

**Record Plans**

Contractor: Engineers Construction, Inc. - Williston, Vermont  
 Resident Engineer: Josh Hulett  
 Construction Began: July 20, 2016  
 Construction Complete: October 25, 2016  
 Record Plans By: Josh Hulett / Paul Beyor

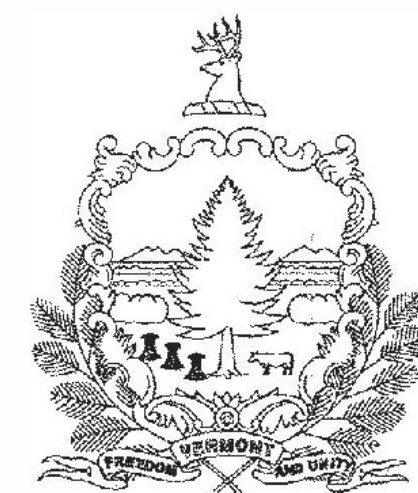
I hereby certify that all construction required by this set of drawings has been accomplished as indicated herein.

BY: Josh Hulett Resident Engineer  
 Josh Hulett

Date: MARCH 9, 2017

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

# STATE OF VERMONT AGENCY OF TRANSPORTATION

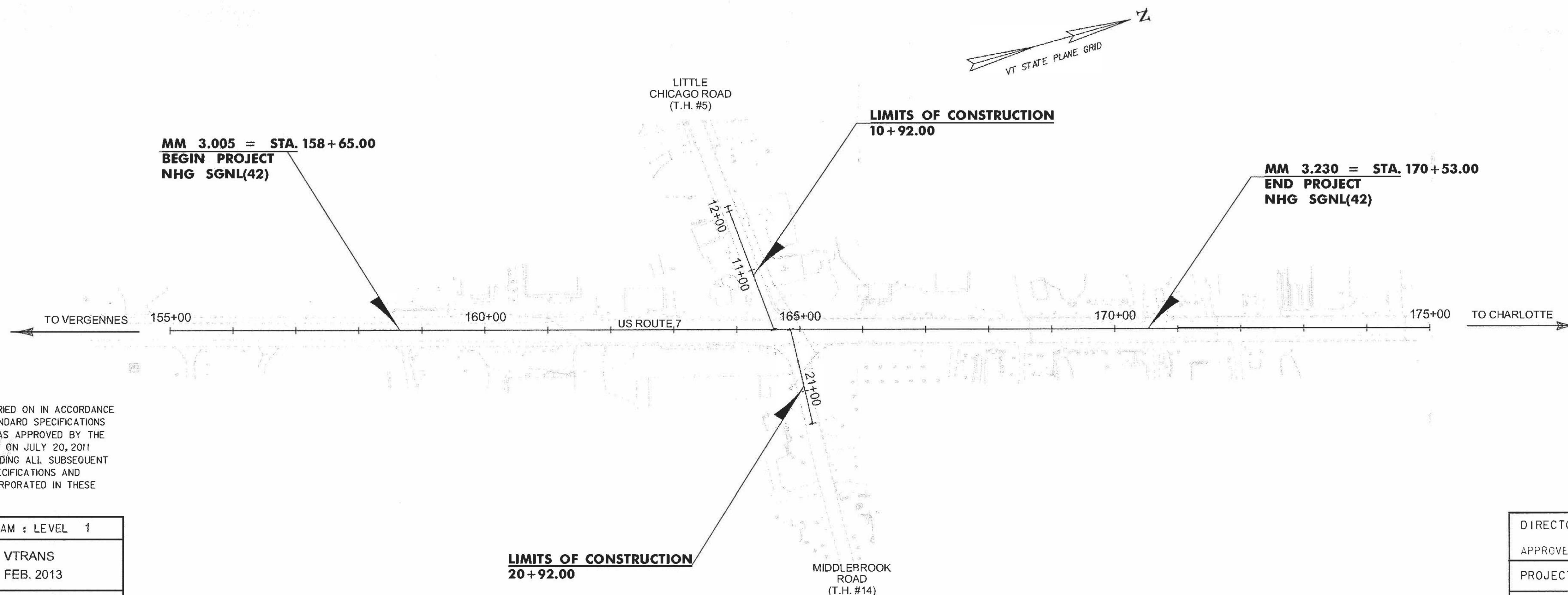
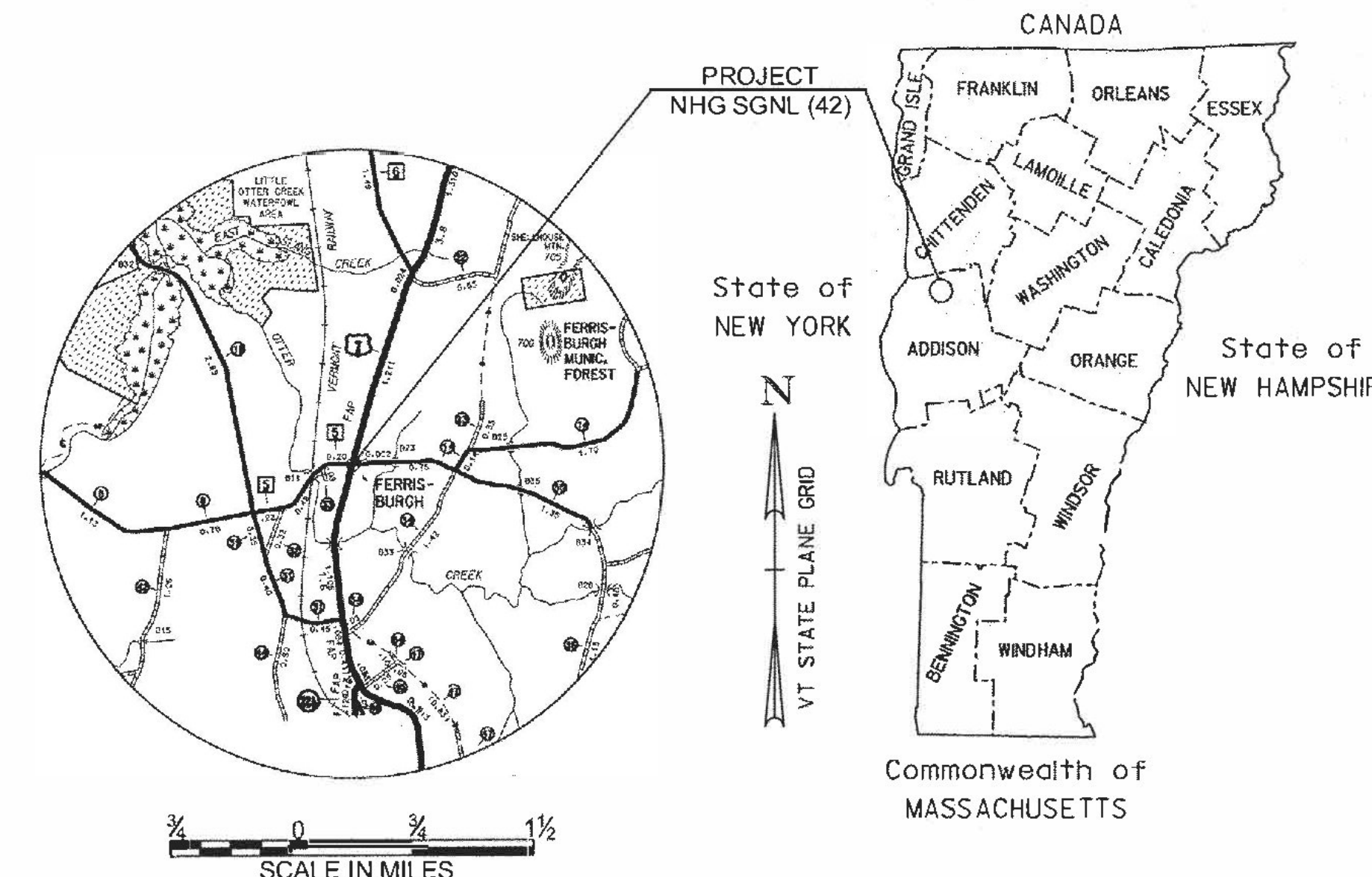


## PROPOSED IMPROVEMENT TOWN OF FERRISBURGH COUNTY OF ADDISON US ROUTE 7 (PRINCIPAL ARTERIAL) (NHS)

BEGINNING AT A POINT ON US ROUTE 7 APPROXIMATELY 594 FT SOUTHERLY OF THE INTERSECTION OF LITTLE CHICAGO ROAD (TH-5) AND MIDDLEBROOK ROAD (TH-14) IN THE TOWN OF FERRISBURGH (MM 3.005) AND EXTENDING NORTHERLY A DISTANCE OF 1188.00 FT (0.225 MI).

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES THE CONSTRUCTION OF A TRAFFIC SIGNAL SYSTEM, SIGNING AND OTHER HIGHWAY RELATED WORK.

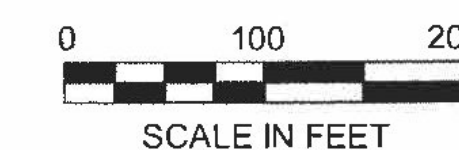
LENGTH OF PROJECT = 1188.00 FT = 0.225 MI



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 1	
SURVEYED BY :	VTRANS
SURVEYED DATE :	FEB. 2013
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83 (2007)

DIRECTOR OF PROJECT DELIVERY	
APPROVED: <u>Patricia Coburn</u>	DATE: <u>3/2/2016</u>
PROJECT MANAGER : PATRICIA COBURN, P.E.	
PROJECT NAME : FERRISBURGH	
PROJECT NUMBER : NHG SGNL(42)	
SHEET 1 OF 22 SHEETS	



# PRELIMINARY INFORMATION SHEET

## INDEX OF SHEETS

PLAN SHEETS		STANDARDS LIST	
1	TITLE SHEET	B-71	STANDARDS FOR RESIDENTIAL AND COMMERCIAL DRIVES
2	PRELIM INFORMATION AND GENERAL NOTES	C-10	CURBING
3	CONVENTIONAL SYMBOLOLOGY LEGEND SHEET	D-20	HIGHWAY CROSSING FOR UNDERGROUND UTILITIES
4	TYPICAL SECTION SHEET	E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD
5	TIE SHEET	E-145A	REGULATORY SIGN DETAILS - LANE USE CONTROL SIGNS
6	BORING INFORMATION SHEET	E-171A	TRAFFIC CONTROL SIGNALS GENERAL NOTES & DETAILS
7-8	BORING LOG SHEETS	E-171B	TRAFFIC CONTROL SIGNALS MISC. DETAILS
9	QUANTITY SHEET	E-171C	TRAFFIC CONTROL SIGNALS CANTILEVER MOUNTING DETAILS
10	PLAN SHEET	E-173	PULL BOXES AND JUNCTION BOXES
11	CURBING PLAN SHEET	E-175	POWER DROP STANCHIONS
12	TRAFFIC SIGNS SHEET	T-1	TRAFFIC CONTROL GENERAL NOTES
13	TRAFFIC SIGN SUMMARY SHEET	T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING
14	TRAFFIC SIGN DETAIL SHEET	T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS
15	TRAFFIC SIGNAL PLAN	T-28	CONSTRUCTION SIGN DETAILS
16	TRAFFIC SIGNAL GENERAL NOTES	T-30	CONSTRUCTION SIGN DETAILS
17	TRAFFIC SIGNAL SYSTEM NOTES	T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS
18-19	MAST ARM CROSS SECTION SHEETS	T-45	SQUARE TUBE SIGN POST AND ANCHOR
20	TRAFFIC CONTROL PLAN	T-93	DESTINATION SIGN DETAILS
21	MAST ARM POLE DETAILS SHEET	T-133	LIGHT POLE FOUNDATION DETAILS
22	STREET LIGHTING DETAILS & NOTES SHEET	T-134	LIGHT POLE AND TRANSFORMER BASE DETAILS

## GENERAL NOTES

- ANY DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE EXISTING UTILITIES WITHIN AND ADJACENT TO THE LIMITS OF WORK. IN THE EVENT OF DAMAGE TO THESE AS A RESULT OF THE CONTRACTORS OPERATIONS, THE REPAIRS OR REPLACEMENT SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE AS APPROVED BY THE ENGINEER.
- REMOVAL OF PAVEMENT MARKINGS AND TEMPORARY PAINT MARKING ITEMS HAVE BEEN INCLUDED IN THIS CONTRACT. IF APPLICABLE, THESE ITEMS ARE TO BE INSTALLED PER THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER.
- COORDINATION WILL BE REQUIRED WITH THE PRIME CONTRACTOR FOR THE MIDDLEBURY-FERRISBURGH NH SURF(55) PROJECT TO ENSURE CURBING WORK IS COMPLETED BEFORE THAT PROJECT CONSTRUCTS THE WEARING COURSE OF PAVEMENT IN THE AREAS WHERE CURB WORK IS TAKING PLACE.

## SEEDING FORMULA

VAOT URBAN AREA SEED MIX					
% WEIGHT	LBS/AC		NAME	GERM %	PURITY %
	BROADCAST	HYDROSEED			
42.50%	34	68	CREEPING RED FESCUE	85%	98%
10.00%	8	16	PERRENIAL RYE GRASS	90%	95%
42.50%	34	68	KENTUCKY BLUE GRASS	85%	85%
5.00%	4	8	ANNUAL RYE GRASS	85%	95%
<b>100.00%</b>	<b>80</b>	<b>160</b>			

### CONSTRUCTION NOTES:

- ALL SEED MIXTURES SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
- SEED: TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.
- FERTILIZER: FORMULA 10-20-10, TO BE USED WITH SEED, APPLIED AT THE RATE OF 500 LBS./ACRE. (HYDRO SEEDERS MAY USE 19-19-19 FORMULA).
- AGRICULTURAL LIMESTONE: TO BE APPLIED AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.
- HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF TWO TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.
- TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
- HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEEDING WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED.
- TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.
- MOWING: RECOMMENDED EARLY MOWING ONCE OR TWICE WHEN GRASS REACHES SIX INCH MAXIMUM HEIGHT TO PREVENT BROADLEAF WEED COMPETITION DURING ESTABLISHMENT PERIOD.

GENERAL GUIDANCE			
FERTILIZER		LIME	
BROADCAST	HYDROSEED	BROADCAST	HYDROSEED
10-20-10	19-19-19	PELLETIZED	LIQUID
500 LBS/AC	-	2 TONS/AC	4.4 GAL/AC

## TRAFFIC DATA

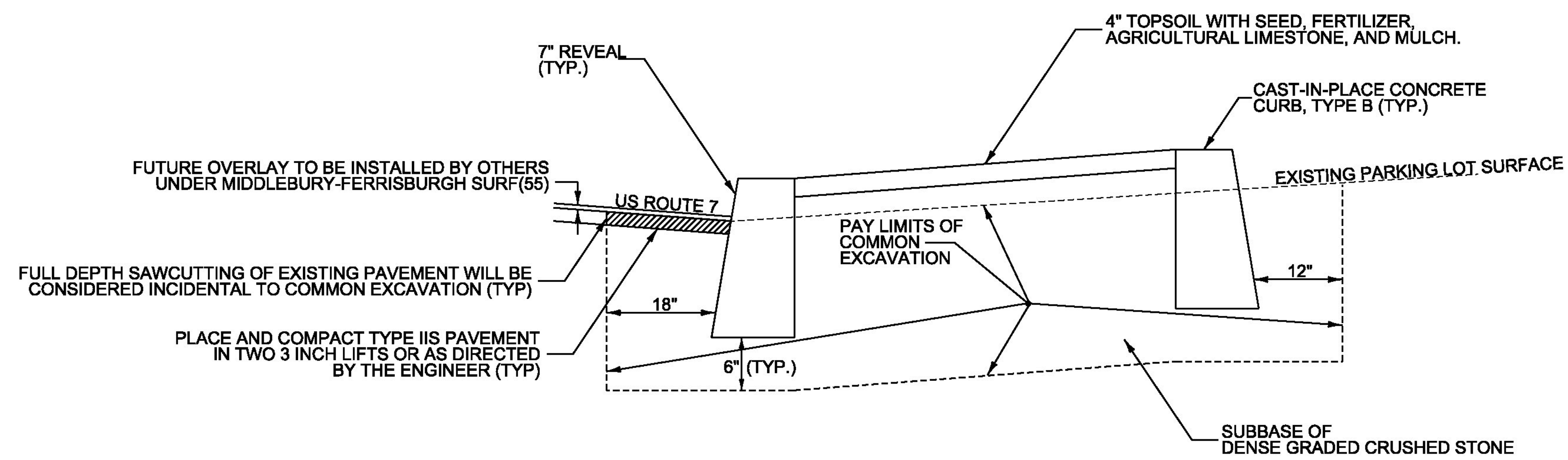
TRAFFIC DATA												
APPROACH	AADT		DHV		% T		% D		ADTT		ESALs	
	2014	2034	2014	2034	2014	2034	2014	2034	2014	2034	2014	2034
US 7 S	11,800	12,600	1400	1500	4.5	6	50	50	1100	1500	10,539,000	24,139,000
US 7 N	12,700	13,600	1400	1500	4.5	5.9	54	54	1100	1600	11,097,000	25,428,000
LITTE CHICAGO ROAD	1400	1500	180	190	1.3	2.1	65	65	120	210	448,000	1,024,000
MIDDLEBROOK ROAD	690	730	100	110	1.2	2.1	73	73	20	40	81,000	186,000

PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

FILE NAME: t13b016frm.dgn PLOT DATE: 3/2/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: K. RECORD  
DESIGNED BY: K. RECORD CHECKED BY: I. DEGUTIS  
PRELIM INFORMATION AND GENERAL NOTES SHEET 2 OF 22



# TYPICAL SECTION



## CURBED ISLAND DETAIL

NOT TO SCALE  
STA 162+04.79 - 164+69.09 RT.

### NOTES:

- MIDDLEBURY-FERRISBURGH NH SURF(55) PROJECT IS ANTICIPATED TO BE CONSTRUCTED CONCURRENTLY WITH BUT SEPARATELY FROM THIS PROJECT. MICROMILLING US-7 AND CONSTRUCTING A THIN OVERLAY THROUGH THE PROJECT AREA. CURBING WORK UNDER THIS CONTRACT SHALL BE COMPLETED PRIOR TO OVERLAY BY OTHERS.
- PAVEMENT REMOVED TO INSTALL CURBING SHALL BE REPLACED IN COMPACTED LIFTS MATCHING EXISTING PAVEMENT AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID AS ITEM 900.680 SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY). EMULSIFIED ASPHALT SHALL BE APPLIED BETWEEN LIFTS AND TO SAWCUT EDGES AS DIRECTED BY THE ENGINEER. EMULSIFIED ASPHALT WILL BE PAID AS ITEM 900.683 SPECIAL PROVISION (EMULSIFIED ASPHALT)(RS-1H OR CRS-1H).
- SEE CURBING PLAN SHEET, SHEET 11 FOR MORE INFORMATION.

PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

FILE NAME: t13b016frm.dgn PLOT DATE: 3/8/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: I. DEGUTIS  
DESIGNED BY: I. DEGUTIS CHECKED BY: P. COBURN  
TYPICAL SECTION SHEET SHEET 4 OF 22

