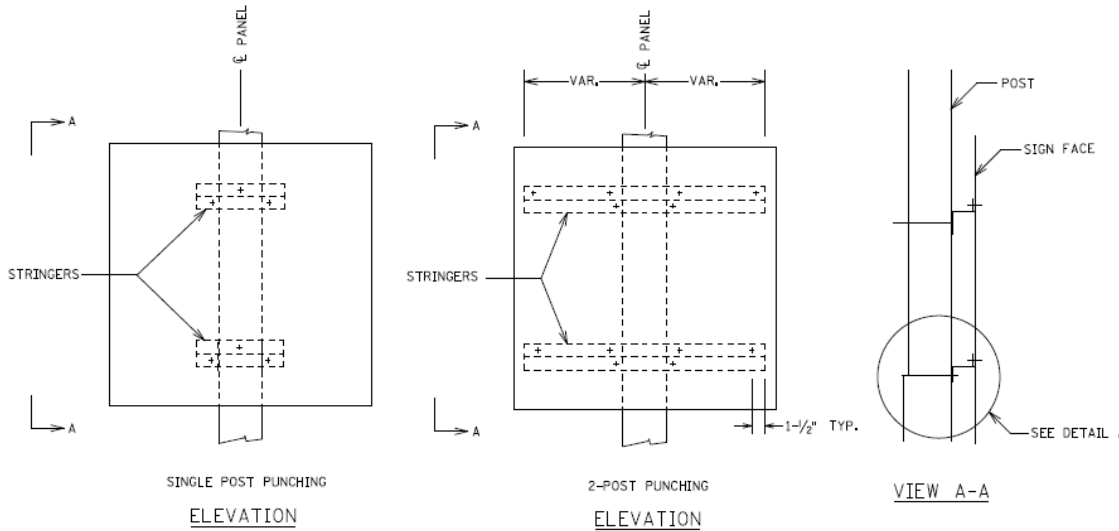


NOTES:

1. DRILL AN 8" DIAMETER HOLE THE FULL DEPTH OF THE ANCHOR.
2. DRILL $\frac{3}{8}$ " HOLES ON OPPOSITE SIDES OF THE UNPUNCHED GALVANIZED STEEL SQUARE TUBE ANCHOR APPROX. 1" FROM THE BOTTOM OF THE ANCHOR. INSERT A $\frac{5}{16}$ " STAINLESS STEEL BOLT THROUGH THE HOLES AND SECURE WITH A STAINLESS STEEL LOCK NUT WITH NYLON INSERT. THE PREPUNCHED GALVANIZED STEEL SQUARE TUBE RISER (TO BE INSERTED INSIDE THE UNPUNCHED GALVANIZED SQUARE TUBE ANCHOR) WILL REST ON BOLT.
3. INSERT THE ANCHOR IN THE HOLE.
4. AFTER INSTALLATION OF THE UNPUNCHED GALVANIZED STEEL SQUARE TUBE ANCHOR, FILL THE HOLE WITH A CONCRETE MIX APPROVED BY THE ENGINEER AND LEVEL OFF THE TOP OF CONCRETE.
5. MAXIMUM SIGN PANEL SIZE IS 42" WIDE X 48" HIGH.
6. SIGN PANEL TO BE MOUNTED 7 FT ABOVE THE GROUND.

TYPE C SIGNS, DELINEATORS &
MARKERS IN CONCRETE

Type C and D Structural Steel Mounting System for Round Supports



- NOTES:**
- FOR DETAILS AND NOTES NOT SHOWN SEE "C" & "D" SIGN DETAILS.
 - FOR BACK TO BACK MOUNTINGS, ROTATE STRINGERS FOR ONE PANEL 180° FROM WHAT IS SHOWN SUCH THAT PANELS CAN BE MOUNTED AT SAME ELEVATION.
 - DETAIL A STRINGER MAY BE ONE OF THE THREE DESIGNS DETAILED OR AN APPROVED EQUAL. STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH MNDOT 3306 AND GALVANIZED IN ACCORDANCE WITH MNDOT 3394. FASTENERS SHALL BE IN ACCORDANCE WITH MNDOT 3391.2B AND SHALL BE GALVANIZED EITHER BY THE HOT-DIP PROCESS IN ACCORDANCE WITH ASTM A153, OR BY THE MECHANICAL PROCESS IN ACCORDANCE WITH ASTM B695, CLASS 50 OR GREATER.