GPS CONTROL POINTS

---HVCTRL #1---  
 P65 AZ MK  
 NORTH = 616700.663  
 EAST = 1443964.658  
 ELEV. = NA

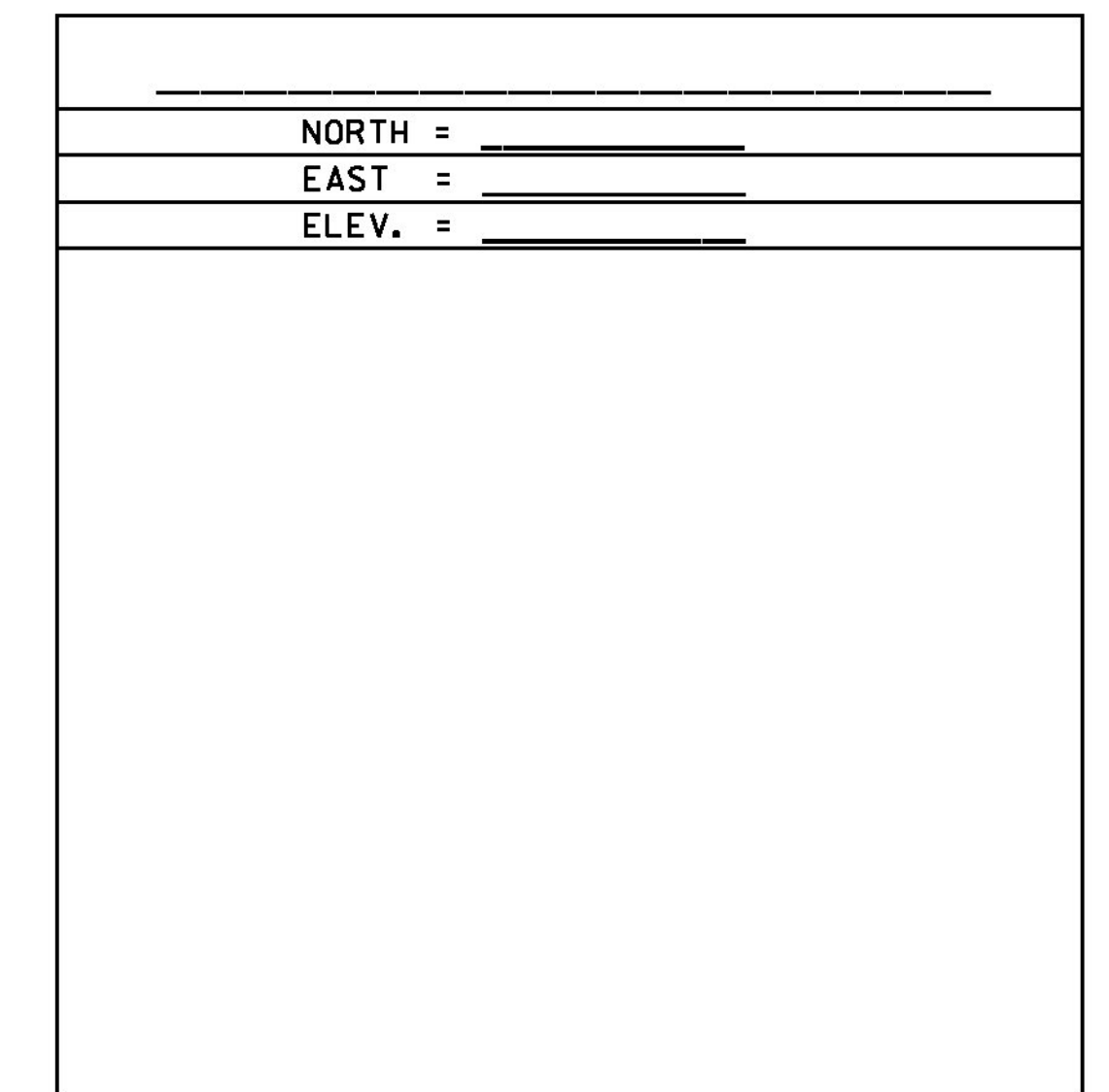
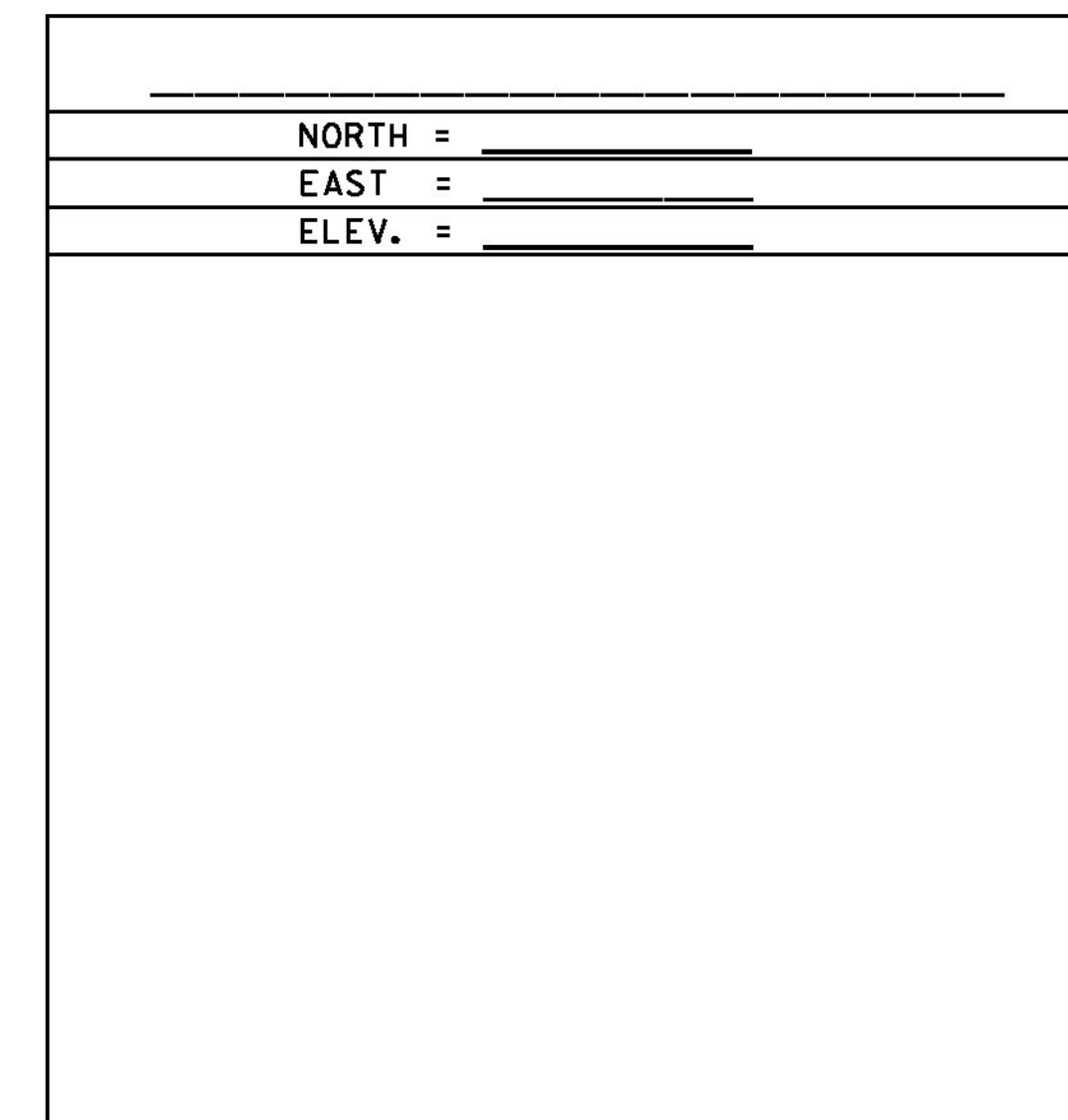
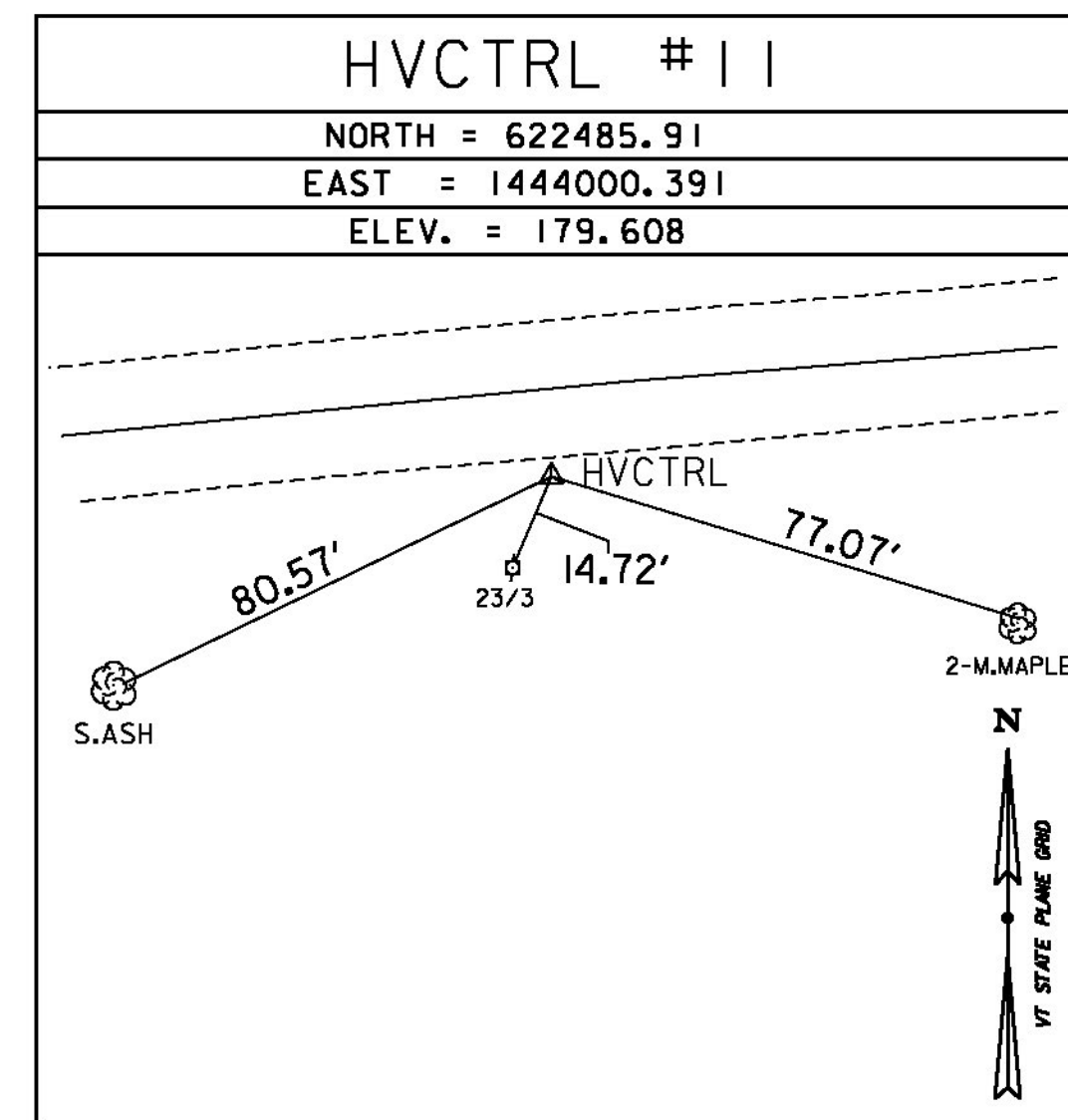
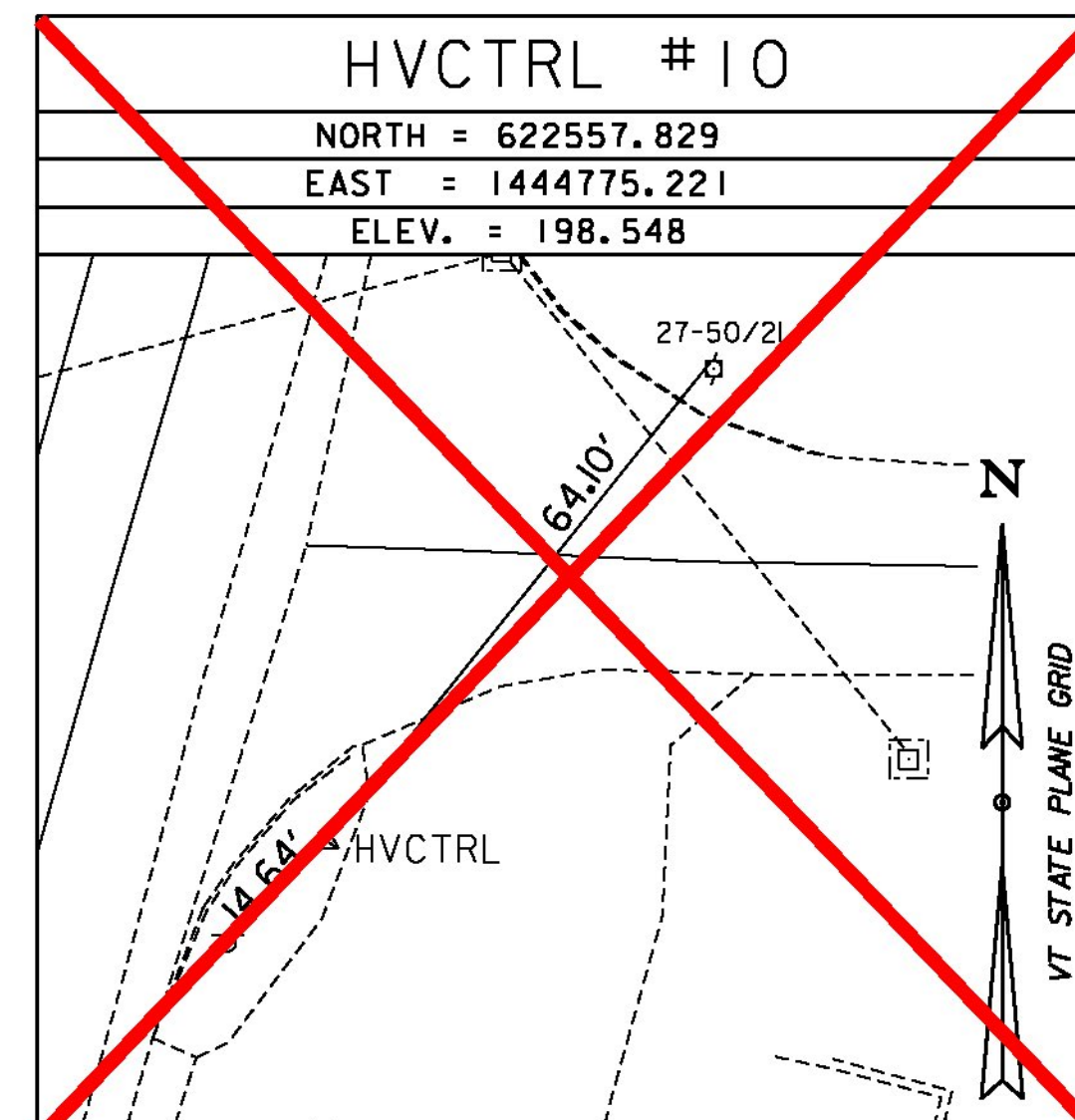
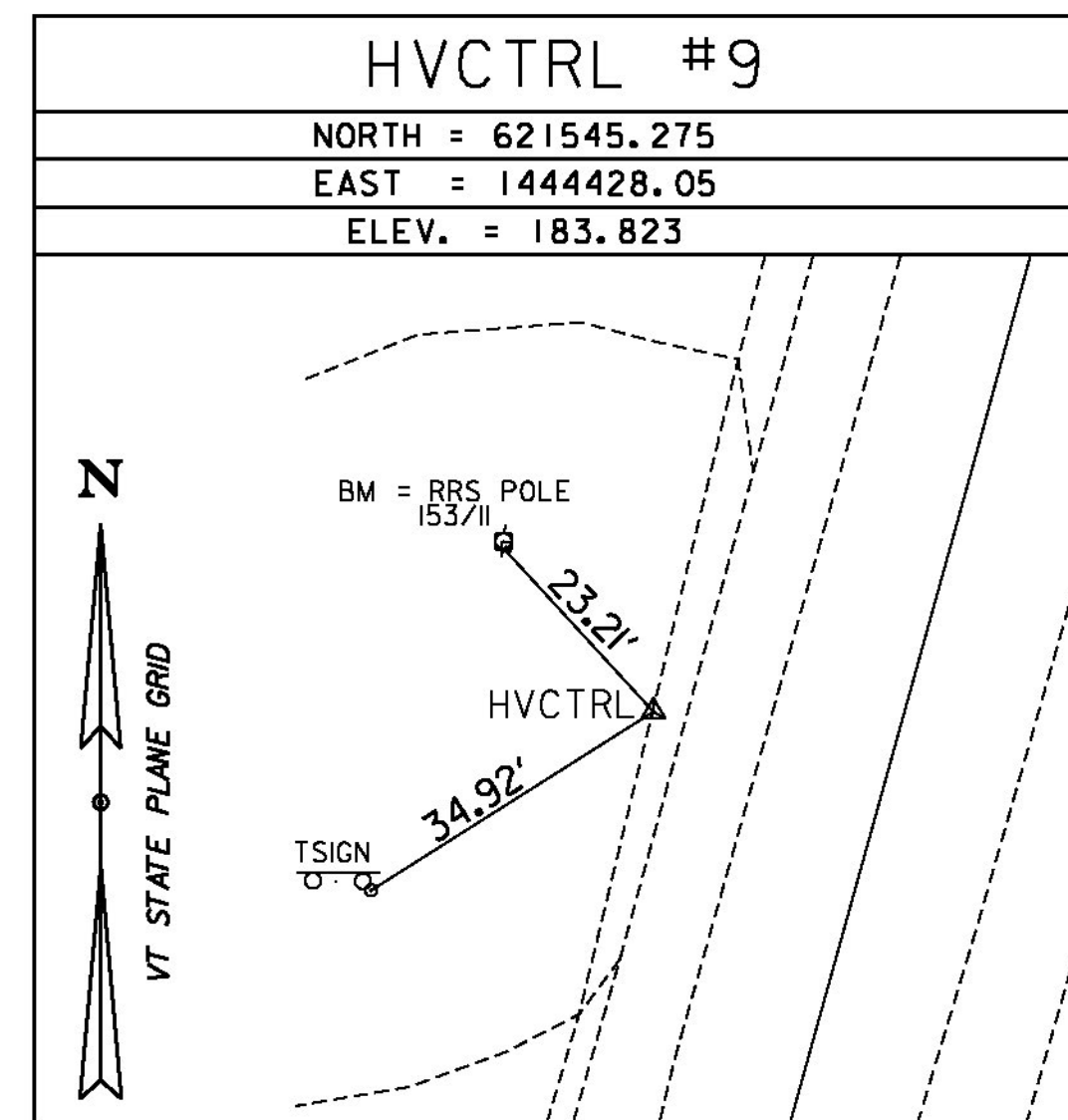
---HVCTRL #2---  
 P 65  
 NORTH = 614029.210  
 EAST = 1445286.970  
 ELEV. = 215.630

GENERAL LOCATION FERRISBURG, VERMONT. TO REACH FROM THE INTERSECTION OF VERMONT ROUTE 22A AND U.S. ROUTE 7 PROCEED NORTH ALONG U.S. ROUTE 7 FOR 0.5 MI (0.8 KM) TO TUPPERS CROSSING ROAD LEFT. PROCEED WEST ALONG TUPPERS CROSSING ROAD FOR 400 FT (121.9 M) TO THE MARK ON THE LEFT. THE MARK IS 110 FT (33.5 M) NORTHWEST OF A 24 IN BASS TREE, 107 FT (32.6 M) SOUTH OF THE CENTERLINE OF TUPPERS CROSSING ROAD AND 93 FT (28.3 M) SOUTH OF A FIBERGLASS WITNESS POST.

GENERAL LOCATION, VERGENNES, VT. TO REACH FROM THE INTERSECTION OF U.S.ROUTE 7 AND VT ROUTE 22A NORTHEAST OF VERGENNES GO SOUTH ALONG U.S.ROUTE 7 FOR 0.05 MI (0.08 KM) TO THE MARK ON THE RIGHT. THE MARK IS SET IN THE TOP OF A MASSIVE SLOPING ROCK OUTCROP. IT IS 17.0 M (55.8 FT) WEST OF AND ABOUT 3 M (9.8 FT) HIGHER THAN THE WEST EDGE OF PAVEMENT OF U.S.ROUTE 7. 98.8 M (324.1 FT) SOUTH OF THE SOUTH EDGE OF PAVEMENT OF VT ROUTE 22A, 13.4 M (44.0 FT) SOUTHWEST OF THE CENTER OF A DROP INLET, AND 3.6 M (11.8 FT) EAST OF A FIBERGLASS WITNESS POST.

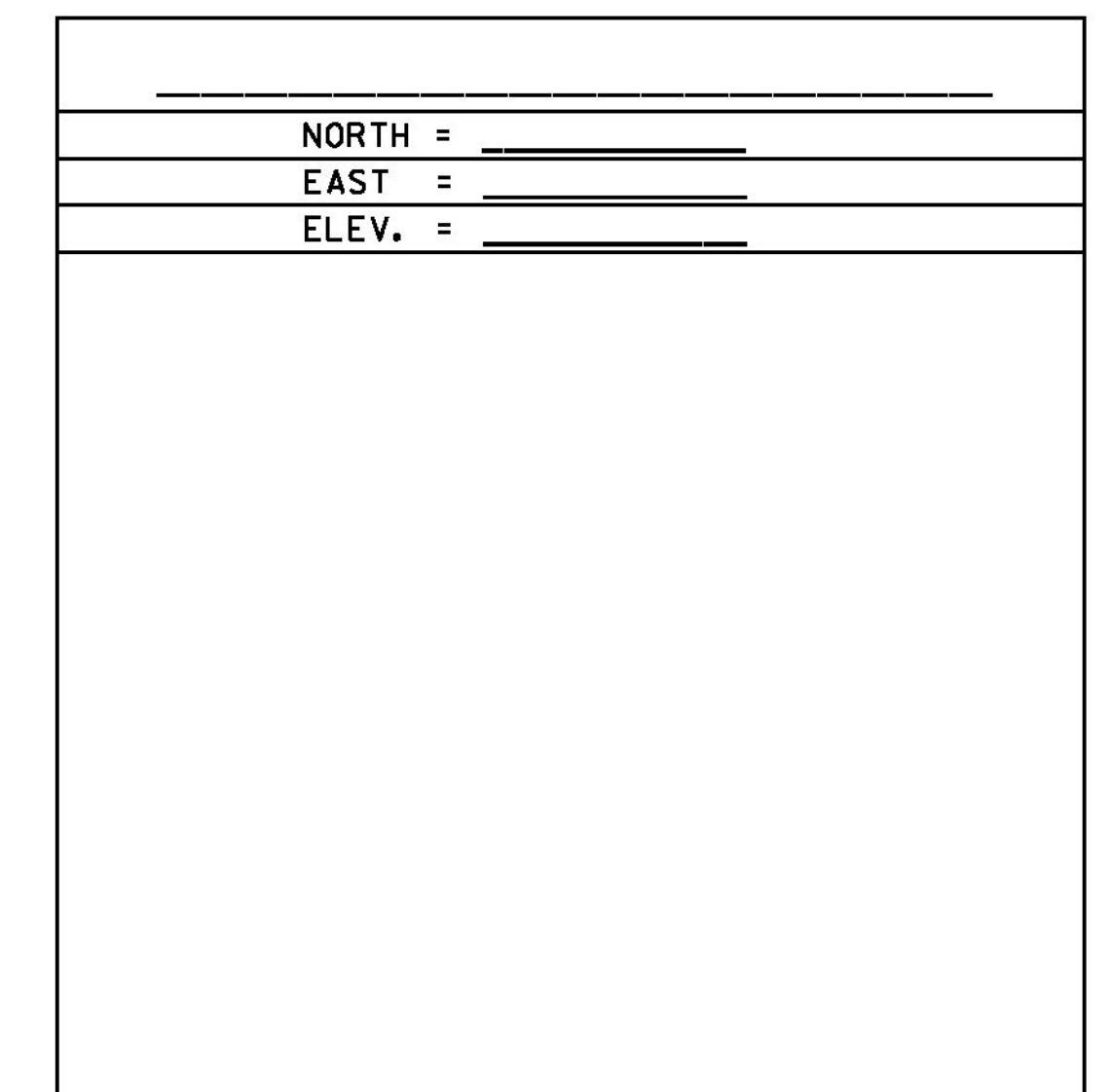
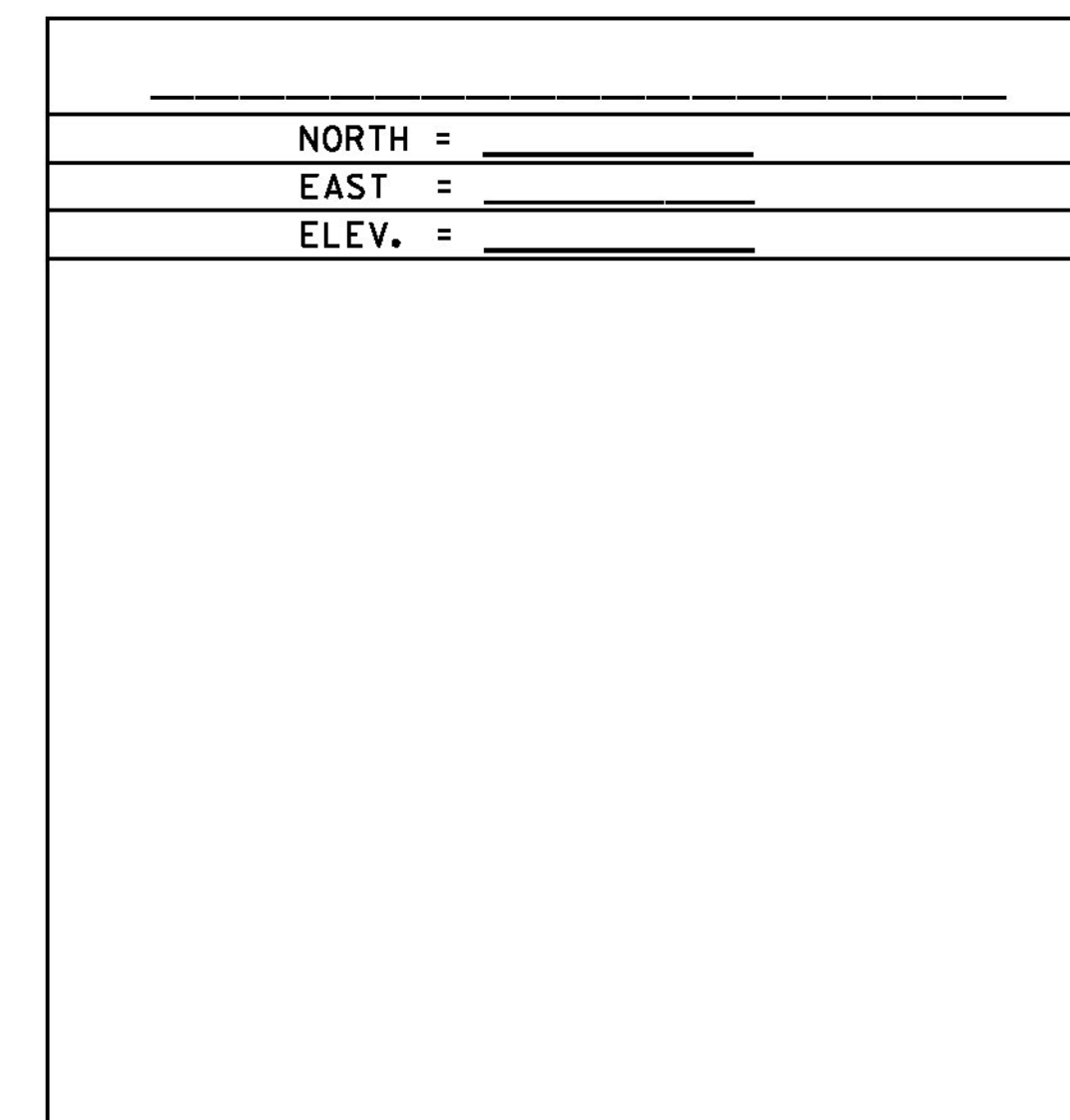
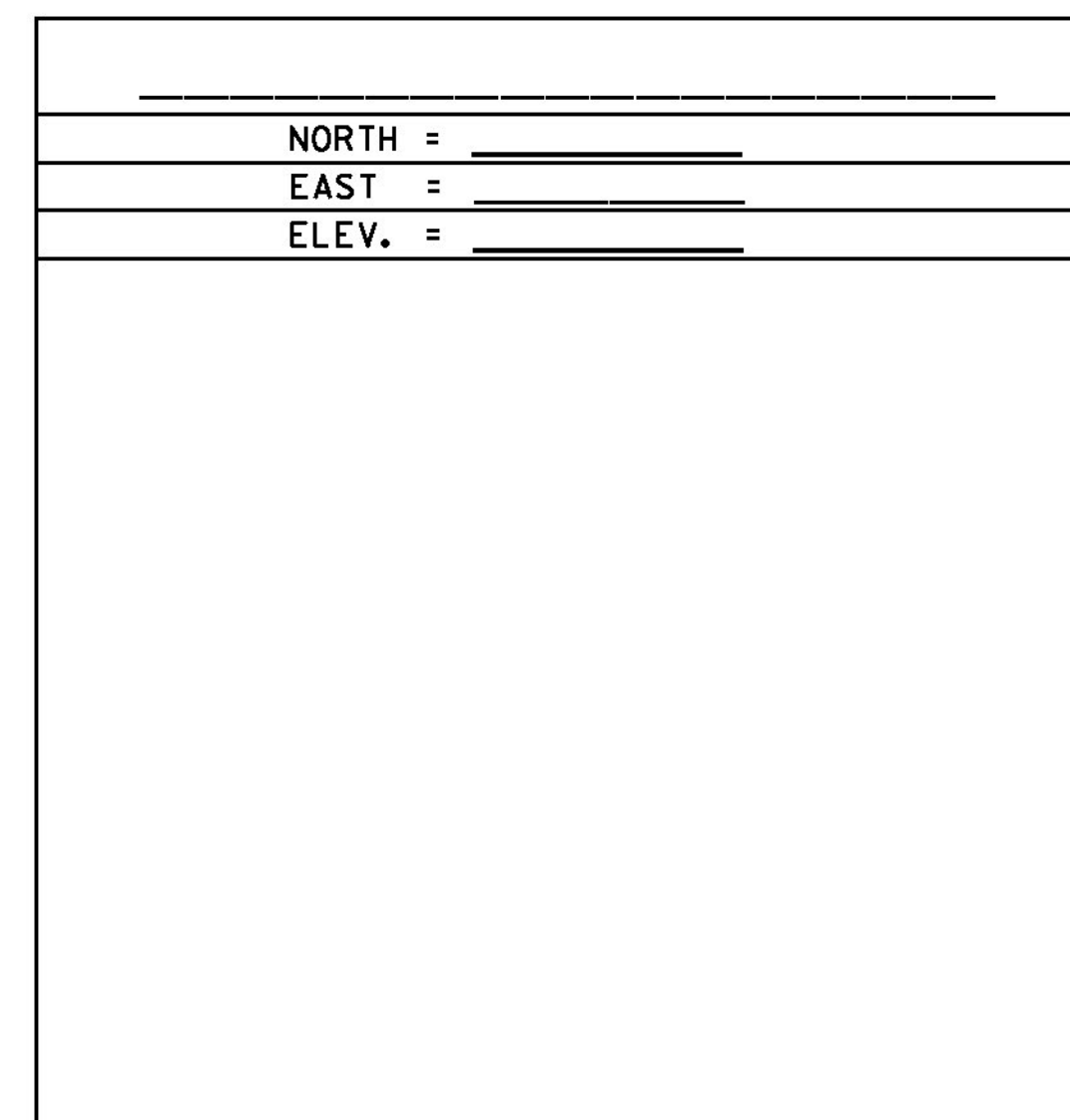
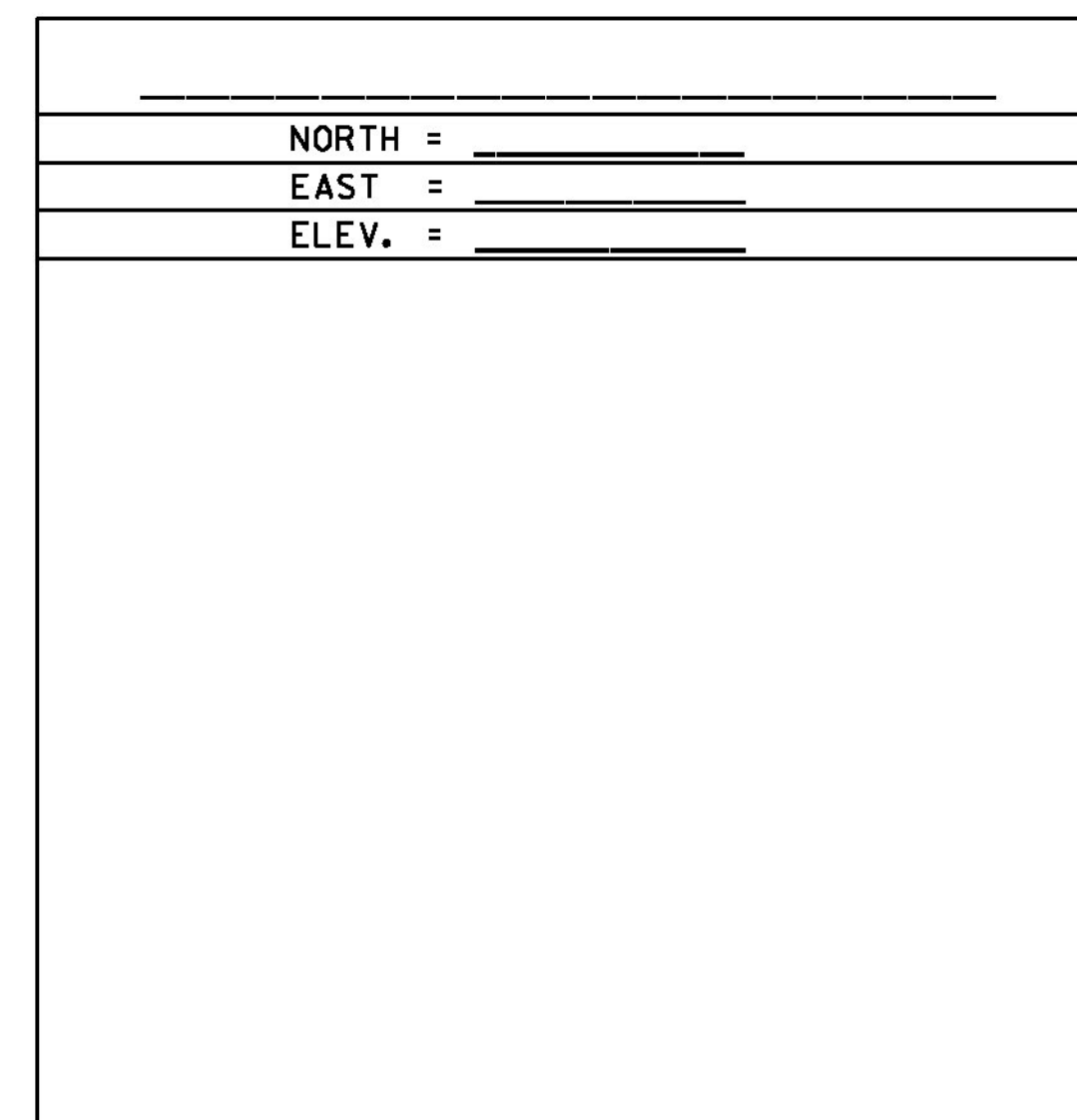
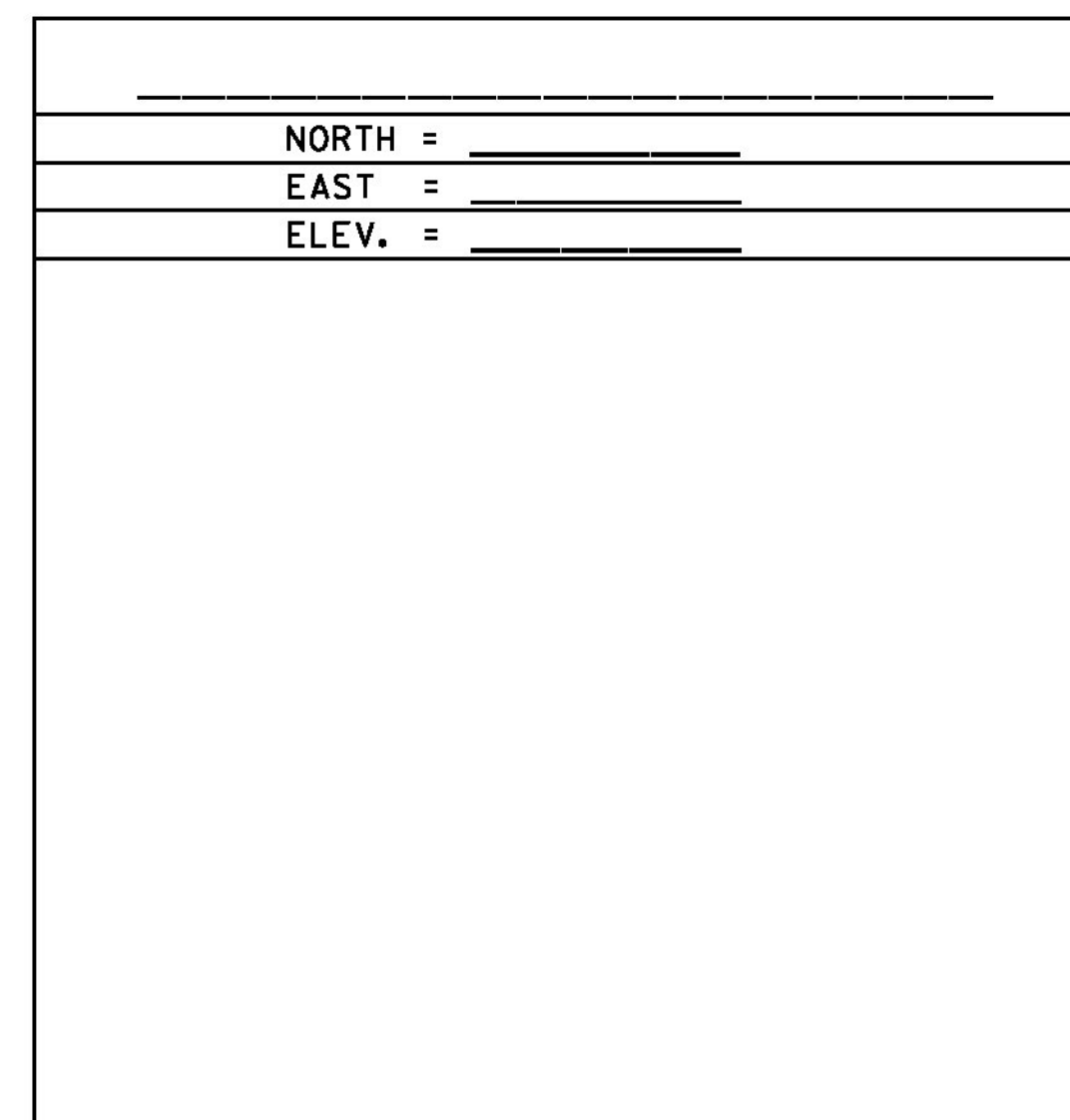
\* GPS CONTROL POINTS REFERENCED FROM PROJECT "FERRISBURG RAIL 5306(I) - #09GI28, 08/26/2009"

TRAVERSE TIES



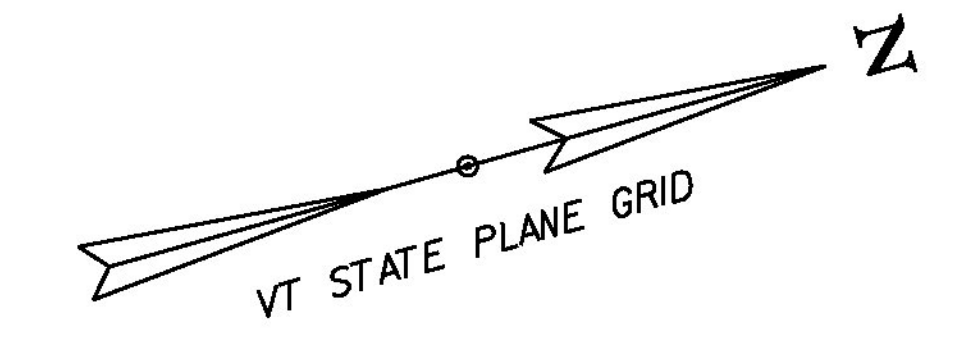
\* TRAVERSE COMPLETED BY: L. ORVIS P.C./ R. BOCKUS 8/26/2009, UPDATED 2/19/2013

ALIGNMENT TIES



DATUM  
 VERTICAL NAVD 88  
 HORIZONTAL NAD 83 (2007)  
 ADJUSTMENT COMPASS

PROJECT NAME: FERRISBURG  
 PROJECT NUMBER: NHG SCNL (42)  
 FILE NAME: I3b016\Survey\I3b016+1 PLOT DATE: 3/2/2016  
 PROJECT LEADER: I. DEGUTIS DRAWN BY: S. DONOVAN  
 DESIGNED BY: I. DEGUTIS CHECKED BY: P. BEYOR  
 TIE SHEET SHEET 5 OF 22



**SOIL CLASSIFICATION**

**AASHTO**

A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

**ROCK QUALITY DESIGNATION**

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

**SHEAR STRENGTH**

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

**CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY**

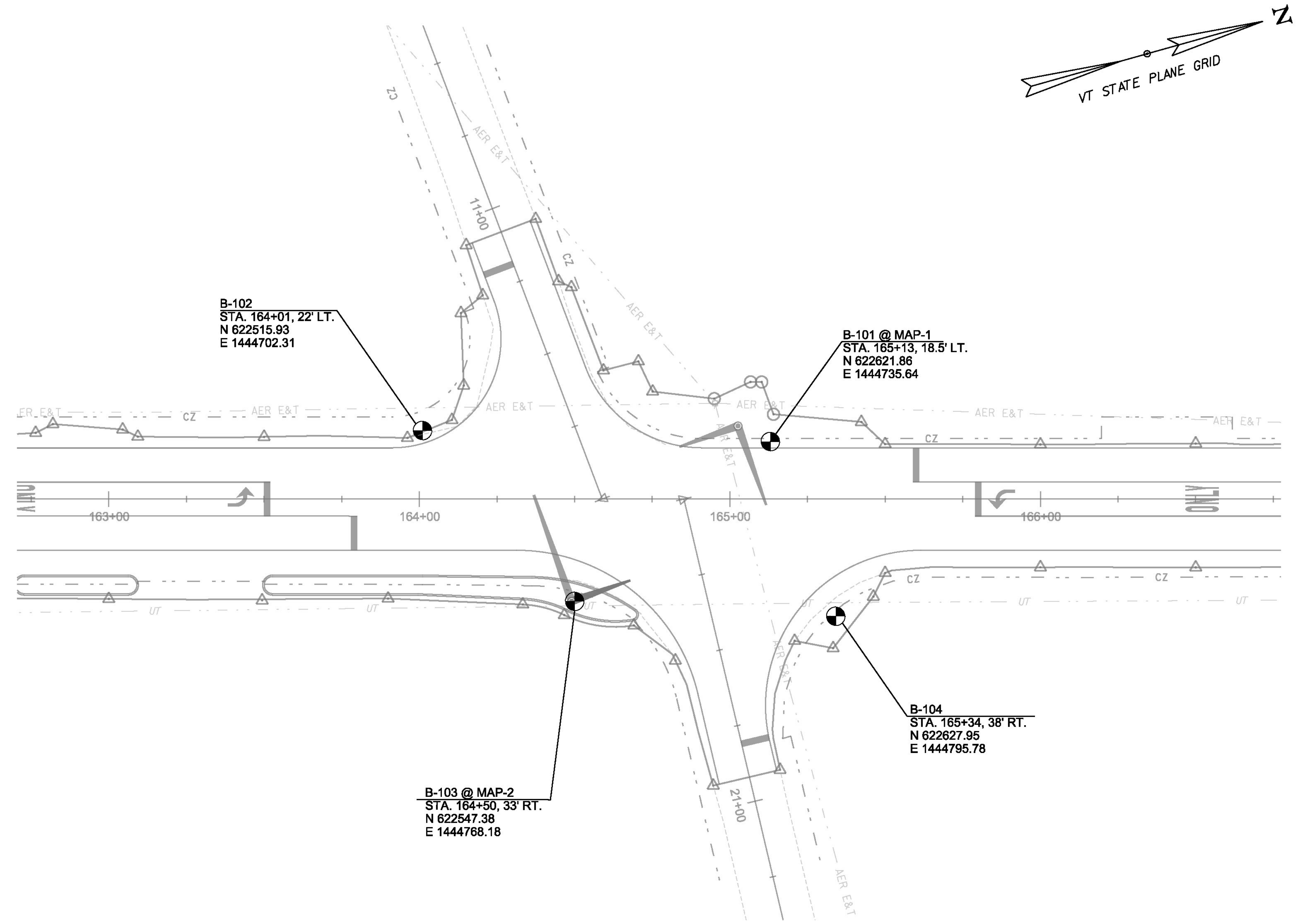
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**COMMONLY USED SYMBOLS**

▼	Water Elevation
⊕	Standard Penetration Boring
⊗	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O. D. Sampler 1 3/8" I. D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 3/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	Top of Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N 100) >
VTSPG	NAD83 - See Note 7

COLOR			
blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		



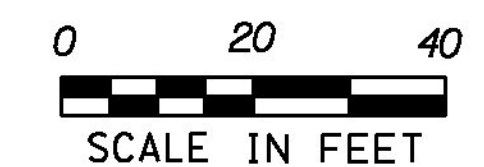
ID	LOCATION	NORTHING	EASTING
B-101	STA. 165+13, 18.5' LT	622621.86	1444735.86
B-102	STA. 164+01, 22' LT	622515.93	1444702.31
B-103	STA. 164+50, 33' RT	622547.38	1444768.18
B-104	STA. 165+34, 38' RT	622627.95	1444795.78

**DEFINITIONS (AASHTO)**

<b>BEDROCK (LEDGE)</b> - Rock in its native location of indefinite thickness.	<b>VARVED</b> - Alternate layers of silt and clay.
<b>BOULDER</b> - A rock fragment with an average dimension > 12 inches.	<b>HARDPAN</b> - Extremely dense soil, cemented layer, not softened when wet.
<b>COBBLE</b> - Rock fragments with an average dimension between 3 and 12 inches.	<b>MUCK</b> - Soft organic soil (containing > 10% organic material).
<b>GRAVEL</b> - Rounded particles of rock < 3" and > 0.075" (#10 sieve).	<b>MOISTURE CONTENT</b> - Weight of water divided by dry weight of soil.
<b>SAND</b> - Particles of rock < 0.075" (#10 sieve) and > 0.0029" (#200 sieve).	<b>FLOWING SAND</b> - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
<b>SILT</b> - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.	<b>STRIKE</b> - Angle from magnetic north to line of intersection of bed with a horizontal plane.
<b>CLAY</b> - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.	<b>DIP</b> - Inclination of bed with a horizontal plane.

**GENERAL NOTES**

- The subsurface explorations shown herein were made between 5/1/13 and 5/9/13 by the Agency.
- Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.
- Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.



PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

FILE NAME: +13b016frm.dgn PLOT DATE: 3/8/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: K. RECORD  
DESIGNED BY: I. DEGUTIS CHECKED BY: I. DEGUTIS  
BORING INFORMATION SHEET SHEET 6 OF 22

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-101</b>		
				FERRISBURGH NHG SGNL(42) US-7		Page No.: 1 of 1		
						Pin No.: 13B016		
						Checked By: MLM		
Boring Crew: GARROW, JUDKINS		Casing: WB		Sampler: SS		Groundwater Observations		
Date Started: 5/08/13 Date Finished: 5/08/13		I.D.: 4 in 1.5 in		Date: 05/08/13		Depth (ft): 4.6		
VTSPG NAD83: N 622621.86 ft E 1444735.64 ft		Hammer Wt: N.A. 140 lb.		Notes: While drilling.				
Station: 165+13 Offset: -18.50		Hammer Fall: N.A. 30 in.						
Ground Elevation: 228.0 ft		Hammer/Rod Type: Auto/AWJ						
		Rig: CME 55 TRACK		C <sub>r</sub> = 1.46				
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)		Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt Pavement, 0.0 ft - 0.7 ft						
		A-1-a, SaGr, gry, Dry, Rec. = 1.0 ft, Sample was mostly pulverized & broken rock.		13-30-21-21 (51)	1.4	68.2	23.4	8.4
		A-1-b, Sa, brn, Moist, Rec. = 0.9 ft		4-10-7-6 (17)	9.7	7.1	78.8	14.1
5		A-2-4, SiSa, brn, Moist, Rec. = 0.3 ft			15.5	17.7	51.9	30.4
		A-4, SaSi, brn, Moist, Rec. = 1.3 ft, Lab Note: A very thin layer of clay was noticeable.		4-1-5-11 (6)	12.4	19.3	39.3	41.4
		A-1-b, GrSa, brn, Wet, Rec. = 0.9 ft		2-2-7-11 (9)	14.1	37.5	51.0	11.5
10		A-2-4, GrSiSa, brn, MTW, Rec. = 1.3 ft		15-30-40-R (70)	9.4	26.1	41.7	32.2
		A-2-4, GrSiSa, brn, Moist, Rec. = 0.9 ft		30-R (R)	10.3	22.4	42.5	35.1
15		A-4, SaSi, brn-gry, Moist, Rec. = 0.8 ft		35-R (R)	12.9	13.0	28.5	58.5
20		Field Note: Cleaned out casing. Appears to be sandy silt						
		A-2-4, GrSiSa, gry, Moist, Rec. = 0.5 ft		45-R (R)	9.5	21.8	43.2	35.0
25		Field Note: NXDC, Boulder						
		A-2-4, SiSa, gry, MTW, Rec. = 1.1 ft		6-15-42-R (57)	16.2	11.6	66.8	21.6
Hole stopped @ 26.8 ft								
Remarks: Hole collapsed at 19.1 feet when casing was removed.								
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.								

BORING LOG 2 FERRISBURGH NHG SGNL(42).GPJ VERMONT AOT.GDT 5/23/13

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-102</b>		
				FERRISBURGH NHG SGNL(42) US-7		Page No.: 1 of 1		
						Pin No.: 13B016		
						Checked By: MLM		
Boring Crew: SALISBURY, DAIGNEAULT, JUDKINS		Casing: WB		Sampler: SS		Groundwater Observations		
Date Started: 5/09/13 Date Finished: 5/09/13		I.D.: 4 in 1.5 in		Date: 05/09/13		Depth (ft): 3.2		
VTSPG NAD83: N 622515.93 ft E 1444702.31 ft		Hammer Wt: N.A. 140 lb.		Notes: While drilling.				
Station: 164+01 Offset: -22.00		Hammer Fall: N.A. 30 in.						
Ground Elevation: 223.0 ft		Hammer/Rod Type: Auto/AWJ						
		Rig: CME 55 TRACK		C <sub>r</sub> = 1.46				
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)		Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-1-b, SaGr, Dk/brn, Moist, Rec. = 1.3 ft		4-7-6-7 (13)	5.4	48.9	41.8	9.3
		A-2-4, GrSiSa, Dk/brn, Moist, Rec. = 1.5 ft, Lab Note: A very thin layer of clay was noticeable.		8-17-11-6 (28)	13.1	22.8	48.6	28.6
5		A-4, SaSi, brn, MTW, Rec. = 1.3 ft, Lab Note: Broken Rock was within sample.		3-1-1-5 (2)	17.3	17.9	40.0	42.1
		A-4, GrSiSa, brn, Moist, Rec. = 1.6 ft, Lab Note: Broken Rock was within sample.		3-17-23-23 (40)	10.2	21.8	39.5	38.7
		A-4, GrSiSa, brn, Moist, Rec. = 1.2 ft		20-36-R (R)	9.7	27.9	36.4	35.7
10		A-4, SiSa, brn, Moist, Rec. = 1.0 ft		23-47-R (R)	10.1	18.0	43.8	38.2
15		A-2-4, GrSiSa, gry, Moist, Rec. = 0.5 ft		22-R (R)	8.8	27.7	42.4	29.9
20		A-4, GrSiSa, gry, MTW, Rec. = 0.7 ft		38-R (R)	10.6	21.5	41.4	37.1
25		A-2-4, SiSa, gry, MTW, Rec. = 0.8 ft		22-47-R (R)	11.6	7.6	61.6	30.8
Hole stopped @ 26.3 ft								
Remarks: Hole collapsed at 17.2 feet when casing was removed.								
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.								

BORING LOG 2 FERRISBURGH NHG SGNL(42).GPJ VERMONT AOT.GDT 5/23/13

PROJECT NAME:	FERRISBURGH
PROJECT NUMBER:	NHG SGNL(42)
FILE NAME:	+13b016frm.dgn
PROJECT LEADER:	I. DEGUTIS
DESIGNED BY:	I. DEGUTIS
BORING LOG SHEET I	
PLOT DATE:	3/2/2016
DRAWN BY:	I. DEGUTIS
CHECKED BY:	P. COBURN
SHEET	7 OF 22

VTTrans Working to Get You There STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-103</b>					
		FERRISBURGH NHG SGNL(42) US-7		Page No.: 1 of 1					
				Pin No.: 13B016					
				Checked By: MLM					
Boring Crew: SALISBURY, DAIGNEAULT, JUDKINS		Casing	Sampler	Groundwater Observations					
Date Started: 5/01/13	Date Finished: 5/01/13	Type: WB	SS	Date	Depth (ft)				
VTSPG NAD83: N 622547.38 ft E 1444768.18 ft		I.D.: 4 in	1.5 in	05/01/13	3.2				
Station: 164+50	Offset: 33.00	Hammer Wt: N.A.	140 lb.	Notes					
Ground Elevation: 225.0 ft		Hammer Fall: N.A.	30 in.	After drilling.					
		Hammer/Rod Type: Auto/AWJ							
		Rig: CME 55 TRACK	C <sub>s</sub> = 1.46						
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)			Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
5		A-1-b, SaGr, Dk/brn, Moist, Rec. = 0.9 ft			6-8-5-3 (13)	7.8	43.3	40.5	16.2
		A-1-b, SiGrSa, Dk/brn, Moist, Rec. = 0.3 ft			2-3-7-9 (10)	8.7	37.1	37.9	25.0
		A-4, GrSaSi, brn, Moist, Rec. = 0.3 ft				9.9	28.3	33.4	38.3
		A-4, GrSiSa, brn, Moist, Rec. = 1.4 ft			14-27-26-22 (53)	10.3	27.6	36.3	36.1
10		A-4, GrSiSa, brn, Moist, Rec. = 1.6 ft			27-30-38-R@1.0" (68)	9.7	20.6	42.6	36.8
		A-2-4, GrSiSa, brn, Moist, Rec. = 1.2 ft			21-30-R@5.0" (R)	9.9	24.1	41.9	34.0
		A-2-4, GrSiSa, brn, Moist, Rec. = 0.8 ft, Lab Note: Some Broken Rock was within sample.			38-R@3.5" (R)	9.4	24.0	41.6	34.4
		A-2-4, GrSiSa, gry, Moist, Rec. = 0.8 ft			25-48-R@2.5" (R)	9.3	26.0	43.0	31.0
15		A-4, SaSi, gry, Moist, Rec. = 1.0 ft			30-49-R@3.5" (R)	10.6	17.2	37.9	44.9
		A-2-4, SiGrSa, gry, Moist, Rec. = 0.8 ft			45-R@5.0" (R)	8.4	28.4	43.7	27.9
25		A-2-4, SiSa, gry, Moist, Rec. = 1.2 ft			21-38-R@2.5" (R)	12.3	7.0	57.6	35.4
		Hole stopped @ 26.2 ft							
Remarks: Hole collapsed at 19.5 feet when casing was removed.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.									

BORING LOG 2 FERRISBURGH NHG SGNL(42).GPJ VERMONT AOT.GDT 5/23/13

VTTrans Working to Get You There STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-104</b>					
		FERRISBURGH NHG SGNL(42) US-7		Page No.: 1 of 1					
				Pin No.: 13B016					
				Checked By: MLM					
Boring Crew: SALISBURY, DAIGNEAULT, JUDKINS		Casing	Sampler	Groundwater Observations					
Date Started: 5/03/13	Date Finished: 5/03/13	Type: WB	SS	Date	Depth (ft)				
VTSPG NAD83: N 622627.95 ft E 1444795.78 ft		I.D.: 4 in	1.5 in	05/03/13	3.0				
Station: 165+34	Offset: 38.00	Hammer Wt: N.A.	140 lb.	Notes					
Ground Elevation: 229.0 ft		Hammer Fall: N.A.	30 in.	While drilling.					
		Hammer/Rod Type: Auto/AWJ		05/03/13	5.1				
		Rig: CME 55 TRACK	C <sub>s</sub> = 1.46	Casing removed.					
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)			Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
5		A-2-4, SiGrSa, Dk/brn, Moist, Rec. = 1.2 ft			2-2-2-2 (4)	10.1	24.8	51.7	23.5
		A-4, GrSiSa, brn-rust, Wet, Rec. = 1.4 ft			1-1-1-3 (2)	17.6	21.4	40.5	38.1
		A-2-4, GrSiSa, Lt/brn, MTW, Rec. = 1.5 ft, Lab Note: A little Broken Rock was within sample.			7-16-22-29 (38)	10.2	29.7	35.9	34.4
		A-4, GrSiSa, Lt/brn, Moist, Rec. = 1.4 ft, Lab Note: Broken Rock was within sample.			17-31-39-R@1.0" (70)	9.6	20.6	42.0	37.4
10		A-2-4, SiGrSa, Lt/brn, Moist, Rec. = 0.8 ft			39-R@5.0" (R)	9.1	33.3	34.7	32.0
		A-2-4, GrSiSa, Lt/brn, Moist, Rec. = 0.4 ft, Lab Note: Broken Rock was within sample.			R@5.0" (R)	8.6	29.3	36.6	34.1
		A-2-4, GrSiSa, Dk/brn, Moist, Rec. = 0.3 ft			R@3.5" (R)	9.6	24.1	42.2	33.7
		A-2-4, Sa, gry, Moist, Rec. = 1.0 ft			42-47-R@1.0" (R)	11.8	13.2	72.1	14.7
25		A-4, SaSi (HP), Dk/gry, Wet, Rec. = 1.1 ft, Lab Note: A thin layer of Clay was noticeable.			36-42-R@2.5" (R)	12.2	4.7	35.0	60.3
		Hole stopped @ 26.2 ft							
Remarks: Hole collapsed at 21.5 feet when casing was removed.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.									

BORING LOG 2 FERRISBURGH NHG SGNL(42).GPJ VERMONT AOT.GDT 5/23/13

PROJECT NAME:	FERRISBURGH
PROJECT NUMBER:	NHG SGNL(42)
FILE NAME: +13b016frm.dgn	PLOT DATE: 3/2/2016
PROJECT LEADER: I. DEGUTIS	DRAWN BY: I. DEGUTIS
DESIGNED BY: I. DEGUTIS	CHECKED BY: P. COBURN
BORING LOG SHEET 2	SHEET 8 OF 22

# QUANTITY SHEET

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
								ROADWAY	EROSION CONTROL	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
								118			118		CY	COMMON EXCAVATION	203.15	5			
								1			1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	--			
								87			87		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	3			
								1			1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	--			
								365			365		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28	2			
								120			120		HR	UNIFORMED TRAFFIC OFFICERS	630.10	EST.			
								120			120		HR	FLAGGERS	630.15	EST.			
										1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16	--			
										1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17	--			
								1			1		LS	MOBILIZATION/DEMOBILIZATION	635.11	--			
								1			1		LS	TRAFFIC CONTROL	641.10	--			
								2			2		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15	--			
								3050			3050		LF	TEMPORARY 4 INCH WHITE LINE	646.600	31			
								3350			3350		LF	TEMPORARY 4 INCH YELLOW LINE	646.610	72			
								365			365		LF	TEMPORARY 8 INCH YELLOW LINE	646.650	5			
								65			65		LF	TEMPORARY 24 INCH STOP BAR	646.680	1			
								34			34		EACH	TEMPORARY LETTER OR SYMBOL	646.690	--			
								2000			2000		SF	REMOVAL OF EXISTING PAVEMENT MARKINGS	646.85	EST.			
									3		3		LB	SEED	651.15	0.9			
									20		20		LB	FERTILIZER	651.18	1			
									0.3		0.3		TON	AGRICULTURAL LIMESTONE	651.20	EST.			
									0.3		0.3		TON	HAY MULCH	651.25	EST.			
								14			14		CY	TOPSOIL	651.35	0.3			
								76			76		SF	TRAFFIC SIGNS, TYPE A	675.20	0.5			
								150			150		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	--			
								10			10		EACH	REMOVING SIGNS	675.50	--			
								1			1		EACH	TRAFFIC CONTROL SIGNAL SYSTEM, INTERSECTION	678.15	--			
								330			330		LF	ELECTRICAL CONDUIT (2")(SCH 80)	678.21	4			
								560			560		LF	WIRED CONDUIT (2")(SCH 80)	678.23	9			
								2			2		EACH	PULL BOX, STANDARD	678.25	--			
								1			1		EACH	PULL BOX, DOUBLE	678.27	--			
								2			2		EACH	LIGHT POLE BASE	679.21	--			
								2			2		EACH	BREAKAWAY FEATURE FOR LIGHT POLE	679.23	--			
								2			2		EACH	LIGHT POLE	679.45	--			
								3			3		EACH	BRACKET ARM	679.47	--			
								3			3		EACH	SPECIAL PROVISION (LUMINAIRE, LED)	900.620	--			
								140			140		LF	SPECIAL PROVISION (HORIZONTAL DIRECTIONAL DRILLING)(12" CASING PIPE)	900.640	3			
								15			15		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	1			
								0.3			0.3		CWT	SPECIAL PROVISION (EMULSIFIED ASPHALT)(RS-1H OR CRS-1H)	900.683	EST.			