SIGN TYPE C AND D STRUCTURAL STEEL MOUNTING SYSTEM FOR ROUND SUPPORTS

Common Plan Set Issues

- **The following is a list of some of the common issues with plan sets from MnDOT reviewers**
- **These are not in any order of importance**

Common TTC Plan Set Issues

- ✓ The designer uses PLACE instead of INSTALL. Whenever INSTALL is used by itself it implies that the material is either salvaged or supplied. It is preferred to use PLACE, FURNISH AND INSTALL (F & I), or CONSTRUCT.
 - INSTALL by itself implies that material is either salvaged or supplied. If this IS the case, it is OK to leave it (usually, this is not the case). When it is not INSTALL, and as previously noted, use PLACE, F & I, or CONSTRUCT.
- ✓ When using reference points, they need to be written in the standard format of XXX+XX.XXX.
- ✓ Ensure to label the mainline and cross streets as well as bridges and what the bridges cross over/under.
 - For Bridge labeling, use the Bridge Number as shown in the rest of the plan. Also label what it is over/under such as roadway, railroad, river name, etc.

Common TTC Plan Set Issues

- ✓ Check that the labelling at the bottom of the sheet matches the rest of the plan (e.g. SP XXXX-XX (TH XX)).
- ✓ Make sure the legend matches what is shown in the plan.
- ✓ Check that the sheet numbers in the signature block are correct and that they include their printed name.
- ✓ Ensure that pay items agree with what's shown on the plan and that all items are accounted for.
- ✓ Make sure all signs are accounted for in the tab/summary, especially the special signs.
- ✓ Manual details are not necessary in the plan as they are in the manuals. If they are, make sure the notes and references all make sense.

Design Scene

- A guidance document for designers, technicians and engineers to help improve the quality and reduce cost and time of plan preparation



Chapter 14 - Impact Attenuators

By: Y. Crocker with assistance from Kevin Farrar

In order to avoid external conflicts and maintain consistency within MnDOT, we will be changing how we call out temporary and permanent impact attenuators on our traffic control plans.

We will be specifying whether they are TL3's or TL2's (test level's) instead of posted speed limits.

All Temporary Impact Attenuators that are to be placed on roads with the speeds of 50 mph or greater will now be TL3 and those that are 45 mph or less shall be TL2. These will be noted on our Pay Item Tabulation sheets like we have been doing. If the project requires both TL3 and TL2 attenuation, then they should be labeled on the plan sheets for clarification.

Examples: Same test level for all...

PAY ITEM TABULATION		TC
PAY ITEM	UNIT	TEST
PORTABLE PREGRAST CONCRETE BARRIER SYSTEM	LN FT	300
PORTABLE PRECAST CONCRETE BARRIER SYSTEM	LN FT	250
IMPACT ATTENUATOR	450 SQ FT	1
TRAFFIC CONTROL	1000 SQ YD	1
REPAIRABLE CONCRETE AND METAL	YD	40
REPAIRABLE CONCRETE AND METAL	UNIT DAY	100
REPAIRABLE PRECAST CONCRETE BARRIER SYSTEM	LN FT	250
REPAIRABLE PRECAST CONCRETE BARRIER SYSTEM	LN FT	250

- (1) TL3 ATTENUATOR
- (2) 20 MILES PER HOUR - ALL ONE WAY
- (3) 30' - 1" SOLID LINE WHITE, 8" - 4" BROKEN LINE WHITE, 1500' - SOLID LINE YELLOW