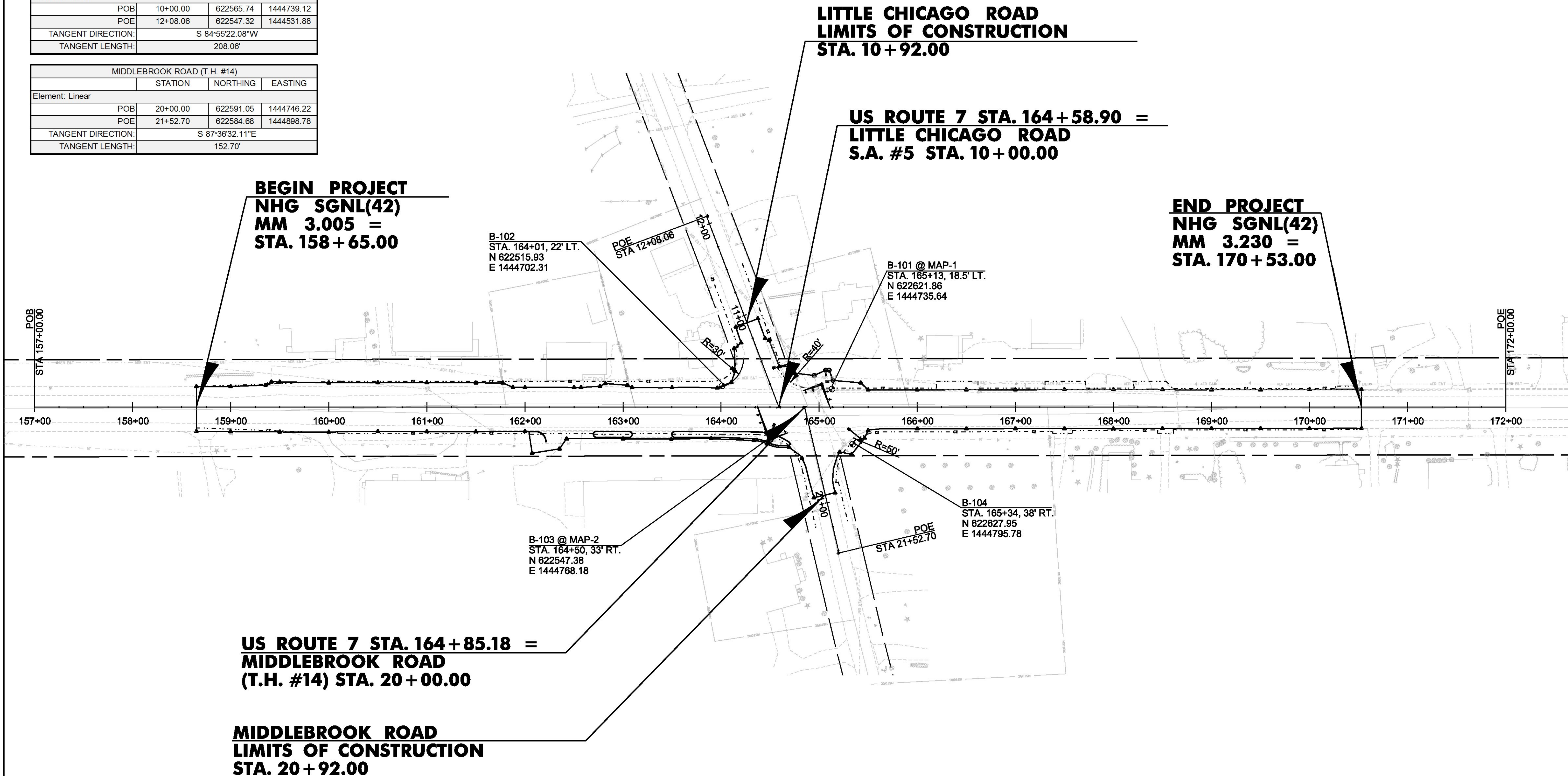
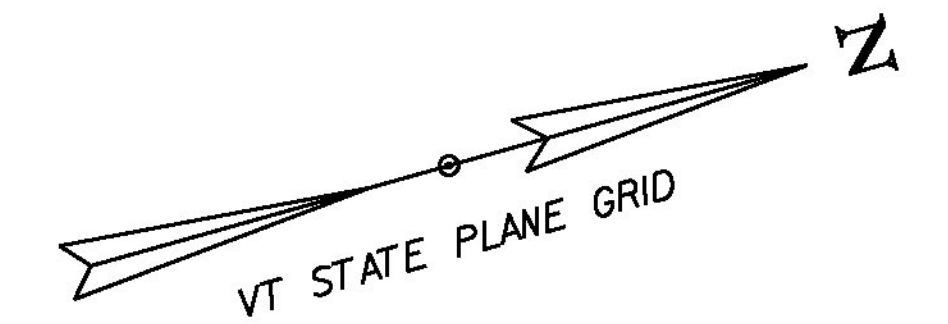
PROJECT NAME: FERRISBURGH  
 PROJECT NUMBER: NHG SCNL(42)  
 FILE NAME: +13b016frm.dgn PLOT DATE: 3/22/2016  
 PROJECT LEADER: I. DEGUTIS DRAWN BY: K. RECORD  
 DESIGNED BY: K. RECORD CHECKED BY: I. DEGUTIS  
 QUANTITY SHEET 1 SHEET 9 OF 22

US ROUTE 7			
	STATION	NORTHING	EASTING
Element: Linear			
POB	157+00.00	621835.00	1444534.29
POE	172+00.00	623279.33	1444939.15
TANGENT DIRECTION:	N 15°39'32.04"E		
TANGENT LENGTH:	1500.00'		

LITTLE CHICAGO ROAD (T.H. #5)			
	STATION	NORTHING	EASTING
Element: Linear			
POB	10+00.00	622565.74	1444739.12
POE	12+08.06	622547.32	1444531.88
TANGENT DIRECTION:	S 84°55'22.08"W		
TANGENT LENGTH:	208.06'		

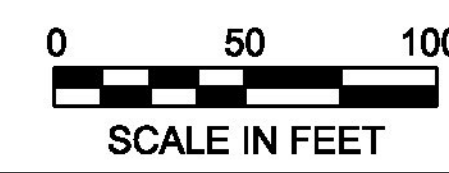
MIDDLEBROOK ROAD (T.H. #14)			
	STATION	NORTHING	EASTING
Element: Linear			
POB	20+00.00	622591.05	1444746.22
POE	21+52.70	622584.68	1444898.78
TANGENT DIRECTION:	S 87°36'32.11"E		
TANGENT LENGTH:	152.70'		

CAST-IN-PLACE CURB, TYPE B  
SEE CURBING PLAN SHEET FOR MORE INFORMATION

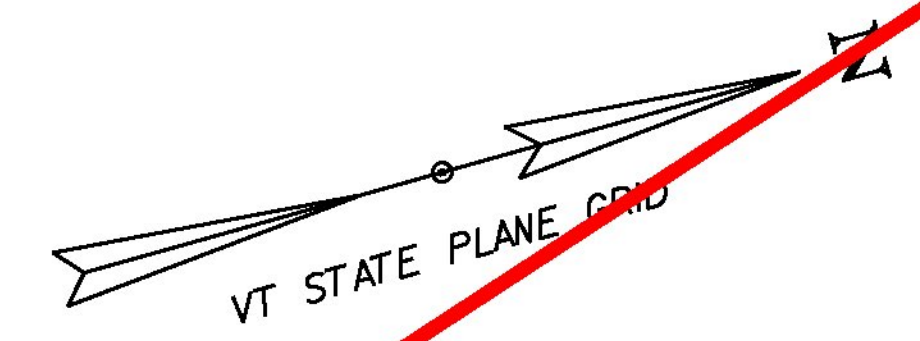


DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83 (2007)

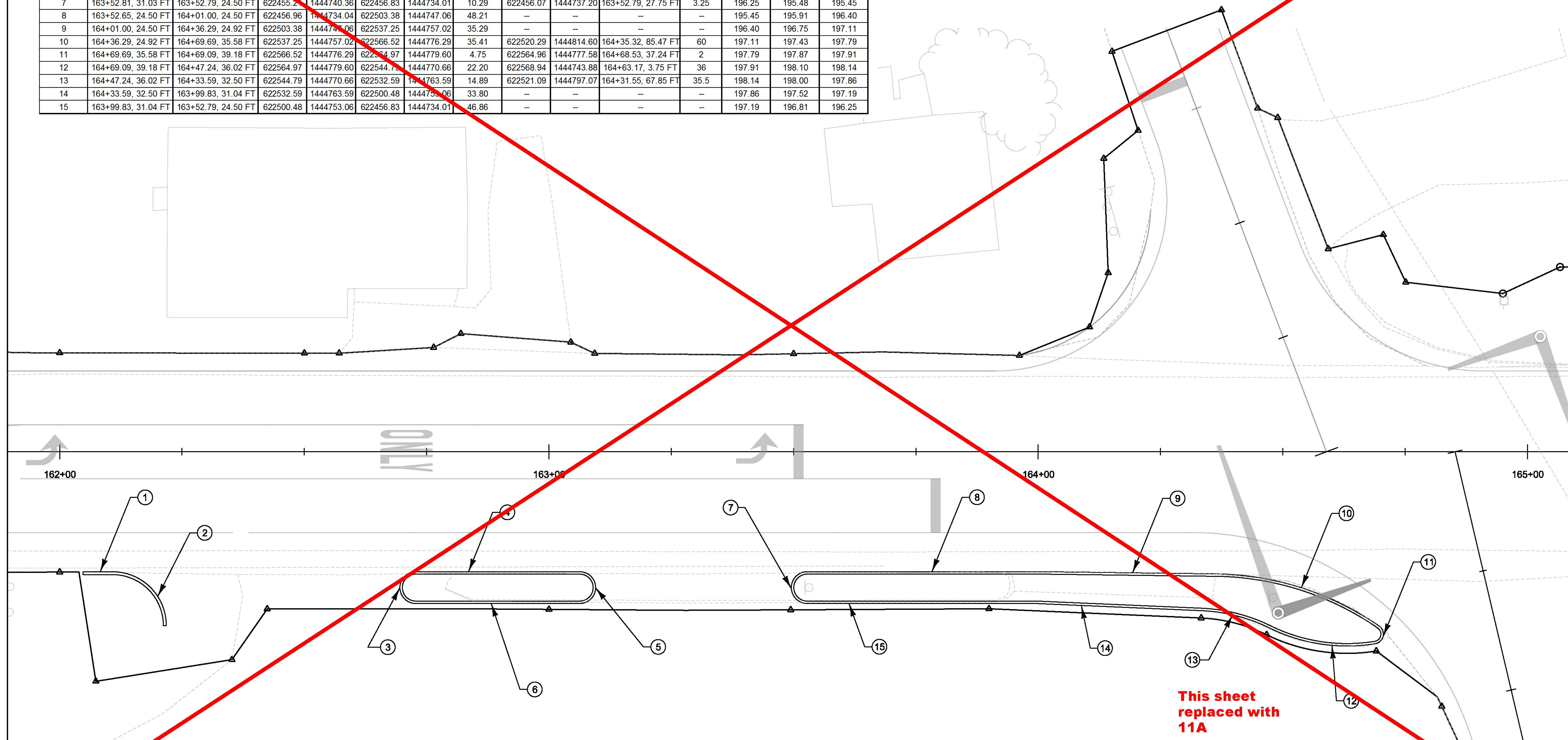
PROJECT NAME:	FERRISBURGH	PLOT DATE:	3/2/2016
PROJECT NUMBER:	NHG SGNL(42)	PROJECT LEADER:	I. DEGUTIS
FILE NAME:	+13b016nu1.dgn	DESIGNED BY:	I. DEGUTIS
DESIGNED BY:	I. DEGUTIS	CHECKED BY:	P. COBURN
PLAN SHEET		SHEET	10 OF 22



CAST - IN - PLACE CONCRETE CURB, TYPE B  
SEE TABLE, THIS SHEET

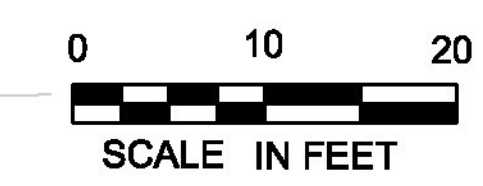


CAST - IN - PLACE CONCRETE CURB, TYPE B														
CURB ID	STATION		BEGIN LOCATION		END LOCATION		LENGTH (FT)	RADI CENTER POINT LOCATION			RADIUS (FT)	GUTTER LINE ELEVATION (FT)		
	BEGIN	END	NORTHING	EASTING	NORTHING	EASTING		NORTHING	EASTING	STATION		BEGIN	MIDPOINT	END
1	162+04.79, 24.50 FT	162+10.79, 24.50 FT	622314.44	1444694.12	622320.22	1444695.74	6.0	-	-	-	-	193.13	193.19	193.24
2	162+10.79, 24.50 FT	162+27.79, 35.50 FT	622320.22	1444695.74	622327.84	1444709.30	17.32	622317.25	1444706.34	162+04.79, 35.50 FT	11	193.24	194.03	194.54
3	162+72.79, 31.03 FT	162+72.79, 34.50 FT	622378.16	1444718.76	622379.93	1444712.45	10.29	622379.04	1444715.61	162+72.79, 27.75 FT	3.25	194.77	194.43	194.09
4	162+72.79, 24.50 FT	163+06.29, 24.50 FT	622379.93	1444712.45	622412.18	1444721.49	33.50	-	-	-	-	194.09	194.45	194.77
5	163+06.29, 24.50 FT	163+06.29, 31.03 FT	622412.18	1444721.49	622410.41	1444727.81	10.29	622411.30	1444724.65	163+06.29, 27.75 FT	3.25	194.77	195.10	195.43
6	163+06.29, 31.03 FT	162+72.79, 31.03 FT	622378.16	1444718.76	622410.41	1444727.81	33.50	-	-	-	-	195.43	195.15	194.77
7	163+52.81, 31.03 FT	163+52.79, 24.50 FT	622455.22	1444740.36	622456.83	1444734.01	10.29	622456.07	1444737.20	163+52.79, 27.75 FT	3.25	196.25	195.48	195.45
8	163+52.65, 24.50 FT	164+01.00, 24.50 FT	622456.96	1444734.04	622503.38	1444747.06	48.21	-	-	-	-	195.45	195.91	196.40
9	164+01.00, 24.50 FT	164+36.29, 24.92 FT	622503.38	1444747.06	622537.25	1444757.02	35.29	-	-	-	-	196.40	196.75	197.11
10	164+36.29, 24.92 FT	164+69.69, 35.58 FT	622537.25	1444757.02	622566.52	1444776.29	35.41	622520.29	1444814.60	164+35.32, 85.47 FT	60	197.11	197.43	197.79
11	164+69.69, 35.58 FT	164+69.09, 39.18 FT	622566.52	1444776.29	622574.97	1444779.60	4.75	622564.96	1444777.58	164+68.53, 37.24 FT	2	197.79	197.87	197.91
12	164+69.09, 39.18 FT	164+47.24, 36.02 FT	622564.97	1444779.60	622544.71	1444770.66	22.20	622568.94	1444743.88	164+63.17, 3.75 FT	36	197.91	198.10	198.14
13	164+47.24, 36.02 FT	164+33.59, 32.50 FT	622544.71	1444770.66	622532.59	1444763.59	14.89	622521.09	1444797.07	164+31.55, 67.85 FT	35.5	198.14	198.00	197.86
14	164+33.59, 32.50 FT	163+99.83, 31.04 FT	622532.59	1444763.59	622500.48	1444753.06	33.80	-	-	-	-	197.86	197.52	197.19
15	163+99.83, 31.04 FT	163+52.79, 24.50 FT	622500.48	1444753.06	622456.83	1444734.01	46.86	-	-	-	-	197.19	196.81	196.25

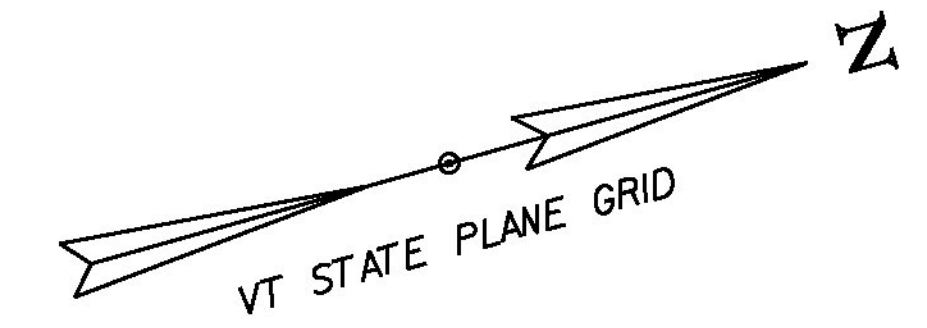


This sheet replaced with 11A

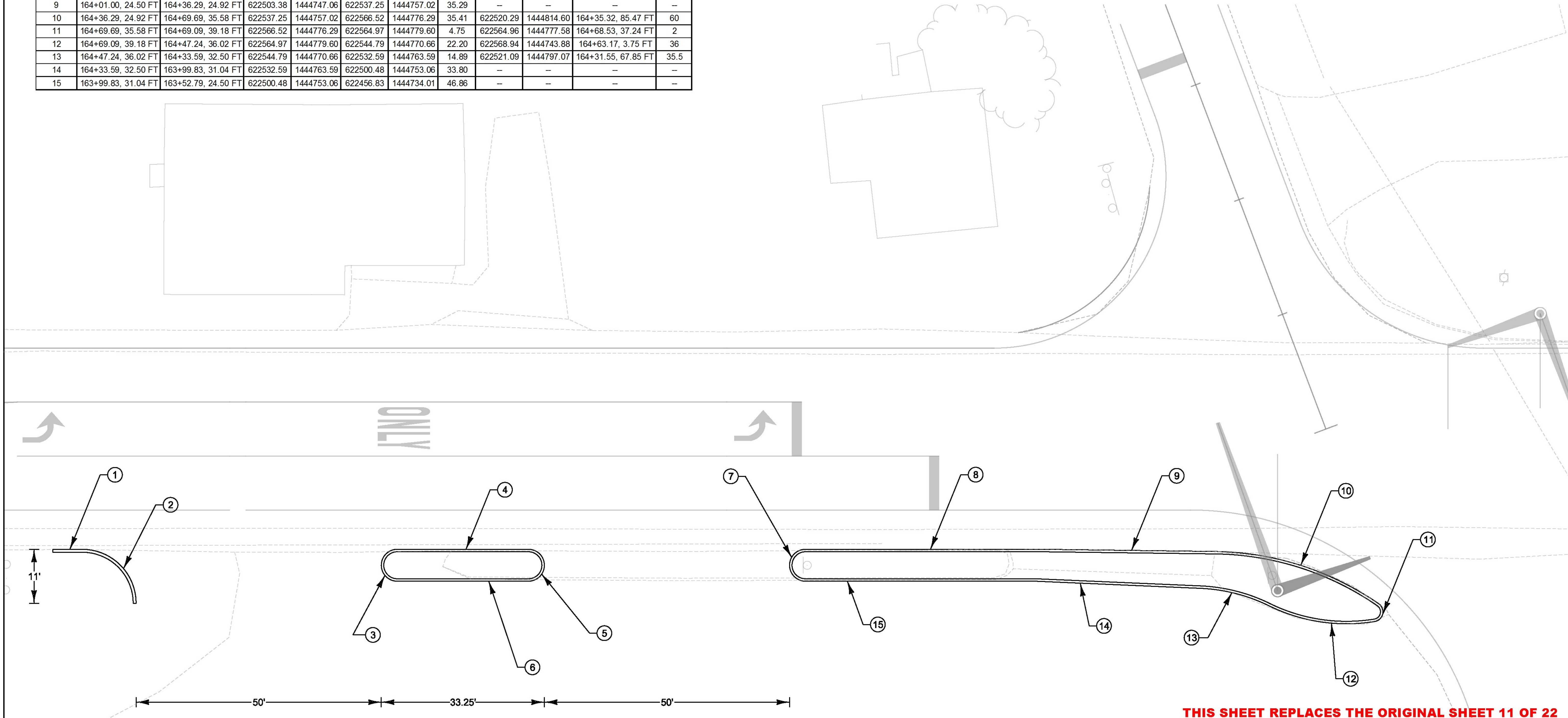
PROJECT NAME: FERRISBURGH  
 PROJECT NUMBER: NHG SCNL(42)  
 FILE NAME: +13b016crb.dgn PLOT DATE: 3/2/2016  
 PROJECT LEADER: I. DEGUTIS DRAWN BY: K. RECORD  
 DESIGNED BY: I. DEGUTIS CHECKED BY: I. DEGUTIS  
 CURBING PLAN SHEET SHEET II OF 22



CAST - IN - PLACE CONCRETE CURB, TYPE B  
SEE TABLE, THIS SHEET

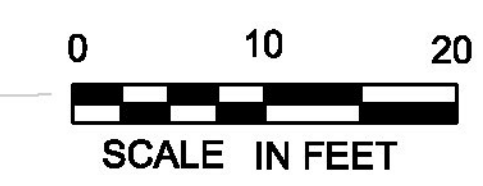


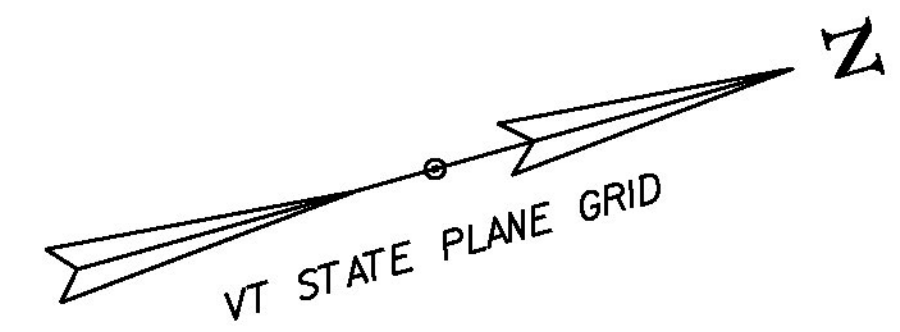
CURB ID	STATION		BEGIN LOCATION		END LOCATION		LENGTH (FT)	RADI CENTER POINT LOCATION			RADIUS (FT)
	BEGIN	END	NORTHING	EASTING	NORTHING	EASTING		NORTHING	EASTING	STATION	
1	161+99.29, 24.50 FT	162+05.29, 24.50 FT	622309.15	1444692.64	622314.93	1444694.26	6.0	-	-	-	-
2	162+05.29, 24.50 FT	162+16.29, 35.50 FT	622314.93	1444694.26	622322.55	1444707.82	17.32	622311.95	1444704.85	162+05.29, 35.50 FT	11
3	162+69.54, 31.00 FT	162+69.54, 24.50 FT	622375.03	1444717.86	622376.79	1444711.60	10.29	622375.91	1444714.73	162+69.54, 27.75 FT	3.25
4	162+69.54, 24.50 FT	162+96.29, 24.50 FT	622376.79	1444711.60	622402.55	1444718.82	26.75	-	-	-	-
5	162+96.29, 24.50 FT	162+96.29, 31.00 FT	622402.55	1444718.82	622400.79	1444725.08	10.29	622401.67	1444721.95	162+96.29, 27.75 FT	3.25
6	162+96.29, 31.00 FT	162+69.54, 31.00 FT	622400.79	1444725.08	622375.03	1444717.86	26.75	-	-	-	-
7	163+52.81, 31.03 FT	163+52.79, 24.50 FT	622455.21	1444740.36	622456.83	1444734.01	10.29	622456.07	1444737.20	163+52.79, 27.75 FT	3.25
8	163+52.65, 24.50 FT	164+01.00, 24.50 FT	622456.96	1444734.04	622503.38	1444747.06	48.21	-	-	-	-
9	164+01.00, 24.50 FT	164+36.29, 24.92 FT	622503.38	1444747.06	622537.25	1444757.02	35.29	-	-	-	-
10	164+36.29, 24.92 FT	164+69.69, 35.58 FT	622537.25	1444757.02	622566.52	1444776.29	35.41	622520.29	1444814.60	164+35.32, 85.47 FT	60
11	164+69.69, 35.58 FT	164+69.09, 39.18 FT	622566.52	1444776.29	622564.97	1444779.60	4.75	622564.96	1444777.58	164+68.53, 37.24 FT	2
12	164+69.09, 39.18 FT	164+47.24, 36.02 FT	622564.97	1444779.60	622544.79	1444770.66	22.20	622568.94	1444743.88	164+63.17, 3.75 FT	36
13	164+47.24, 36.02 FT	164+33.59, 32.50 FT	622544.79	1444770.66	622532.59	1444763.59	14.89	622521.09	1444797.07	164+31.55, 67.85 FT	35.5
14	164+33.59, 32.50 FT	163+99.83, 31.04 FT	622532.59	1444763.59	622500.48	1444753.06	33.80	-	-	-	-
15	163+99.83, 31.04 FT	163+52.79, 24.50 FT	622500.48	1444753.06	622456.83	1444734.01	46.86	-	-	-	-



**THIS SHEET REPLACES THE ORIGINAL SHEET 11 OF 22**

PROJECT NAME:	FERRISBURGH	PLOT DATE:	8/11/2016
PROJECT NUMBER:	NHG SCNL(42)	DRAWN BY:	K. RECORD
FILE NAME:	+13b016crb.dgn	DESIGNED BY:	I. DEGUTIS
PROJECT LEADER:	I. DEGUTIS	CHECKED BY:	I. DEGUTIS
DESIGNED BY:	I. DEGUTIS	CURBING PLAN SHEET	SHEET 11A OF 22





- TEMPORARY 4 INCH WHITE LINE**
- (A1) STA. 158+65.00, LT. - STA. 10+92.00, LT. (SOLID) (614')
  - (A2) STA. 158+65.00, RT. - STA. 20+92.00, RT. (SOLID) (677')
  - (A3) STA. 160+12.00, RT. - STA. 161+92.00, RT. (DOTTED) (60')
  - (A4) STA. 161+92.00, RT. - STA. 163+80.00, RT. (SOLID) (188')
  - (A5) STA. 20+92.00, LT. - STA. 170+53.00, RT. (SOLID) (592')
  - (A6) STA. 10+92.00, RT. - STA. 170+53.00, LT. (SOLID) (719')
  - (A7) STA. 165+59.00, LT. - STA. 167+26.00, LT. (SOLID) (167')
  - (A8) STA. 167+26.00, LT. - STA. 169+06.00, LT. (DOTTED) (60')

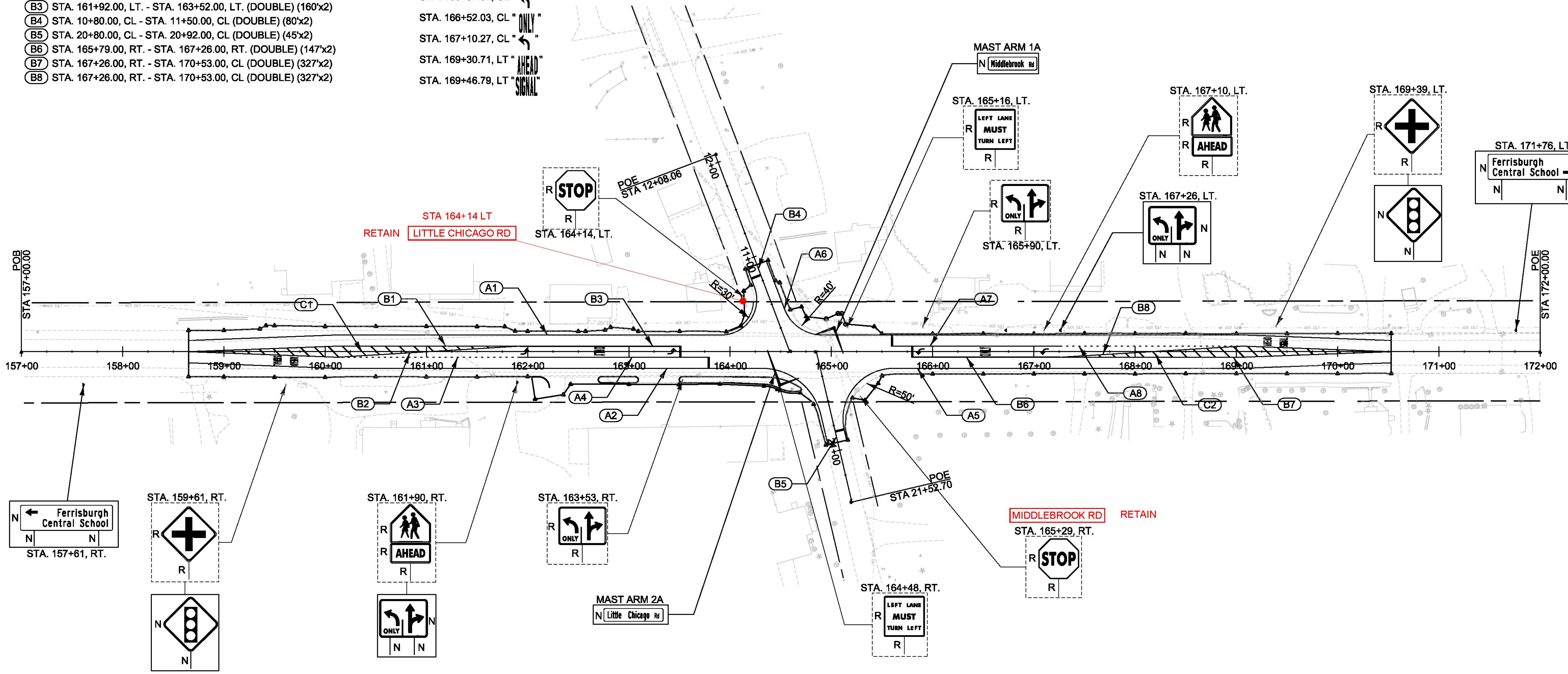
- TEMPORARY 4 INCH YELLOW LINE**
- (B1) STA. 158+65.00, CL - STA. 161+92.00, LT. (DOUBLE) (327'x2)
  - (B2) STA. 158+65.00, CL - STA. 161+92.00, LT. (DOUBLE) (327'x2)
  - (B3) STA. 161+92.00, LT. - STA. 163+52.00, LT. (DOUBLE) (160'x2)
  - (B4) STA. 10+80.00, CL - STA. 11+50.00, CL (DOUBLE) (80'x2)
  - (B5) STA. 20+80.00, CL - STA. 20+92.00, CL (DOUBLE) (45'x2)
  - (B6) STA. 165+79.00, RT. - STA. 167+26.00, RT. (DOUBLE) (147'x2)
  - (B7) STA. 167+26.00, RT. - STA. 170+53.00, CL (DOUBLE) (327'x2)
  - (B8) STA. 167+26.00, RT. - STA. 170+53.00, CL (DOUBLE) (327'x2)

- TEMPORARY 8 INCH YELLOW LINE**
- (C1) STA. 158+65.00 - STA. 161+92.00 (DIAGONALS) (180')
  - (C2) STA. 167+26.00 - STA. 170+53.00 (DIAGONALS) (180')

- TEMPORARY LETTER OR SYMBOL**
- STA. 159+52.98, RT "SIGNAL AHEAD"
  - STA. 159+69.43, RT " "
  - STA. 161+97.49, CL " "
  - STA. 162+70.95, CL " ONLY "
  - STA. 163+40.79, CL " "
  - STA. 165+87.52, CL " "
  - STA. 166+52.03, CL " ONLY "
  - STA. 167+10.27, CL " "
  - STA. 169+30.71, LT " AHEAD SIGNAL "
  - STA. 169+46.79, LT " AHEAD SIGNAL "

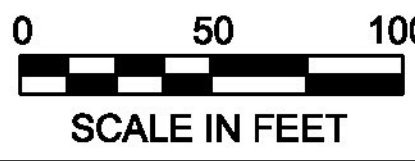
- TEMPORARY 24 INCH STOP BAR**
- STA 163+52.00, CL (11')
  - STA 163+80.00, RT (11')
  - STA 10+80.00, LT (10')
  - STA 20+80.00, LT (10')
  - STA 165+59.00, CL (11')
  - STA 165+79.00, LT (11')

- TRAFFIC SIGNS, TYPE A**  
SEE TRAFFIC SIGN SUMMARY SHEET
- SQUARE TUBE SIGN POST AND ANCHOR**  
SEE TRAFFIC SIGN SUMMARY SHEET
- REMOVING SIGNS**  
AS SHOWN - 10

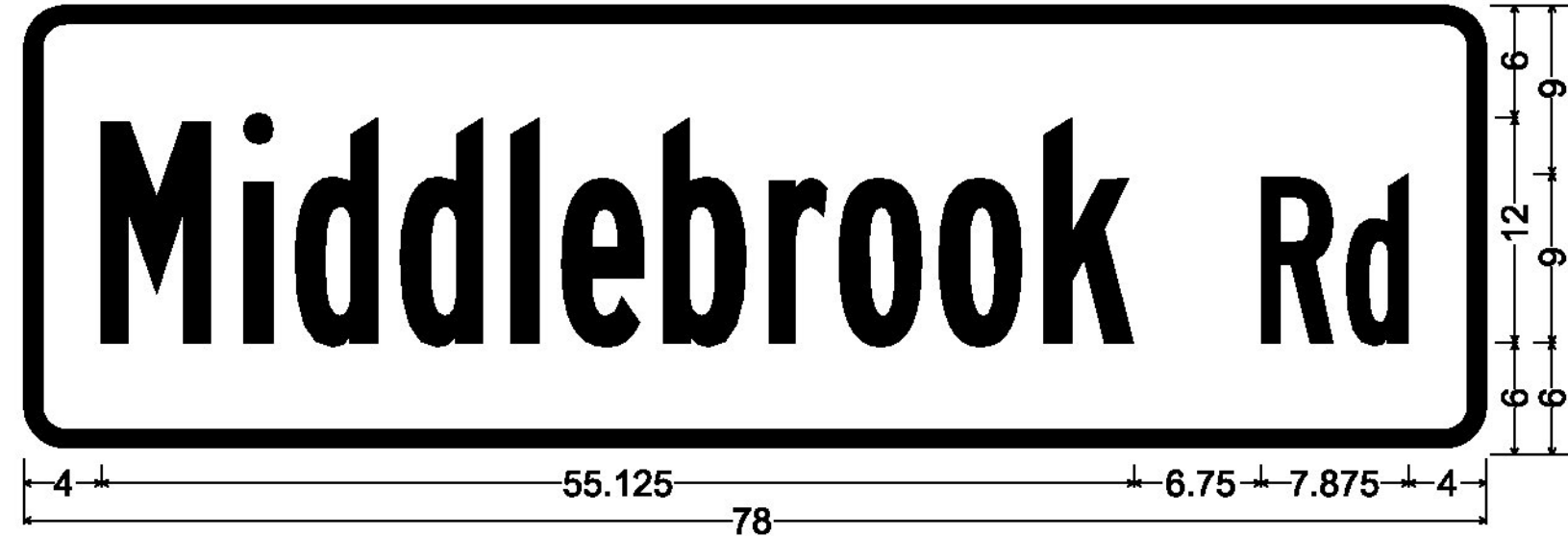


**LEGEND**  
R REMOVE  
N NEW

PROJECT NAME:	FERRISBURGH
PROJECT NUMBER:	NHG SCNL(42)
FILE NAME:	+13b016nu1.dgn
PROJECT LEADER:	I. DEGUTIS
DESIGNED BY:	I. DEGUTIS
TRAFFIC SIGNS SHEET	
PLOT DATE:	3/2/2016
DRAWN BY:	I. DEGUTIS
CHECKED BY:	P. COBURN
SHEET	12 OF 22







2.250" Radius, 1.000" Border, White on Green;  
 [Middlebrook Rd] B 2K 75) spacing;

D3-1

SIGN TOO LARGE FOR  
 MAST ARM PROVIDED  
 TO DISTRICT #5

SIGN IS DOUBLE-SIDED, 0.125" FLAT ALUMINUM

MAST ARM MOUNTING BRACKET AND HARDWARE WILL  
 BE CONSIDERED INCIDENTAL TO ITEM 675.20 TRAFFIC  
 SIGNS, TYPE A FOR THIS OVERHEAD ASSEMBLY



2.250" Radius, 1.000" Border, White on Green;  
 [Little Chicago Rd] B 2K 75) spacing;

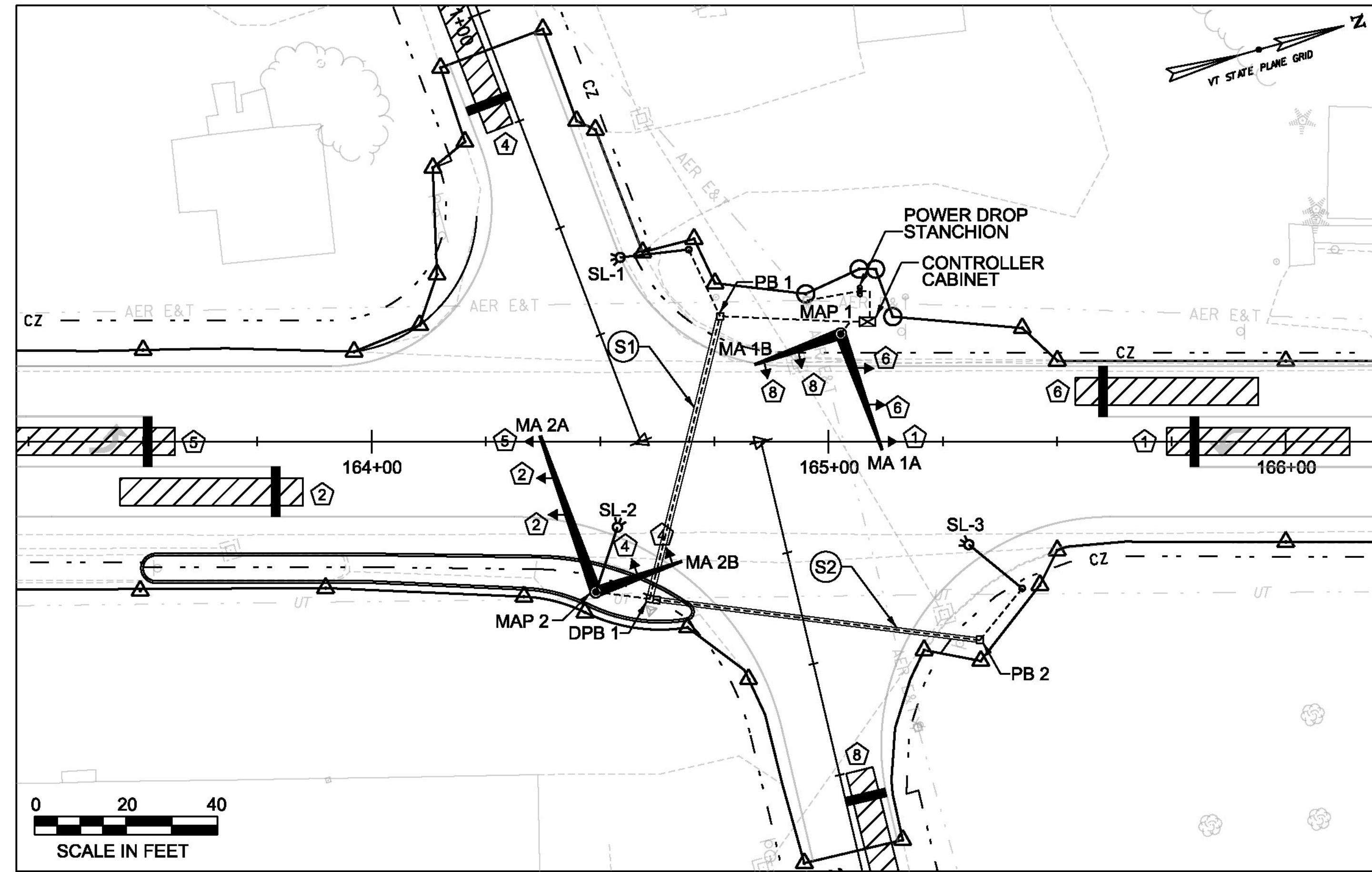
D3-1

SIGN TOO LARGE FOR  
 MAST ARM PROVIDED  
 TO DISTRICT #5

SIGN IS DOUBLE-SIDED, 0.125" FLAT ALUMINUM

MAST ARM MOUNTING BRACKET AND HARDWARE WILL  
 BE CONSIDERED INCIDENTAL TO ITEM 675.20 TRAFFIC  
 SIGNS, TYPE A FOR THIS OVERHEAD ASSEMBLY

PROJECT NAME:	FERRISBURGH
PROJECT NUMBER:	NHG SCNL(42)
FILE NAME: +13b016signdetail.dgn	PLOT DATE: 3/2/2016
PROJECT LEADER: I. DEGUTIS	DRAWN BY: K. RECORD
DESIGNED BY: K. RECORD	CHECKED BY: I. DEGUTIS
TRAFFIC SIGN DETAIL SHEET	SHEET 14 OF 22



### CONTROLLER TIMING CHART

PHASE	1	2	3	4	5	6	7	8	9
IN USE	X	X		X	X	X		X	
TRAFFIC MOVEMENT	← →	← →	← →	← →	← →	← →	← →	← →	← →
MIN. GREEN	5	8		5	5	8		5	
MAX 2 - GREEN (AM)	9	40		14	14	40		12	
MAX 1 - GREEN (OFF)	9	37		13	9	37		12	
MAX 3 - GREEN (PM)	9	52		12	9	52		12	
YELLOW CLEARANCE	4.4	4.4		4.1	4.4	4.4		3.7	
ALL RED CLEARANCE	1.9	1.9		1.9	1.9	1.9		2.5	
VEHICLE EXTENSION	3	3		3	3	3		3	
RECALL MODE		SOFT				SOFT			

CYCLE LENGTH	PHASE							
	1	2	3	4	5	6	7	8
SPLIT PATTERN 1	94	15	42	19	15	42	18	18
SPLIT PATTERN 2	98	15	46	19	20	41	18	18
SPLIT PATTERN 3	109	15	58	18	15	58	18	18
SPLIT PATTERN 4	103	15	46	24	20	41	18	18

### TIME OF DAY PROGRAM

FLASH	WEEKDAY TIMINGS	
	TO	TO
FLASH	12:00 AM	6:00 AM
SPLIT PATTERN 2	6:00 AM	7:30 AM
SPLIT PATTERN 4	7:30 AM	8:00 AM
SPLIT PATTERN 2	8:00 AM	9:00 AM
SPLIT PATTERN 1	9:00 AM	2:45 PM
SPLIT PATTERN 4	2:45 PM	3:15 PM
SPLIT PATTERN 3	3:15 PM	6:00 PM
SPLIT PATTERN 1	6:00 PM	10:00 PM
FLASH	10:00 PM	12:00 AM

**TRAFFIC CONTROL SIGNAL SYSTEM, INTERSECTION**  
SEE LIST OF MAJOR EQUIPMENT, THIS SHEET

**CONSTRUCT MAST ARM POLES**  
STA. 164+49, RT (MAP2)  
STA. 165+03, LT (MAP1)

**CONSTRUCT CONTROLLER CABINET (GROUND-MOUNTED)**  
STA. 165+09, LT

**WIRED CONDUIT (2" (SCH 80))**  
SEE CHART, THIS SHEET

**SPECIAL PROVISION (HORIZONTAL DIRECTIONAL DRILLING) (12" CASING PIPE)**  
STA. 164+61, LT (DPB-1) - STA. 164+76, RT (PB-1) - 70'  
STA. 164+61, LT (DPB-1) - STA. 165+33, RT (PB-2) - 83'

**ELECTRICAL CONDUIT (2" (SCH 80))**  
SEE CHART, THIS SHEET

**PULLBOX, STANDARD**  
STA. 164+76, LT (PB-1)  
STA. 165+33, RT (PB-2)

**PULLBOX, DOUBLE**  
STA. 164+61, RT (DPB-1)

**LIGHT POLE**  
STA. 164+69, LT (SL-1)  
STA. 165+42, RT (SL-3)

**BREAKAWAY FEATURE FOR LIGHT POLE**  
STA. 164+69, LT (SL-1)  
STA. 165+42, RT (SL-3)

**BRACKET ARM**  
MAP-2 (SL-2)  
STA. 164+69, LT (SL-1)  
STA. 165+42, RT (SL-3)

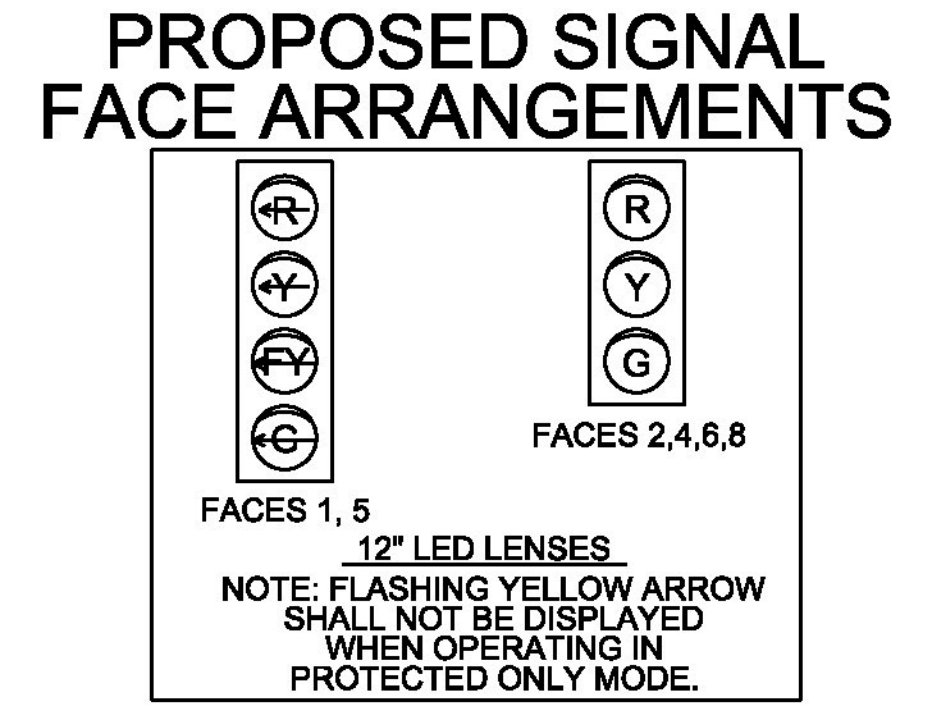
**SPECIAL PROVISION (LUMINAIRE, LED)**  
MAP-2 (SL-2)  
STA. 164+69, LT (SL-1)  
STA. 165+42, RT (SL-3)

### LIST OF MAJOR EQUIPMENT

EQUIPMENT UNDER PAY ITEM 678.15 - (US ROUTE 7 & LITTLE CHICAGO/MIDDLEBROOK ROADS)	QUANTITY	REMARKS
STEEL MAST ARM SIGNAL POLE	2	FLAT BLACK, MAP 1=20', MAP 2=29'
STEEL MAST ARMS	4	FLAT BLACK, MA 1A=30', MA 1B=20', MA 2A=40', MA 2B=20'
POWER METER ON STANCHION	1	WITH TWO BAY BREAKER PANEL
TRAFFIC SIGNAL CONTROLLER	1	ECONOLITE ASC/3-2100 NEMA TS-2
NEW 12-INCH LED SIGNAL HEADS (ONE-WAY, 3-SECTION, VISORS, DISCONNECT HANGERS, BACKPLATES AND MOUNTING HARDWARE)	8	FLAT BLACK
NEW 12-INCH LED SIGNAL HEADS (ONE-WAY, 4-SECTION, VISORS, DISCONNECT HANGERS, BACKPLATES AND MOUNTING HARDWARE)	2	FLAT BLACK
GPS TIME CLOCK	1	INSTANTANEOUS UPDATING
NEMA P44 BASE MOUNTED CONTROLLER CABINET WITH 15-INCH EXTENDED BASE ON A CONCRETE FOUNDATION, PAINTED FLAT BLACK WITH ANCILLARY EQUIPMENT	1	FLAT BLACK
DETECTOR ASSEMBLY	4-6	AS REQUIRED
VEHICLE DETECTION PROCESSOR (CARDS)	1-4	AS REQUIRED

### 2014 HOURLY VOLUMES US ROUTE 7 & LITTLE CHICAGO

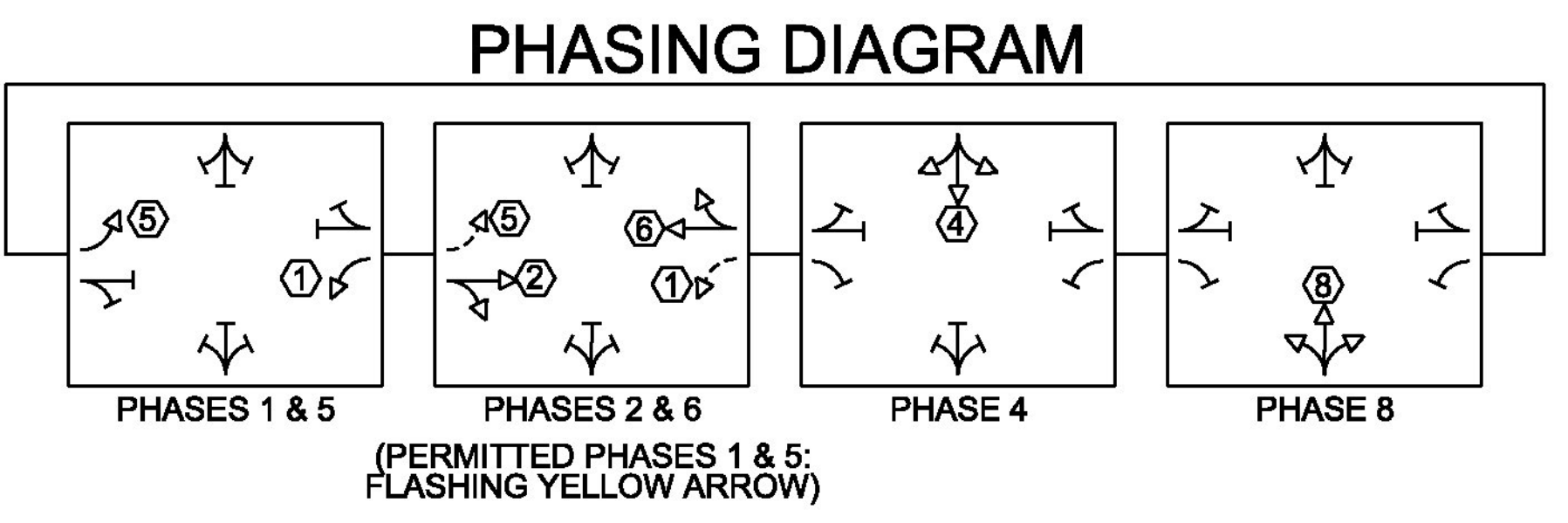
AM	OFF	PM
20	25	15
520	450	610
20	20	25



CONDUIT	WIRED CONDUIT SIZE		ELECTRICAL CONDUIT SIZE		DESCRIPTION
	2"	4"	2"	4"	
POLE TO STANCHION	25	48.4			POWER
POLE TO STANCHION - CABINET			25	38	COMMUNICATIONS
STANCHION TO CABINET	45	10.42			POWER
<del>STANCHION TO CABINET</del>			15		<del>COMMUNICATIONS</del>
CONTROLLER TO MAP1	49	9.15			SIGNAL/LIGHTING
CONTROLLER TO MAP1	49	9.15			DETECTION
CONTROLLER TO MAP1			43	9.2	FUTURE USE
CONTROLLER TO PB1	39	36.08			SIGNAL/LIGHTING
CONTROLLER TO PB1	39	36.08			DETECTION
CONTROLLER TO PB1			30	36.08	FUTURE USE
PB1 TO DPB1	70	83.16			SIGNAL/LIGHTING
PB1 TO DPB1	70	83.16			DETECTION
PB1 TO DPB1			70	83.17	FUTURE USE
DPB1 TO MAP2	40	17			SIGNAL/LIGHTING
DPB1 TO MAP2	40	17			DETECTION
DPB1 TO MAP2			48	17	FUTURE USE
DPB1 TO PB2	86	79.84			SIGNAL/LIGHTING
DPB1 TO PB2	86	79.84			FUTURE PED USE
DPB1 TO PB2			86	79.83	FUTURE USE
PB2 TO SL3	24	30			SIGNAL/LIGHTING
PB2 TO SL3			24	30	FUTURE USE
PB1 TO SL1	40	21.25			SIGNAL/LIGHTING
PB1 TO SL1			40	21.25	FUTURE USE
SUBTOTAL	564	560.53	326	314.53	
ROUNDING	9	-0.03	4	-0.03	
TOTALS	564	560.5	330	314.5	

### LEGEND

- ▬ MAST ARM & POLE
- CC CONTROLLER CABINET
- PB PULLBOX
- ② SIGNAL HEAD WITH PHASE NO.
- WIRED CONDUIT
- ==== WIRED CONDUIT IN ELECTRICAL CONDUIT SLEEVE
- ⊖ MAST ARM-MOUNTED SIGN
- ⊖ VEHICLE STOP BAR DETECTOR
- ⊖ VEHICLE STOP BAR DETECTION AREA
- ⊖ PREEMPTION STROBE LIGHT & DETECTOR
- ⊖ LUMINAIRE



- NOTES:**
- TRAFFIC ITEMS LISTED ARE APPROXIMATE LOCATIONS AND MAY BE MODIFIED BY THE ENGINEER IN THE FIELD.
  - CONDUIT NOTED AS FUTURE USE WILL BE PAID AS ELECTRICAL CONDUIT. ALL WIRED CONDUIT, REGARDLESS OF TYPE, WILL BE PAID AS WIRED CONDUIT.
  - STOP BAR AND ADVANCE DETECTOR MOUNTING LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH THE MANUFACTURER'S GUIDANCE FOR THE TYPE OF DETECTOR SUPPLIED. THE CONTRACTOR SHALL SUBMIT PROPOSED MOUNTING LOCATIONS AND DOCUMENTATION OF CONFORMANCE WITH THE MANUFACTURER'S GUIDANCE TO THE ENGINEER FOR APPROVAL.
  - SLEEVE S2 IS ANTICIPATED TO CROSS UNDER AN EXISTING DRAINAGE PIPE AT APPROXIMATE STA. 20+50 LT, 26.5'. THE EXISTING DRAINAGE INVERT IS APPROXIMATE 4' BELOW GRADE.
  - ALL WORK RELATED TO PROVIDING A FULLY FUNCTIONAL TRAFFIC SIGNAL SYSTEM, INCLUDING ALL DETECTION EQUIPMENT, WILL BE PAID FOR UNDER ITEM 678.15 TRAFFIC CONTROL SIGNAL SYSTEM, INTERSECTION UNLESS OTHERWISE SPECIFIED.

PROJECT NAME:	FERRISBURGH	FILE NAME:	+13b016+tsl.dgn	PLOT DATE:	3/8/2016
PROJECT NUMBER:	NHG SCNL(42)	PROJECT LEADER:	I. DEGUTIS	DRAWN BY:	K. RECORD
		DESIGNED BY:	I. DEGUTIS	CHECKED BY:	P. COBURN
		TRAFFIC SIGNAL PLAN		SHEET	15 OF 22

# TRAFFIC SIGNAL GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION'S (VTRANS) "STANDARD SPECIFICATIONS FOR CONSTRUCTION", DATED 2011, WITH CURRENT MODIFICATIONS.
2. OVERHEAD SIGN/SIGNAL SUPPORTS SHALL CONFORM TO AASHTO'S "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", DATED 2013 AND ITS LATEST REVISIONS.
3. THE DESIGN CALCULATIONS SHALL TAKE INTO ACCOUNT THE FOLLOWING CRITERIA:

#### STRUCTURE CRITERIA

- DESIGN LIFE: 50 YEARS
- WIND LOAD: 90 M.P.H., UNLESS SPECIAL SITE CONDITIONS DICTATE. ICE LOAD PER AASHTO'S PUBLICATION ENTITLED "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAYS SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", DATED 2013, AND ITS LATEST REVISIONS

#### FATIGUE CRITERIA

- FATIGUE CATEGORY: 1 FOR MAST ARM SIGN STRUCTURES, 2 FOR SIGNAL MAST ARMS
- VORTEX SHEDDING: INCLUDE
- NATURAL WIND GUSTS: INCLUDE
- TRUCK INDUCED WIND GUSTS: INCLUDE FOR ROADWAYS WHERE SPEED LIMIT IS 40 M.P.H. OR GREATER
- GALLOPING: DO NOT INCLUDE IN DESIGN CALCULATIONS

#### FOUNDATION CRITERIA

- CONCRETE: CONCRETE, CLASS B, IN ACCORDANCE WITH SECTION 541
- REINFORCING STEEL: IN ACCORDANCE WITH SECTION 713.01
- ALLOWABLE BEARING CAPACITY: TO BE DETERMINED
- INTERNAL SOIL FRICTION ANGLE,  $\phi$  : TO BE DETERMINED

#### 4. ANCHOR BOLTS

FOUR GALVANIZED ANCHOR BOLTS WITH TWO HEXAGON NUTS, ONE WASHER AND ONE LOCK WASHER PER BOLT SHALL BE FURNISHED WITH EACH POLE. AFTER INSTALLATION, A MINIMUM OF TWO THREADS ON THE BOLT SHOULD BE EXPOSED ABOVE THE NUT.

#### 5. FLANGE BOLTS

ALL FLANGE BOLTS AND HEX NUTS SHALL BE HIGH STRENGTH STEEL AND SHALL CONFORM TO ASTM A325. THE FLANGE BOLTS SHALL BE CAPABLE OF RESISTING 133% OF THE FULL DESIGN STRESS OF THE TUBE AT ITS YIELD STRENGTH STRESS.

#### 6. HORIZONTAL AND VERTICAL MEMBERS

STEEL TUBES SHALL BE FORMED AND WELDED WITH ONE CONTINUOUS LONGITUDINAL WELD ONLY. AFTER FORMING AND WELDING THEY SHALL BE COLD ROLLED TO ENSURE UNIFORMITY OF SIZE AND SMOOTHNESS OF WELD. THEY SHALL HAVE A MINIMUM YIELD STRENGTH OF 55 KSI. THERE SHALL BE NO TRANSVERSE WELDING EXCEPT AT THE FLANGE CONNECTIONS AND POLE BASE PLATES, WHERE THE TUBES SHALL TELESCOPE THE FLANGES AND PLATES AND BE CONTINUOUSLY WELDED BOTH SIDES INSIDE AND OUT TO WITHSTAND THE FULL TRANSFER OF THE BENDING STRENGTH TO THE BOLTS. OPTIONALLY, THE MEMBERS MAY BE A SERIES OF TWO OR THREE DIFFERENT DIAMETER PIPES WELDED TOGETHER. STEEL TUBES SHALL BE CONSTRUCTED IN CONFORMANCE WITH SUBSECTION 752.03.

#### 7. GALVANIZING

ALL STEEL COMPONENTS, EXCEPT CONCRETE REINFORCING AND STAINLESS STEEL HARDWARE, ARE TO BE HOT DIPPED GALVANIZED AFTER FABRICATION. THE ASSEMBLIES SHALL BE DESIGNED AND FABRICATED TO PERMIT GALVANIZING ON ALL INTERIOR AND EXTERIOR SURFACES AND SHALL BE FREE OF POCKETS AND OTHER STRUCTURAL OBSTRUCTIONS THAT WILL NOT PERMIT PROPER DEPOSITION OF ZINC COATING. GALVANIZING SHALL BE IN ACCORDANCE WITH SUBSECTION 752.02.

#### 8. WELDING

- A. ALL DESIGN DETAILS, WORKMANSHIP, PROCEDURES AND INSPECTION SHALL CONFORM WITH SUBSECTION 506.10.
- B. ALL WELDS SHALL BE AT LEAST AS STRONG AS THE MATERIAL(S) BEING WELDED.

#### 9. FOUNDATIONS

- A. FOOTINGS SHALL BE DESIGNED IN ACCORDANCE WITH VTRANS' MATERIALS & RESEARCH ENGINEERING INSTRUCTIONS - GEOTECHNICAL DESIGN PROCEDURES FOR MAST ARM AND OVERHEAD SIGN SUPPORT FOUNDATIONS (MREI 10-01), DATED MARCH 9, 2010, A COPY OF WHICH CAN BE FOUND ON THE AGENCY'S WEBSITE.
- B. FOUNDATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING NOTES:
  1. A MINIMUM EMBEDMENT DEPTH OF FIVE FEET SHALL BE USED FOR ALL SPREAD FOOTING FOUNDATIONS; MEASURED FROM THE GROUND SURFACE ELEVATION TO THE BOTTOM OF THE FOOTING ELEVATION.
  2. EXCEPT FOR THE UPPERMOST TWO FEET OF SOIL, DRILLED SHAFT FOUNDATIONS, IF USED, SHALL BE POURED AGAINST UNDISTURBED MATERIAL; THE TOP TWO FEET OF SOIL SHALL BE NEGLECTED FOR DESIGN PURPOSES. A DISPOSABLE CIRCULAR CONCRETE FORM, IF USED, SHALL NOT BE PLACED DEEPER THAN TWO FEET, IN ORDER NOT TO REDUCE THE FRICTION BETWEEN THE SOIL AND THE CONCRETE.
  3. AS AN ALTERNATIVE TO THE DRILLED HOLES, FOOTINGS MAY BE POURED IN EXCAVATED HOLES USING THE PROPER FORMS, WHICH MUST BE REMOVED. THE EXCAVATED HOLES SHALL BE AT LEAST TWO FEET CLEAR OF THE FOUNDATION SIDES AND ONE FOOT DEEPER THAN THE FOUNDATION. CARE SHALL BE TAKEN TO AVOID EXCAVATING AROUND THE TOP OF THE FOUNDATION; THE BACKFILL MATERIAL SHALL BE COMPACTED AS DESCRIBED IN SUBSECTION 204.08. DESIGN LIMITS AS FOR AUGURED FOOTINGS APPLIES.
  4. ANY BACKFILL PLACED ADJACENT TO THE FOOTING SHALL BE GRANULAR MATERIAL MEETING THE REQUIREMENTS FOR GRANULAR BACKFILL FOR STRUCTURES, SUBSECTION 704.08 AND SHALL BE COMPACTED AS DESCRIBED IN SUBSECTION 204.08.
  5. CONCRETE FOR THE FOUNDATION SHALL CONFORM TO THE REQUIREMENTS OF SECTION 541, STRUCTURAL CONCRETE. IF DRILLED SHAFT FOUNDATIONS ARE USED, THE CONCRETE SPECIFICATIONS MAY NEED TO BE ADJUSTED FOR CONSTRUCTIBILITY ISSUES. HOWEVER, IF REQUIRED, THE CONTRACTOR SHALL SUBMIT ANY CHANGES TO THE CONCRETE SPECIFICATION FOR REVIEW BY THE VTRANS PROJECT MANAGER.

6. STEEL PILES, IF USED, SHALL MEET THE REQUIREMENTS OF SECTION 505.

7. WHEN THE DESIGN DEPTH OF A FOUNDATION CANNOT BE OBTAINED DUE TO UNFORSEEN FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR THE MANUFACTURER TO OBTAIN A REVISED FOUNDATION DESIGN. SUCH A REVISION SHALL BE SUBMITTED TO VTRANS PROJECT MANAGER AND MAY REQUIRE UP TO A FOUR WEEK REVIEW PERIOD BY VTRANS.

- C. SIGNALS/SIGNS SHALL BE INSTALLED AND LEVELED AND POLES SHALL BE PLUMB PRIOR TO PLACING GROUT UNDER POLE BASE. GROUT MATERIAL SHALL BE NON-SHRINKING MORTAR CONFORMING TO SUBSECTION 707.03, MORTAR TYPE IV. THIS WORK WILL BE CONSIDERED INCIDENTAL TO ITEM 678.15 TRAFFIC CONTROL SIGNAL SYSTEM, INTERSECTION.

10. EACH OVERHEAD TRAFFIC SIGNAL/SIGN SUPPORT SHALL BE GROUNDED. THE GROUND SHALL CONSIST OF THE FOLLOWING:

- A. AN INTERNAL GROUND LUG OPPOSITE THE HAND HOLE.
- B. A #6 (MIN.) SOFT DRAWN COPPER GROUNDING ELECTRODE CONDUCTOR.
- C. A 5/8" X 8 FOOT (MIN.) COPPER CLAD GROUNDING ELECTRODE:

THE RESISTANCE TO GROUND SHALL BE 25 OHMS OR LESS. ADDITIONAL GROUNDING ELECTRODES MAY BE REQUIRED (MINIMUM SPACING SHALL BE 6'). WHEN A POWER SERVICE, METER AND DISCONNECT ARE ATTACHED TO A POLE, THERE SHALL BE A CONTINUOUS GROUND WIRE FROM THE METER AND DISCONNECT WHICH MAY RUN INTERNAL TO THE UPRIGHT, THROUGH THE 1/2" FLEXIBLE TUBING IN THE CONCRETE BASE TO THE REQUIRED GROUNDING ELECTRODE(S). THE GROUND WIRE FROM THE POLE GROUNDING LUG, CONTROLLER CABINET AND/OR LUMINAIRE MAY ATTACH TO THE CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT. THE CONTRACTOR SHALL PERFORM A RESISTANCE TO GROUND TEST ON THE CONTINUOUS GROUND ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT AND PROVIDE A WRITTEN STATEMENT TO THE AREA ELECTRICAL INSPECTOR THAT THE GROUNDING ELECTRODE CONDUCTOR IS CONTINUOUS FROM THE SERVICE METER AND DISCONNECT AND THE RESISTANCE TO GROUND IS 25 OHMS OR LESS.

11. HORIZONTAL MEMBERS SHALL BE CAMBERED AND THE VERTICAL POLES BACK RAKED, WHERE APPLICABLE, TO THE ANTICIPATED DEAD LOAD DEFLECTION PLUS THE CAMBER, IF ANY, SPECIFIED ON THE PLANS.

12. AN EQUIVALENT ALTERNATE DESIGN MAY BE SUBSTITUTED FOR THE DETAILS AND MATERIALS SHOWN.

13. THE DETAILS OF DESIGN FOR THE STRUCTURE AND FOUNDATION ARE TO BE SUPPLIED BY THE CONTRACTOR AND/OR BY THE MANUFACTURER, THE STRUCTURE SHALL BE DESIGNED TO RESIST THE MAXIMUM LOADING AS OUTLINED IN THE AASHTO STANDARD SPECIFICATIONS, SEE NOTE 2. ALL DESIGN CALCULATIONS FOR THE STRUCTURE AND THE FOUNDATION SHALL BE CHECKED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF VERMONT PRIOR TO SUBMITTAL OF THE FABRICATION DRAWINGS TO VTRANS.

14. THE CONTRACTOR SHALL SUBMIT THREE COPIES (OR ONE DIGITAL VERSION) OF THE DESIGN CALCULATIONS TO VTRANS PROJECT MANAGER SHOWING THE FOLLOWING INFORMATION FOR EACH OF THE VERTICAL AND HORIZONTAL COMPONENTS OF THE STRUCTURE AND FOUNDATION:

- A. THE DESIGN AXIAL AND SHEAR FORCES AND BENDING AND TORSIONAL MOMENTS ACTING AT THE TOP OF THE FOUNDATION;
- B. THE DESIGN AXIAL, BENDING AND SHEAR STRESSES AND THE COMBINED STRESS RATIO;
- C. VIBRATION AND FATIGUE CALCULATIONS AS SET FORTH IN SECTION 11 OF THE AASHTO PUBLICATION REFERENCED IN NOTE 2;
- D. THE ALLOWABLE AXIAL, BENDING, AND SHEAR STRESSES;
- E. ITEMS A, B, AND D SHALL BE SHOWN FOR EACH OF THE GROUP LOADINGS (I, II, III) AND FOR THE BASIC WIND LOAD APPLIED TO THE TWO CASES OUTLINED IN THE AASHTO STANDARD SPECIFICATIONS (SEE NOTE 2), SECTION 1.2.5(D)(4);
- F. FAILURE TO SUPPLY THE PROPER DESIGN INFORMATION SHALL BE CAUSE FOR REJECTION OF THE STRUCTURE;
- G. A MINIMUM OF FOUR WEEKS SHALL BE REQUIRED FOR REVIEW BY VTRANS;
- H. EVERY MEMBER AND CONNECTION IN AN OVERHEAD TRAFFIC SIGNAL SUPPORT SHALL BE DESIGNED TO PROVIDE ADDITIONAL RESIDUAL CAPACITY FOR FUTURE MODIFICATION EQUIVALENT TO A 5-SECTION TRAFFIC SIGNAL HEAD WITH A 5-INCH LOUVERED BACKPLATE LOCATED ON THE OUTERMOST EXTENT OF THE MAST ARM.

15. FABRICATION DRAWINGS SHALL BE SUBMITTED TO VTRANS PROJECT MANAGER FOR APPROVAL PRIOR TO FABRICATION. THE FABRICATION DRAWINGS SHALL INCLUDE THE FOLLOWING INFORMATION:

- A. DETAILED DRAWING OF EACH COMPONENT OF THE STRUCTURE;
- B. MATERIAL SPECIFICATION FOR EACH COMPONENT OF THE STRUCTURE, EITHER BY COMPLETE SPECIFICATION OR REFERENCE TO APPLICABLE AASHTO AND ASTM STANDARDS;
- C. NOTATION OF PROJECT NAME, PROJECT NUMBER, ROUTE NUMBER, AND STRUCTURE STATIONING TO BE INCLUDED ON EACH SHEET;
- D. DETAILS FOR LOCATION OF SIGNS/SIGNALS AND ATTACHMENT HARDWARE FOR THE SUPPORT STRUCTURE;
- E. ALL ELEVATIONS AND DIMENSIONS NECESSARY TO PROVIDE A COMPLETE SET OF RECORD PLANS;
- F. DEAD LOAD DEFLECTION AND CAMBER INFORMATION;
- G. WELDING DETAILS AND PROCEDURES ARE REQUIRED FOR ALL WELDS. PROCEDURES SHALL BE SUBMITTED FOR APPROVAL WITH REFERENCE TO EACH WELD IDENTIFIED ON THE FABRICATION DRAWINGS AND SHALL BE IN ACCORDANCE WITH SUBSECTION 506.10.

16. THE TRAFFIC SIGNALS SHALL BE MOUNTED TO THE ARM OR POLE USING A FIXED MOUNT SYSTEM, UNLESS OTHERWISE NOTED ON THE CROSS SECTION SHEET. FOR SIGNALS MOUNTED ON A MAST ARM, THE MAST ARM AND MOUNTING POINT SHALL BE IN THE MIDDLE OF THE SIGNAL HEAD.


17. BASE PLATES SHALL BE STAMPED WITH THE VERTICAL POLE DIAMETER, HEIGHT, YIELD STRENGTH, GAUGE AND THE HORIZONTAL MEMBER DIAMETER, LENGTH, YIELD STRENGTH, AND GAUGE, ALTERNATELY. THE INFORMATION MAY BE STAMPED ON A METAL TAG RIVETED TO THE POLE NEAR THE HAND HOLE.

18. SEE STANDARD E-171A FOR ADDITIONAL NOTES.

PROJECT NAME:	FERRISBURGH
PROJECT NUMBER:	NHG SCNL(42)
FILE NAME: +13b016frm.dgn	PLOT DATE: 3/8/2016
PROJECT LEADER: I. DEGUTIS	DRAWN BY: I. DEGUTIS
DESIGNED BY: I. DEGUTIS	CHECKED BY: P. COBURN
TRAFFIC SIGNAL GENERAL NOTES	SHEET 16 OF 22

# TRAFFIC SIGNAL SYSTEM NOTES

## A. NEW SIGNAL EQUIPMENT

- ALL SIGNAL HEADS SHALL BE 12" POLYCARBONATE. THE SIGNAL HEADS SHALL HAVE FLAT BLACK HOUSINGS AND VISORS.
- ALL SIGNAL HEADS SHALL HAVE FLAT BLACK LOUVERED BACKPLATES WITH ANY MUTCD COMPLIANT RETROREFLECTIVE BORDER. 
- THE CONTROLLER SHALL BE AN ECONOLITE ASC/3-2100 (NEMA TS2) IN A NEMA P44 TRAFFIC CONTROL CABINET WITH A 15-INCH BASE EXTENSION INSTALLED AT THE LOCATION SHOWN ON THE PLANS. THE CONCRETE BASE FOR THE CONTROLLER CABINET SHALL HAVE A 18" X 12" OPENING FOR CONDUIT LOCATED IN THE CENTER. THE OPENING SHALL BE FILLED WITH STONE AND UNUSED CONDUIT PLUGGED WITH STEEL WOOL BEFORE PLUG SEAL IS INSTALLED. THE TRAFFIC CONTROL CABINET SHALL BE ORIENTED SUCH THAT THE DOOR DOES NOT FACE THE ROADWAY.
- ALL SIGNAL HEADS SHALL HAVE RED, YELLOW AND GREEN L.E.D. SIGNALS WITH A VISIBLE BEAM SPREAD OF 80 DEGREES OFF AXIS.
- ALL TRAFFIC SIGNAL EQUIPMENT SHALL BE PAINTED FLAT BLACK.
- ALL TRAFFIC SIGNAL EQUIPMENT AND MAST ARM MOUNTED SIGNS SHALL HAVE SAFETY CABLES.
- A DISCONNECT BREAKER FOR EACH CIRCUIT SHALL BE INSTALLED IN A RAINPROOF (NEMA 3R), LOCKED CABINET ON A STANCHION NEXT TO OR BELOW THE METER SOCKET.

## B. SIGNAL OPERATION

- TURN ON OF THE NEW TRAFFIC SIGNAL SYSTEM SHALL NOT OCCUR DURING PEAK TRAFFIC PERIODS. UNIFORMED TRAFFIC OFFICERS SHALL CONTROL TRAFFIC DURING THE TURN ON.
- ALL SIGNALS SHALL DWELL ON US ROUTE 7 UNLESS OTHERWISE NOTED.
- THE US ROUTE 7 THRU PHASE GREEN SHALL BE USED FOR THE START-UP PHASE FOLLOWING FLASHING OPERATION.
- SIGNAL TIMING SHOWN ON THE PLANS MAY REQUIRE FINE-TUNING IN THE FIELD BASED ON TRAFFIC OBSERVATION AND/OR ADDITIONAL FIELD STUDIES.

## C. PULLBOXES

- PULLBOXES ARE DETAILED ON VTRANS STANDARD E-173.
- THE LOGO ON PULLBOX COVER SHALL BE "TRAFFIC SIGNAL", "LIGHTING", OR "TRAFFIC SIGNAL AND LIGHTING" AS APPROPRIATE
- ALL PULLBOXES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 678.

## D. TRAFFIC SIGNAL/STREET LIGHTING CONDUIT

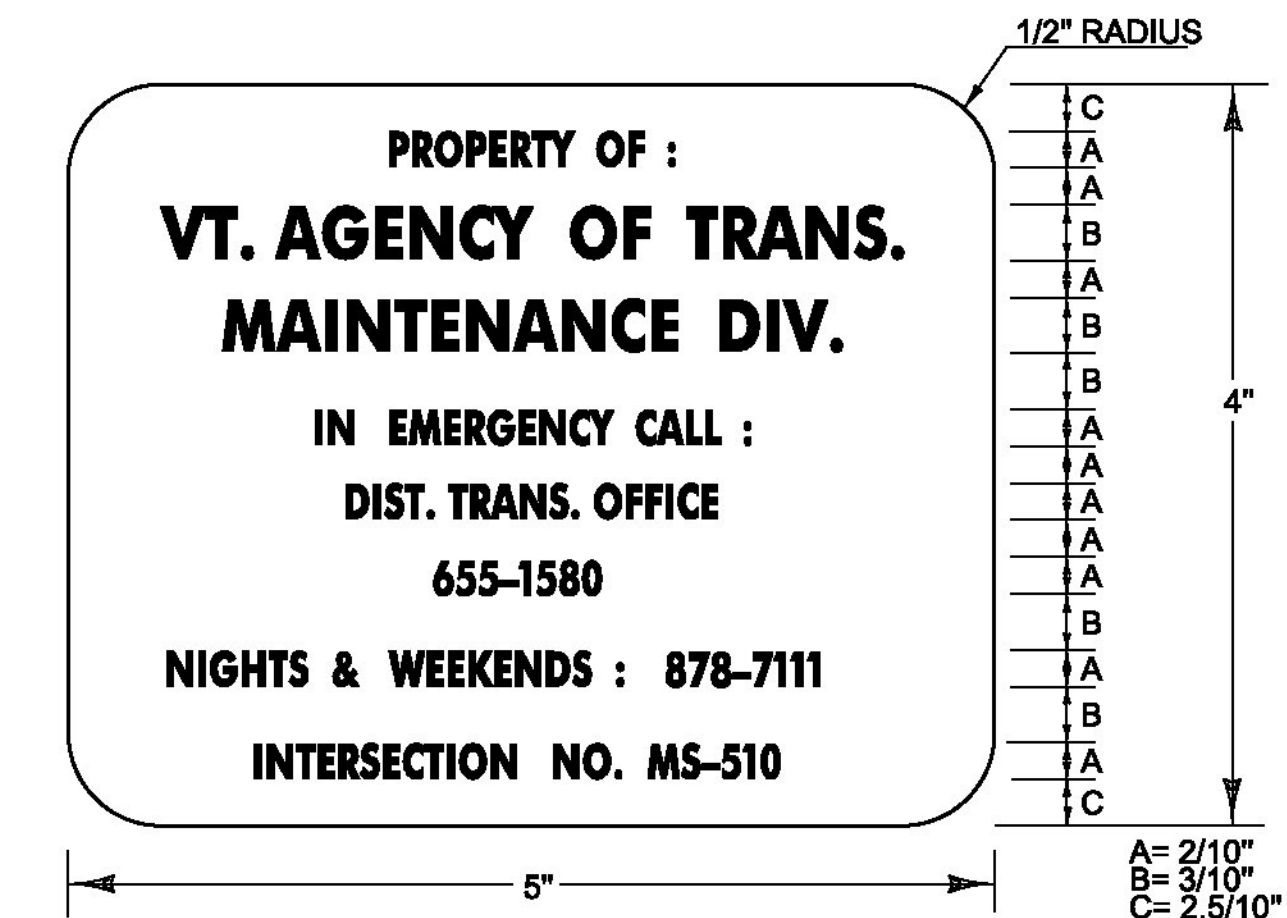
- ALL TRAFFIC SIGNAL/STREET LIGHTING CONDUIT SHALL BE SCHEDULE 80 PVC.
- WHEN CONDUIT IS PLACED BELOW THE ROADWAY OR ACROSS SIDE ROADS, IT SHALL BE PLACED IN A STEEL OR HDPE SLEEVE, SIZE AS SHOWN ON THE PLANS. SLEEVES UNDER ROADWAYS SHALL BE INSTALLED BY MEANS OF DIRECTIONAL DRILLING. OPEN CUT WILL NOT BE ALLOWED.
- ALL UNUSED CONDUIT ENDS SHALL BE FILLED WITH STEEL WOOL PRIOR TO BEING CAPPED.
- ALL TRAFFIC SIGNAL/STREET LIGHTING CONDUIT WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 678.

## E. DETECTION EQUIPMENT

- STOP BAR AND ADVANCED VEHICLE DETECTOR LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH THE MANUFACTURER'S GUIDANCE FOR THE TYPE OF DETECTOR SUPPLIED. THE CONTRACTOR SHALL SUBMIT PROPOSED MOUNTING LOCATIONS AND DOCUMENTATION OF CONFORMANCE WITH THE MANUFACTURER'S GUIDANCE TO THE ENGINEER FOR APPROVAL.
- VEHICLE DETECTORS SHALL BE PLACED SO THAT OCCLUSION IS MINIMIZED AND PHASING IS NOT AFFECTED.
- VEHICLE STOP BAR DETECTION AREAS SHALL EXTEND FIVE FEET PAST THE STOP BAR.
- ADVANCED VEHICLE DETECTION AREA SHALL BE A MINIMUM OF 350 TO 400 FEET UPSTREAM OF THE FINAL, PERMANENT STOP BAR.
- DILEMMA ZONE DETECTION BY THE ADVANCED VEHICLE DETECTION SYSTEM IS REQUIRED ON PHASES 2 & 6. IT SHALL PROVIDE DETECTION OF RANGE, SPEED AND ESTIMATED TIME OF ARRIVAL OF APPROACHING VEHICLES IN A CONTINUOUS RANGE OF 200 TO 600 FEET FROM THE FINAL LOCATION OF THE DETECTOR UNIT. DILEMMA ZONE ACTUATION SHALL EXTEND THE GREEN TIME BY 1-2 SECONDS.
- VEHICLE DETECTION SYSTEM SHALL BE ECONOLITE ACCUSCAN, WAVETRONIX SMARTSENSOR OR SMARTMICRO TRAFFIC RADAR.
- THERE SHALL BE NO WIRING SPLICES BETWEEN THE SIGNAL CONTROLLER EQUIPMENT AND THE VEHICLE DETECTORS.

## F. GENERAL

- A UNIFORMED TRAFFIC OFFICER WITH A BLUE LIGHT SHALL BE PRESENT DURING ALL LANE CLOSURES.
- THE CONTRACTOR SHALL ACQUIRE ALL THE NECESSARY PERMITS AND MAKE ALL NECESSARY ARRANGEMENTS WITH THE UTILITY COMPANY TO PROVIDE A PERMANENT POWER SUPPLY TO THE TRAFFIC SIGNAL EQUIPMENT, IF APPLICABLE. THE ROUTING OF POWER TO THE INTERSECTION SHALL BE SUCH THAT THE STATE HAS FULL RESPONSIBILITY FROM THE TRANSFORMER THROUGH THE SIGNAL SYSTEM. NO INTERVENING OWNERSHIP/RESPONSIBILITY SHALL BE ALLOWED.
- ALL ELECTRICAL WIRING SHALL BE PERFORMED BY A LICENSED ELECTRICIAN AND OVERSEEN BY A MASTER ELECTRICIAN.



LEGEND: - BLACK (NON-REFL.) - STAMPED PRIOR TO PAINTING  
BACKGROUND: NATURAL ALUMINUM OR BRASS SURFACE

## NOTES:

- THE PLAQUE SHALL BE MOUNTED ON THE TRAFFIC SIGNAL CONTROLLER CABINET. IT SHALL BE FASTENED TO THE CONTROLLER CABINET IN SUCH A MANNER AS TO BE NOT EASILY REMOVED, SUCH AS WELDED, RIVETED OR BOLTED WITH VANDAL PROOF BOLTS.
- THE LETTERS SHALL BE PUNCHED OR STAMPED, SUCH STAMPING SHALL PENETRATE AT LEAST 1/2 THE BASE MATERIAL THICKNESS.
- THE BASE MATERIAL FOR THE PLAQUE SHALL BE BRASS OR ALUMINUM WITH A MINIMUM THICKNESS OF 1/16".

## CONTROLLER IDENTIFICATION PLAQUE

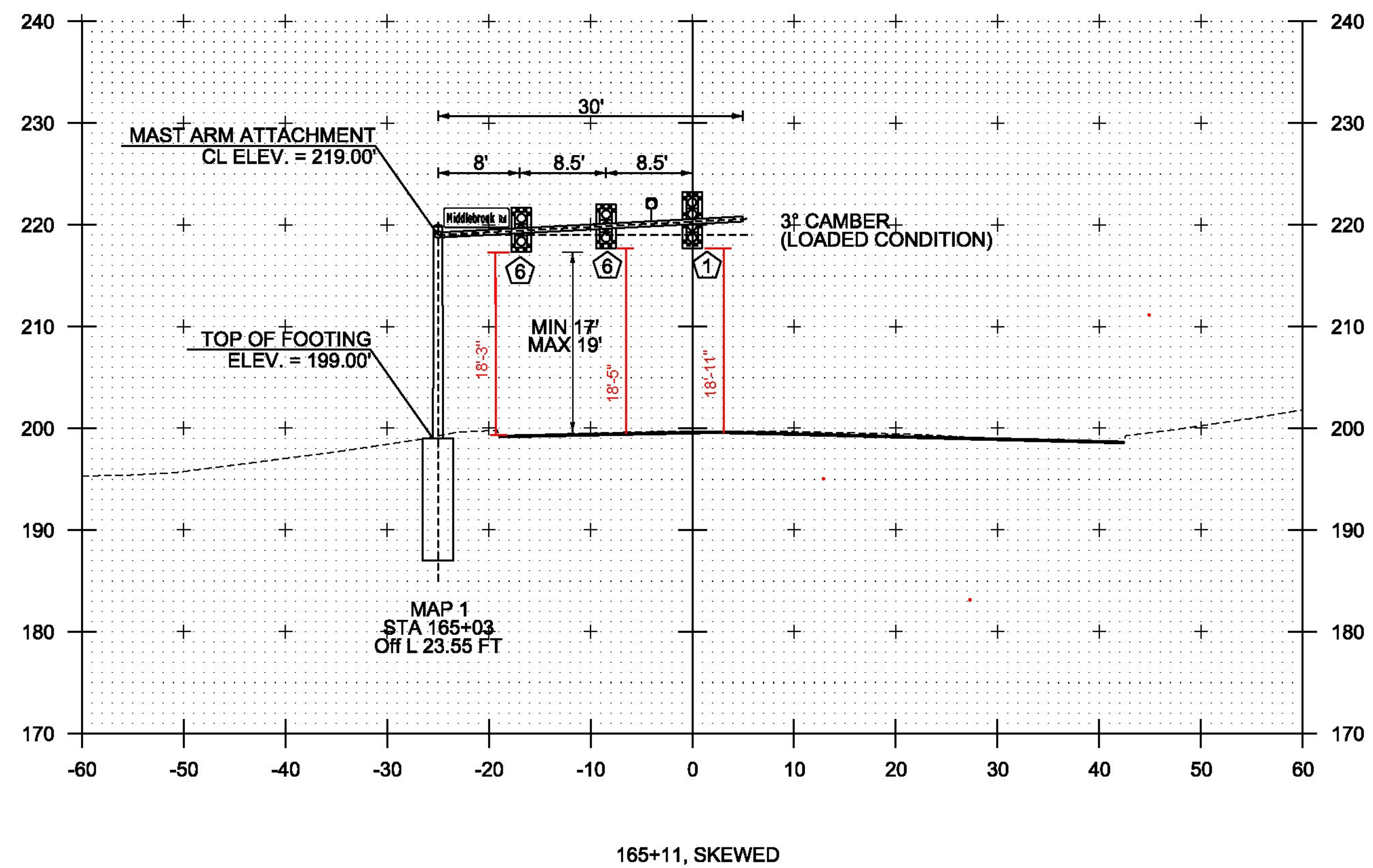
NOT TO SCALE

 4/19/2016 - REVISED WORDING TO ALLOW ANY MUTCD-COMPLIANT RETROREFLECTIVE BORDER.

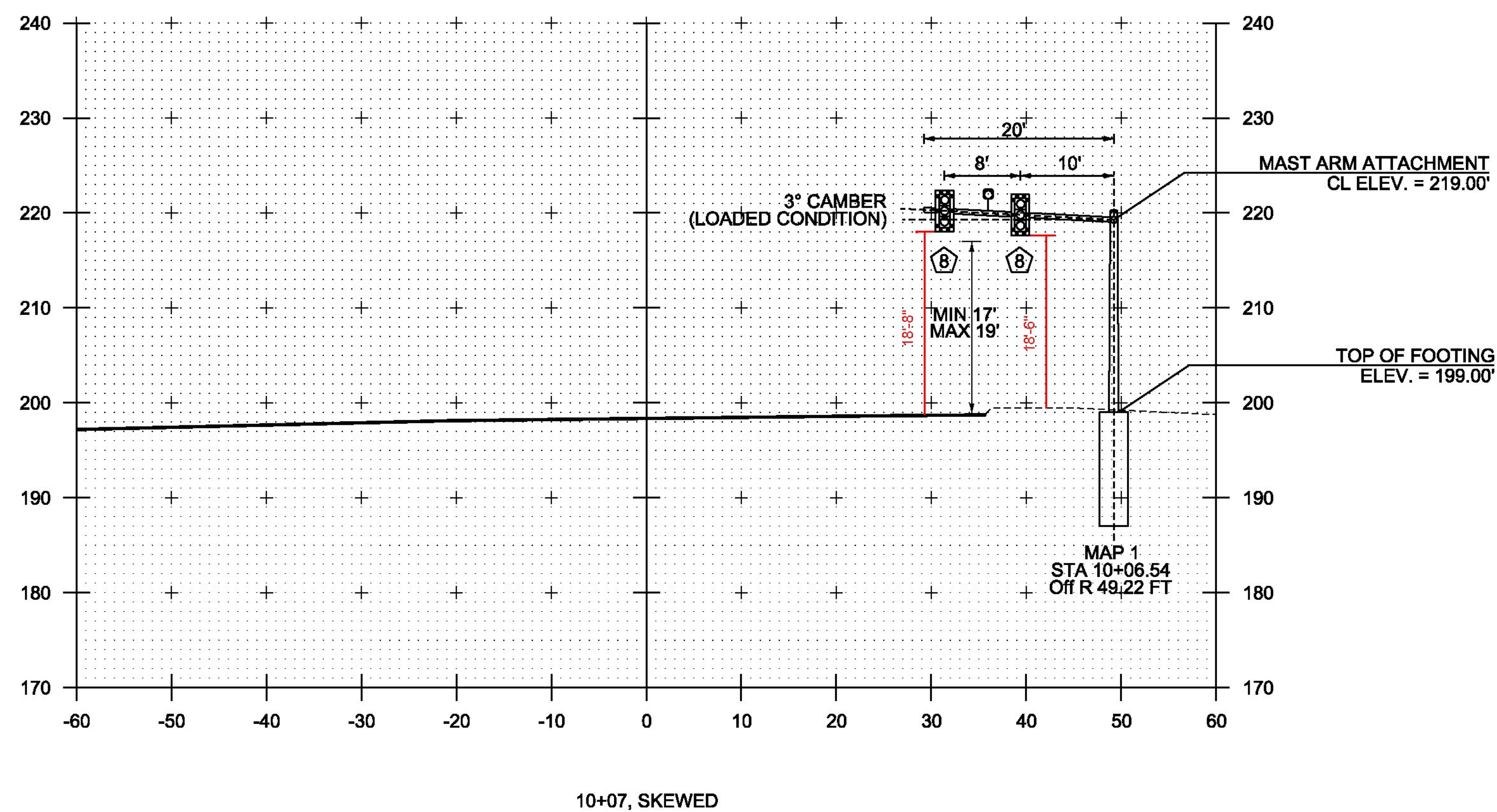
PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

FILE NAME: t13b016frm.dgn PLOT DATE: 4/19/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: I. DEGUTIS  
DESIGNED BY: I. DEGUTIS CHECKED BY: P. COBURN  
TRAFFIC SIGNAL SYSTEM NOTES SHEET 17 OF 22

MAST ARM 1A  
US 7 LOOKING NORTH  
(SECTION SKEWED  
ALONG MAST ARM)



MAST ARM 1B  
TH #14 LOOKING WEST  
(SECTION SKEWED  
ALONG MAST ARM)



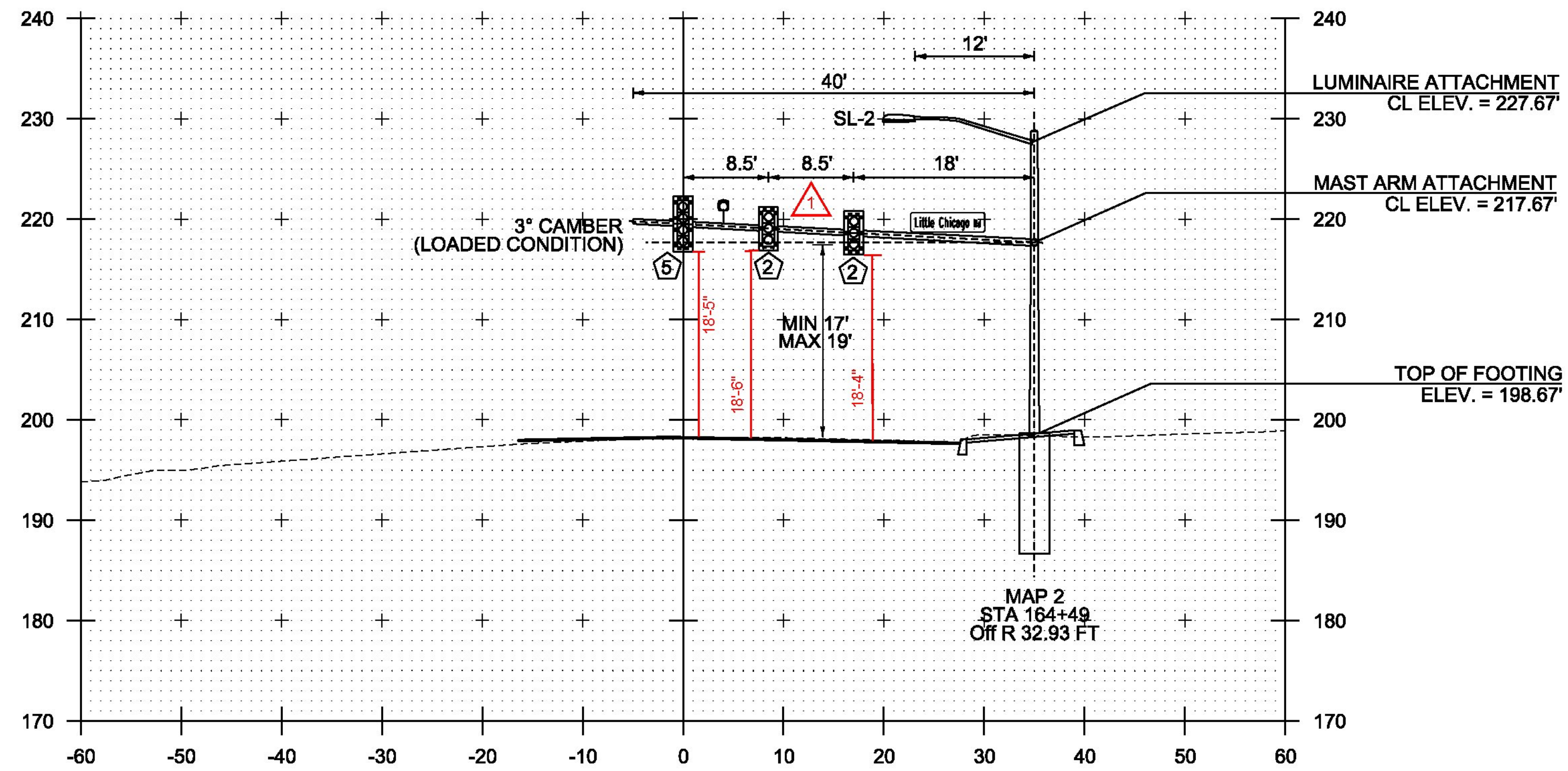
NOTES :

1. ALL MAST ARM FOUNDATIONS SHALL INCLUDE A 4" REVEAL. ELEVATIONS SHOWN IN CROSS-SECTIONS ARE APPROXIMATE FINAL GRADE ELEVATIONS FOR CONTRACTOR BIDDING PURPOSES ONLY. ACTUAL FOUNDATION ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR PRIOR TO SUBMITTING WORKING DRAWINGS.
2. MAST ARM FOUNDATION SIZES ARE NOT TO SCALE. FOUNDATION DESIGNS SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH SOIL CONDITIONS AND ACTUAL MAST ARM LOADINGS TRANSMITTED TO THE TOP OF THE FOUNDATION.
3. REFER TO BORING LOG SHEET 1-2 FOR BORING INFORMATION. FOR ADDITIONAL INFORMATION, REFER TO THE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS.
4. SIGNAL HEADS SHALL BE MOUNTED ON THE VERTICAL CENTER OF THE MAST ARM.

PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

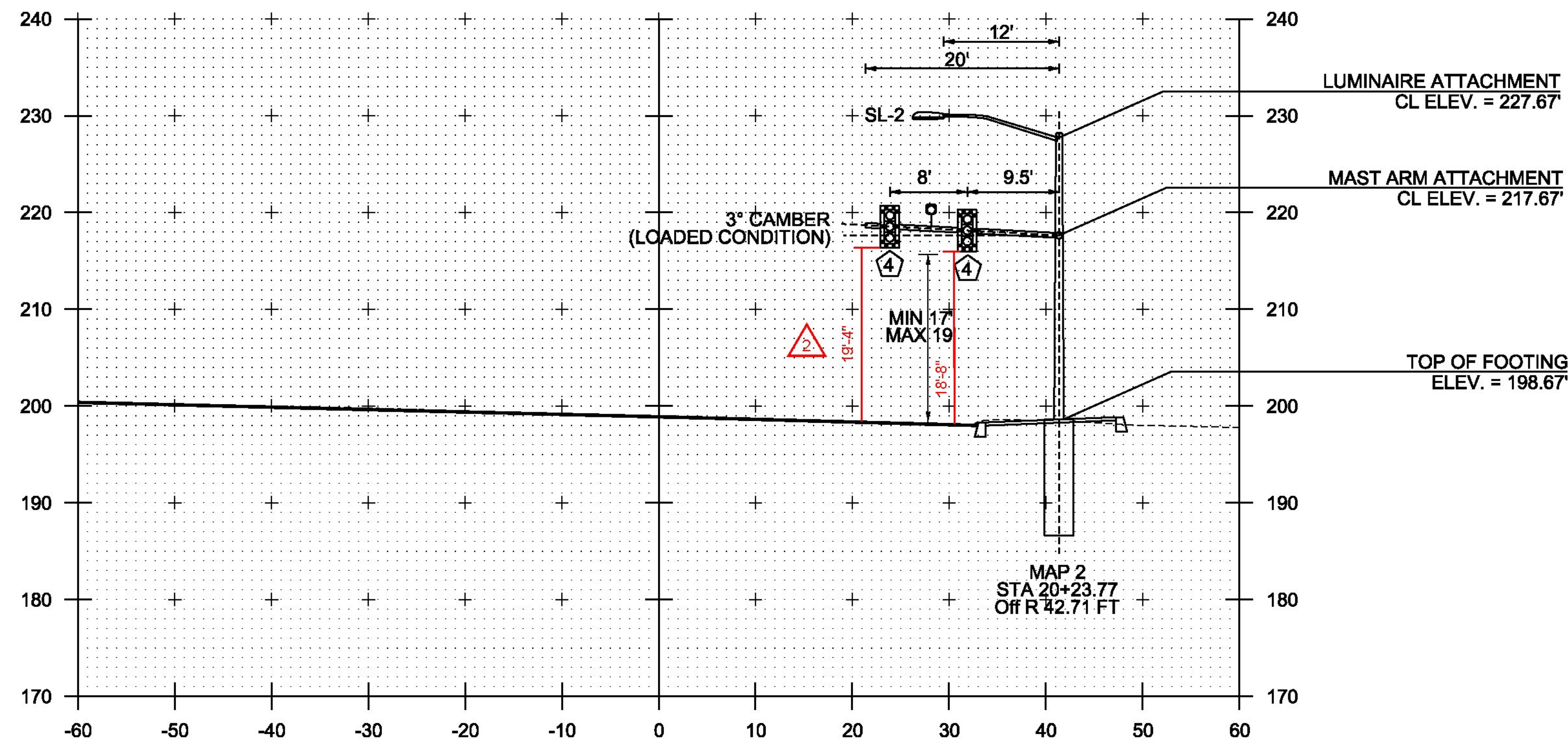
FILE NAME: +13b016frm.dgn PLOT DATE: 3/2/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: K. RECORD  
DESIGNED BY: K. RECORD CHECKED BY: I. DEGUTIS  
MAST ARM CROSS SECTION SHEET 1 SHEET 18 OF 22

MAST ARM 2A  
US 7 LOOKING NORTH  
(SECTION SKEWED  
ALONG MAST ARM)



164+37, SKEWED

MAST ARM 2B  
TH #5 LOOKING EAST  
(SECTION SKEWED  
ALONG MAST ARM)



20+19, SKEWED

1 SIGNAL HEADS 1 & 2 ON MA 2A MOVED 3' TO THE EAST.  
PER PM (IAN DEGUTIS) & RE

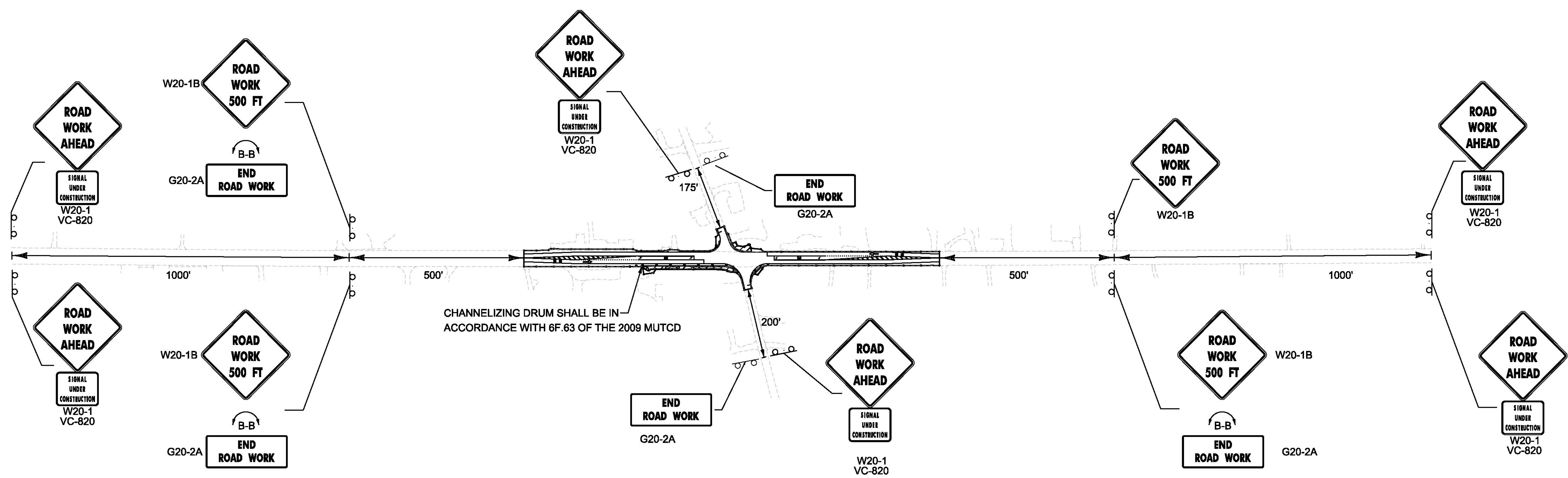
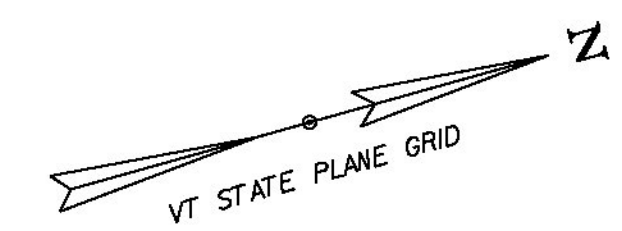
2 VERBALLY OK'D BY IAN DEGUTIS PRIOR TO INSPECTION ON 10/25/2016

NOTES :

1. ALL MAST ARM FOUNDATIONS SHALL INCLUDE A 4" REVEAL. ELEVATIONS SHOWN IN CROSS-SECTIONS ARE APPROXIMATE FINAL GRADE ELEVATIONS FOR CONTRACTOR BIDDING PURPOSES ONLY. ACTUAL FOUNDATION ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR PRIOR TO SUBMITTING WORKING DRAWINGS.
2. MAST ARM FOUNDATION SIZES ARE NOT TO SCALE. FOUNDATION DESIGNS SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH SOIL CONDITIONS AND ACTUAL MAST ARM LOADINGS TRANSMITTED TO THE TOP OF THE FOUNDATION.
3. REFER TO BORING LOG SHEET 1-2 FOR BORING INFORMATION. FOR ADDITIONAL INFORMATION, REFER TO THE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS.
4. SIGNAL HEADS SHALL BE MOUNTED ON THE VERTICAL CENTER OF THE MAST ARM.

PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

FILE NAME: +13b016frm.dgn PLOT DATE: 3/2/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: K. RECORD  
DESIGNED BY: K. RECORD CHECKED BY: I. DEGUTIS  
MAST ARM CROSS SECTION SHEET 2 SHEET 19 OF 22



**TRAFFIC CONTROL NOTES**

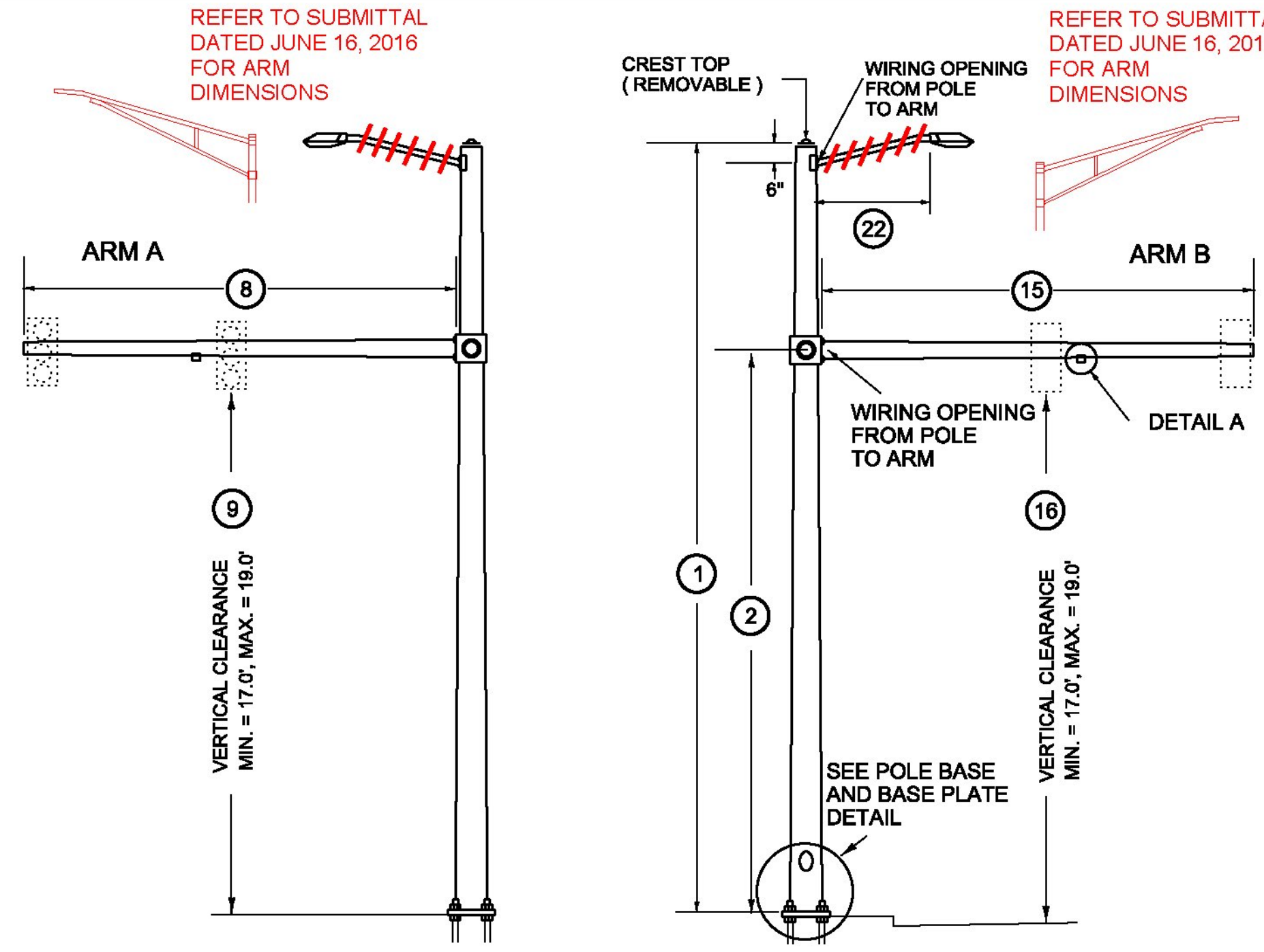
1. NO CONSTRUCTION SIGNS SHALL BE INSTALLED AS TO INTERFERE OR OBSTRUCT THE VIEW OF EXISTING SIGNS, TRAFFIC CONTROL DEVICES, OR STOPPING SIGHT DISTANCES. ADDITIONAL TRAFFIC CONTROL DEVICES MAY BE REQUIRED AND SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER.
2. TRAFFIC CONTROL SIGNING AND CHANNELIZING DEVICES SHALL BE IN ACCORDANCE WITH THE APPROPRIATE STANDARD DRAWINGS (T-1, T-10, T-17, T-28, T-30, T-35) AND THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). CONSTRUCTION APPROACH SIGNING SHALL REMAIN IN PLACE DURING THE ENTIRE CONSTRUCTION PERIOD. OTHER SIGNING AND DEVICES SHALL BE REMOVED OR COVERED WHEN NOT APPLICABLE.
3. DURING CONSTRUCTION, A MINIMUM OF ONE-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES ON ALL ROADS. TWO-WAY TRAFFIC SHALL BE MAINTAINED AT NIGHT, ON WEEKENDS AND HOLIDAYS, DURING PEAK TRAFFIC AND DURING CONSTRUCTION. AT THE DISCRETION OF THE ENGINEER, UNIFORMED TRAFFIC OFFICERS OR TRAINED FLAGGERS SHALL STOP TRAFFIC, WHENEVER REQUIRED.
4. MOST PROJECT WORK IS ANTICIPATED TO BE CONSTRUCTED WITH A SHOULDER CLOSURE IN ACCORDANCE WITH TYPICAL APPLICATION (TA) 3 OF THE 2009 MUTCD. WORK REQUIRING A LANE CLOSURE AND FLAGGERS SHALL BE IN ACCORDANCE WITH TA-14 OF THE 2009 MUTCD.
5. WORK REQUIRING A LANE CLOSURE IS ANTICIPATED TO BE SHORT DURATION AND RESTRICTED TO OFF-PEAK DAYTIME HOURS. ANY LANE OR ROAD CLOSURES SHOULD BE IN ACCORDANCE WITH TA 13 IN THE MUTCD.
6. COORDINATION WITH THE MIDDLEBURY-FERRISBURGH NH SURF(55) PAVING PROJECT MAY REQUIRE MODIFICATIONS TO THIS PLAN, INCLUDING BUT NOT LIMITED TO REMOVAL OR COVERING OF SIGNS, ADDITIONAL SIGNAGE, OR RELOCATING CONSTRUCTION SIGNS. PAYMENT FOR THIS COORDINATION WILL BE CONSIDERED INCIDENTAL TO ITEM 641.10.
7. AFTER SIGNAL INSTALLATION, ALL HEADS SHALL BE COVERED (TURNING SHALL NOT BE ALLOWED) UNTIL TURNED ON IN ACCORDANCE WITH SECTION 678.10.
8. A UNIFORMED TRAFFIC OFFICER WITH BLUE LIGHT SHALL BE PRESENT FOR THE SIGNAL TURN-ON.
9. PRIOR TO THE COMMENCEMENT OF ANY WORK OR THE PLACEMENT OF EQUIPMENT ON THE ROADWAY THE CONTRACTOR SHALL PROVIDE ADVANCED WARNING SIGNS IN ACCORDANCE WITH THIS TRAFFIC CONTROL PLAN AND THE LATEST EDITION OF THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
10. TWO PORTABLE CHANGEABLE MESSAGE SIGNS HAVE BEEN INCLUDED IN THIS CONTRACT FOR PLACEMENT ON US-7 NORTHBOUND AND US-7 SOUTHBOUND APPROACHES FOR ADVANCED WARNING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS AND COORDINATING ANY SIGNS AND MESSAGES WITH MIDDLEBURY-FERRISBURGH NH SURF(55). THE MESSAGE TO BE DISPLAYED SHALL BE APPROVED BY THE ENGINEER.
11. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ACCESS TO DRIVES WITHIN THE PROJECT LIMITS AT ALL TIMES AND COORDINATING WITH PROPERTY OWNERS.
12. FLAGGERS AND/OR TRAFFIC CONTROL PERSONNEL SHALL DIRECT BICYCLISTS THROUGH THE CONSTRUCTION AREA IN THE SAME MANNER AS VEHICULAR TRAFFIC. PEDESTRIANS, WHEN PRESENT, SHALL BE ESCORTED THROUGH THE WORK AREA. THE CONTRACTOR SHALL DESIGNATE AN EMPLOYEE TO ESCORT PEDESTRIANS AROUND THE PERIMETER OF THE CONSTRUCTION SITE.

**TRAFFIC CONTROL LEGEND**

- WORK AREA
- SIGN
- CHANNELIZING DRUM

PROJECT NAME:	FERRISBURGH
PROJECT NUMBER:	NHG SCNL(42)
FILE NAME: +13b016+tcp.dgn	PLOT DATE: 3/2/2016
PROJECT LEADER: I. DEGUTIS	DRAWN BY: K. RECORD
DESIGNED BY: K. RECORD	CHECKED BY: I. DEGUTIS
TRAFFIC CONTROL PLAN	SHEET 20 OF 22

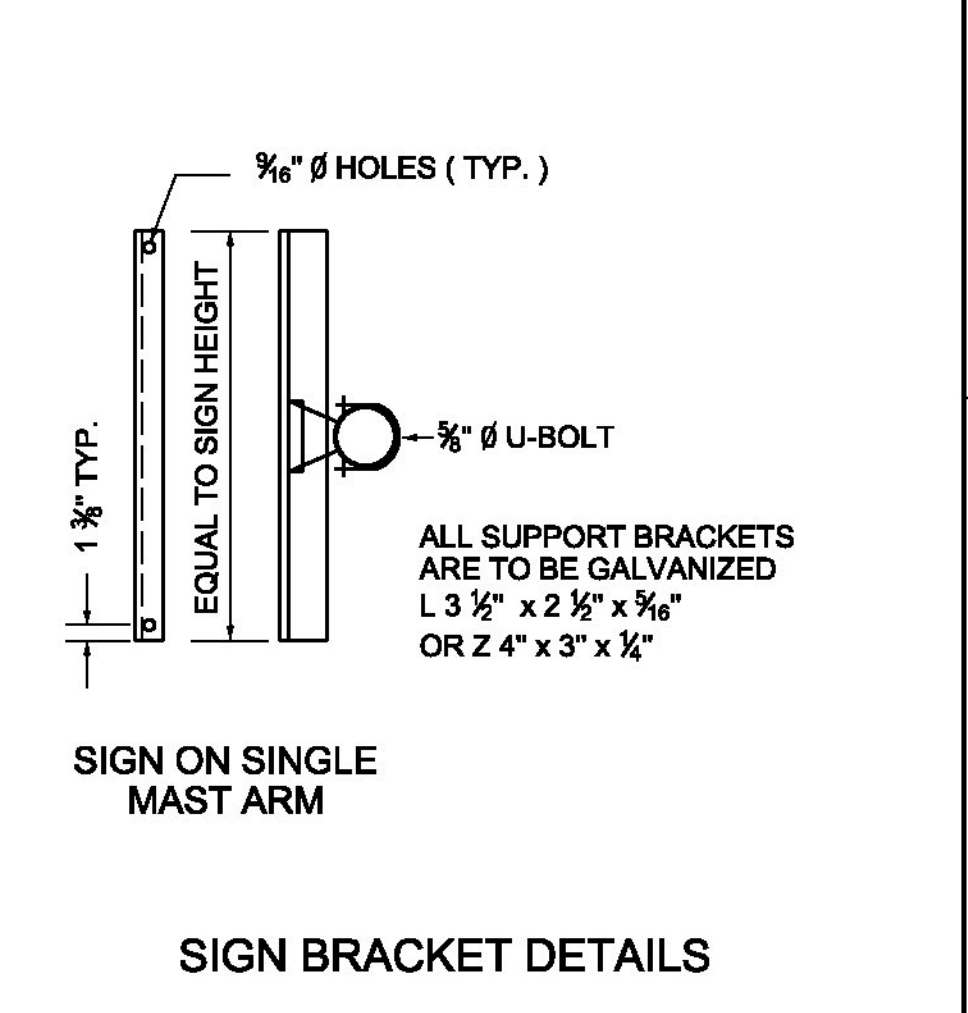
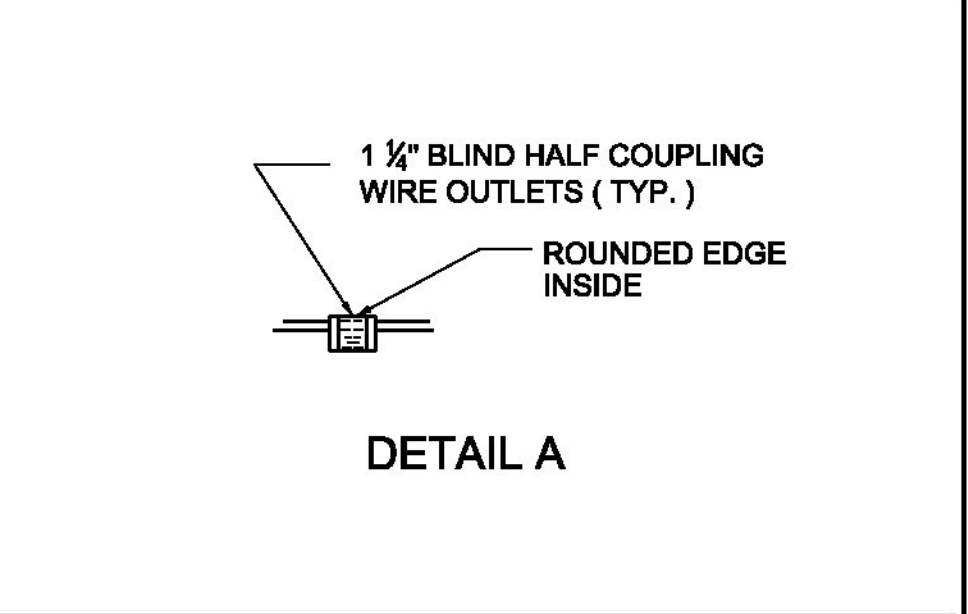
NOT TO SCALE



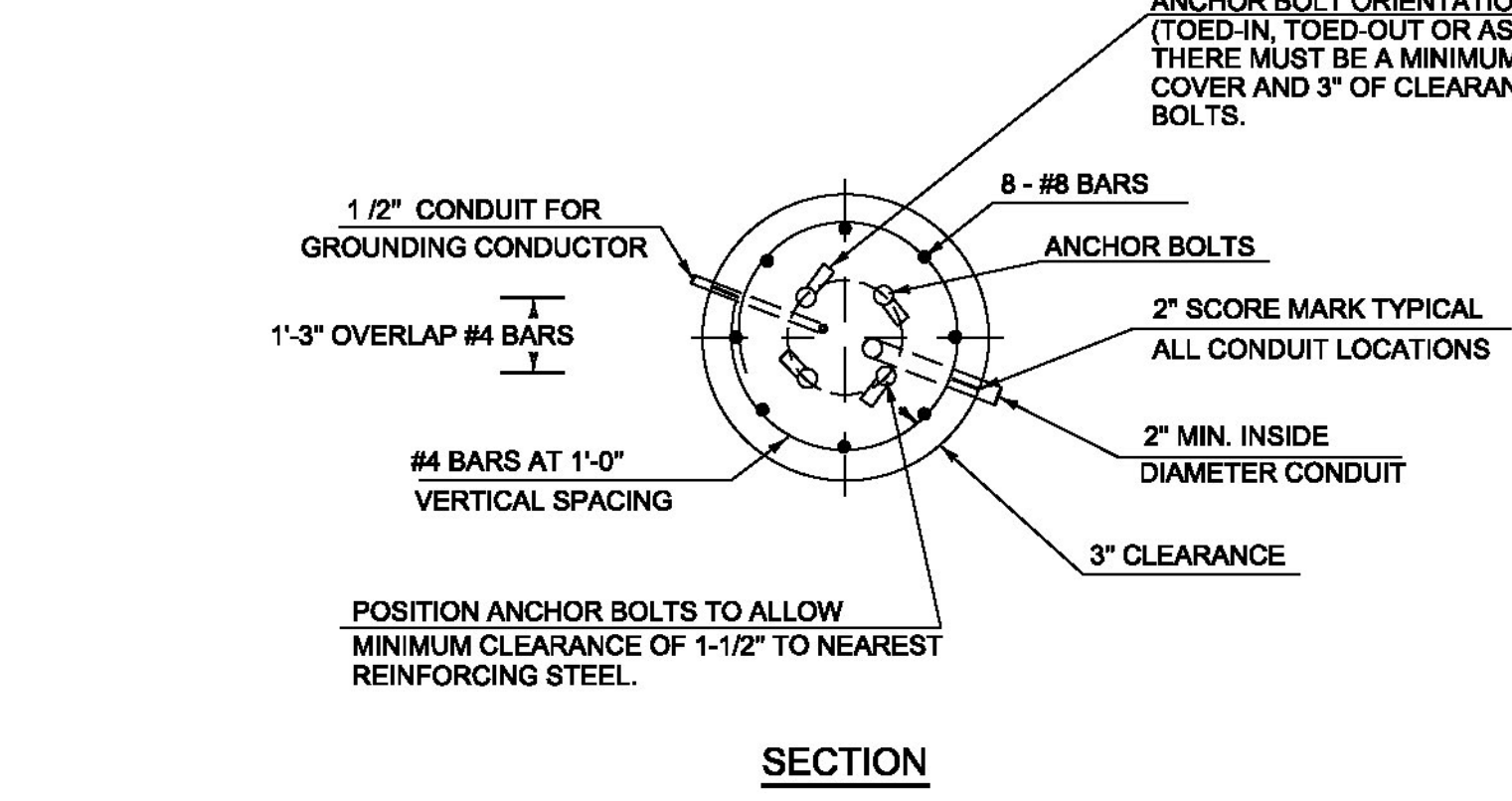
MAP1 & MAP2

- ③ POLE BASE DIAMETER
- ④ POLE GAUGE
- ⑤ POLE TAPER RATE

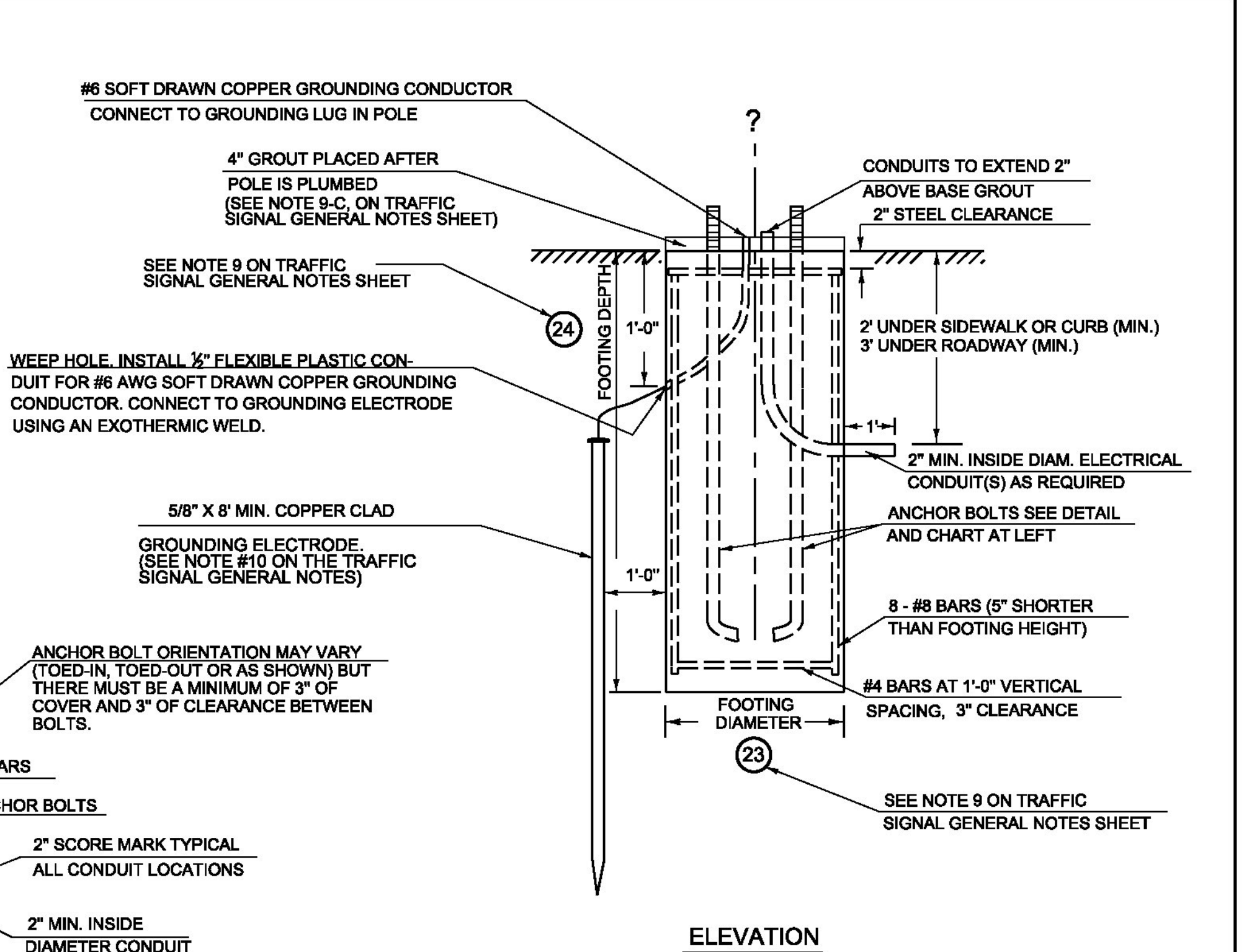
- ⑩ ARM B DIAMETER
- ⑪ ARM B GAUGE
- ⑫ ARM B TAPER RATE
- ⑬ ARM A DIAMETER
- ⑭ ARM A GAUGE
- ⑮ ARM A TAPER RATE



ANCHOR BOLT DETAIL		
SIZE	L (IN)	T (IN)
1 - 1/4" X 48"	42	8
1 - 1/2" X 60"	54	9
1 - 3/4" X 90"	84	9
2" X 96"	96	9

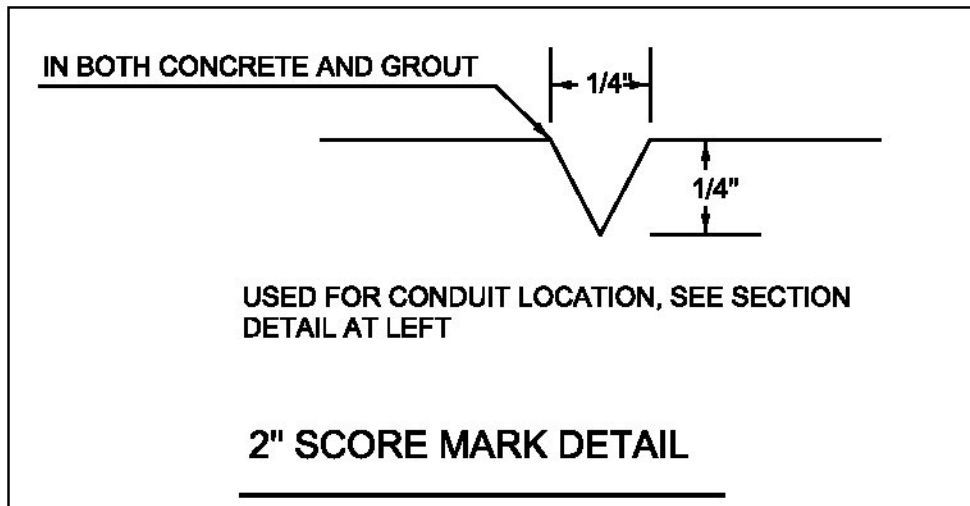


CANTILEVER FOOTING DETAIL (DRILLED SHAFT)

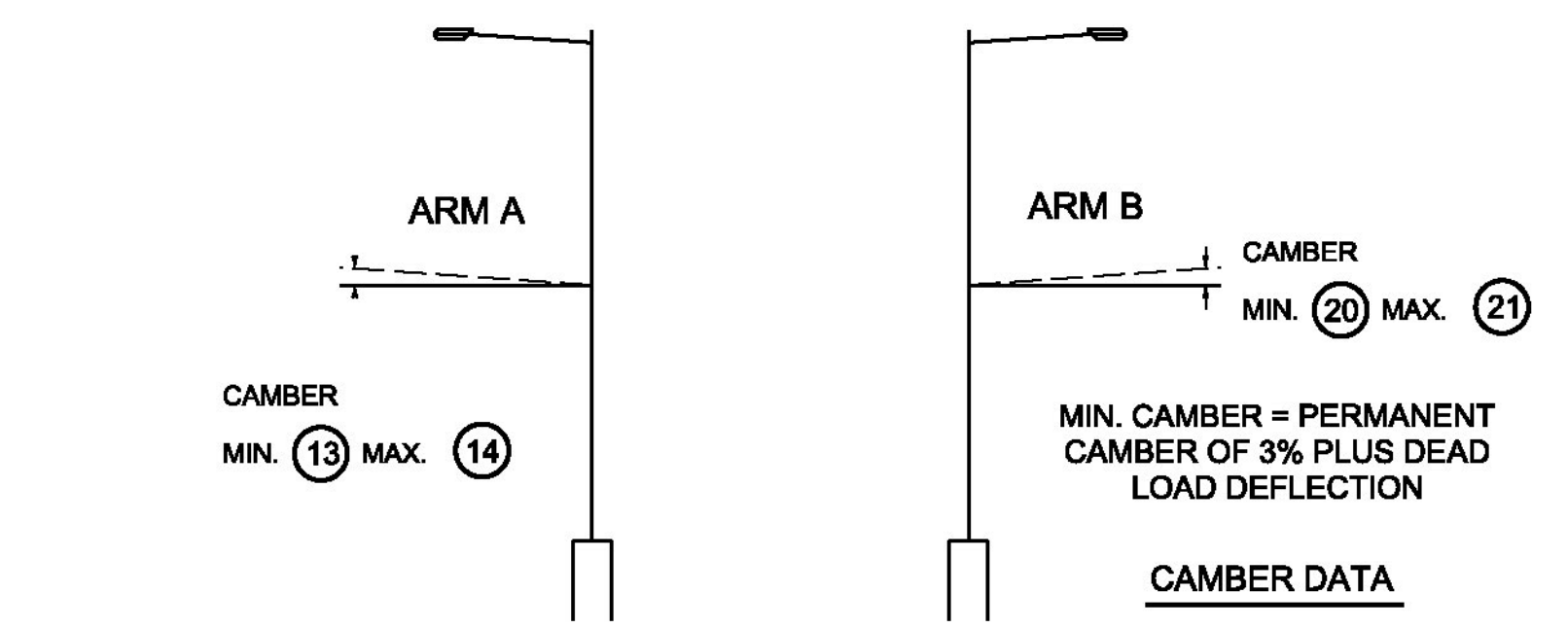


ELEVATION

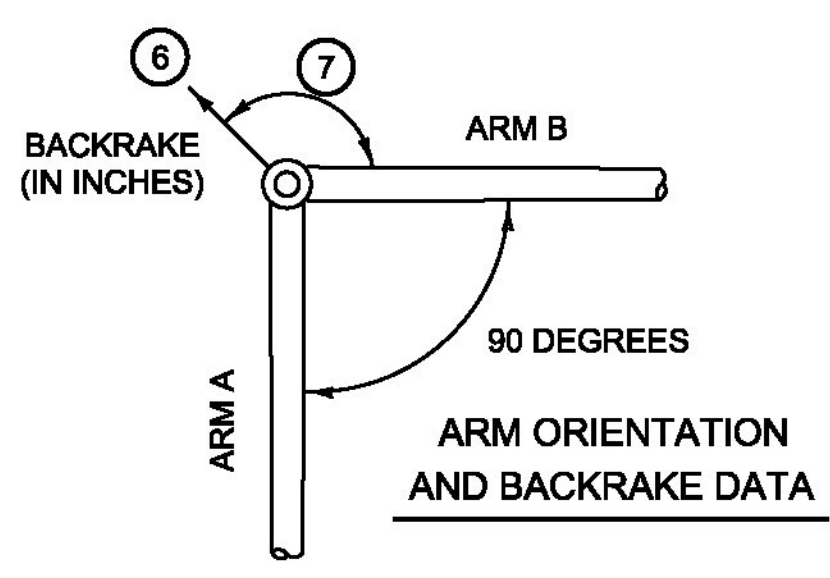
N.T.S. (TYP.)



2" SCORE MARK DETAIL

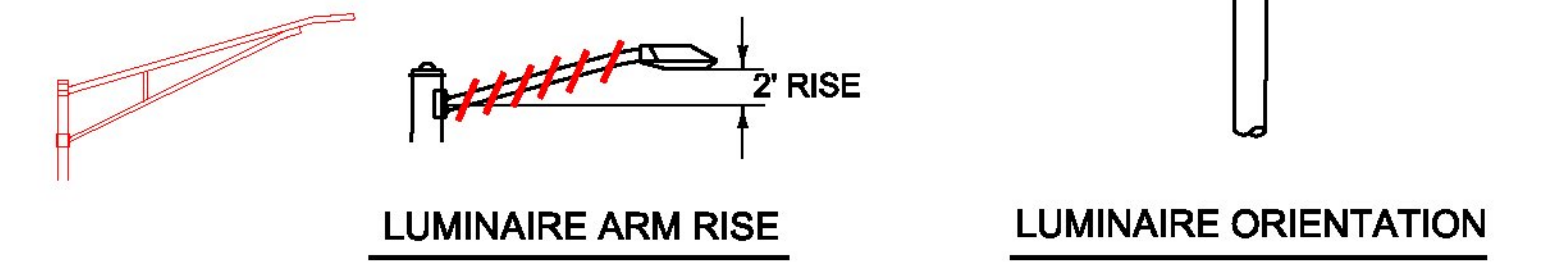


CAMBER DATA



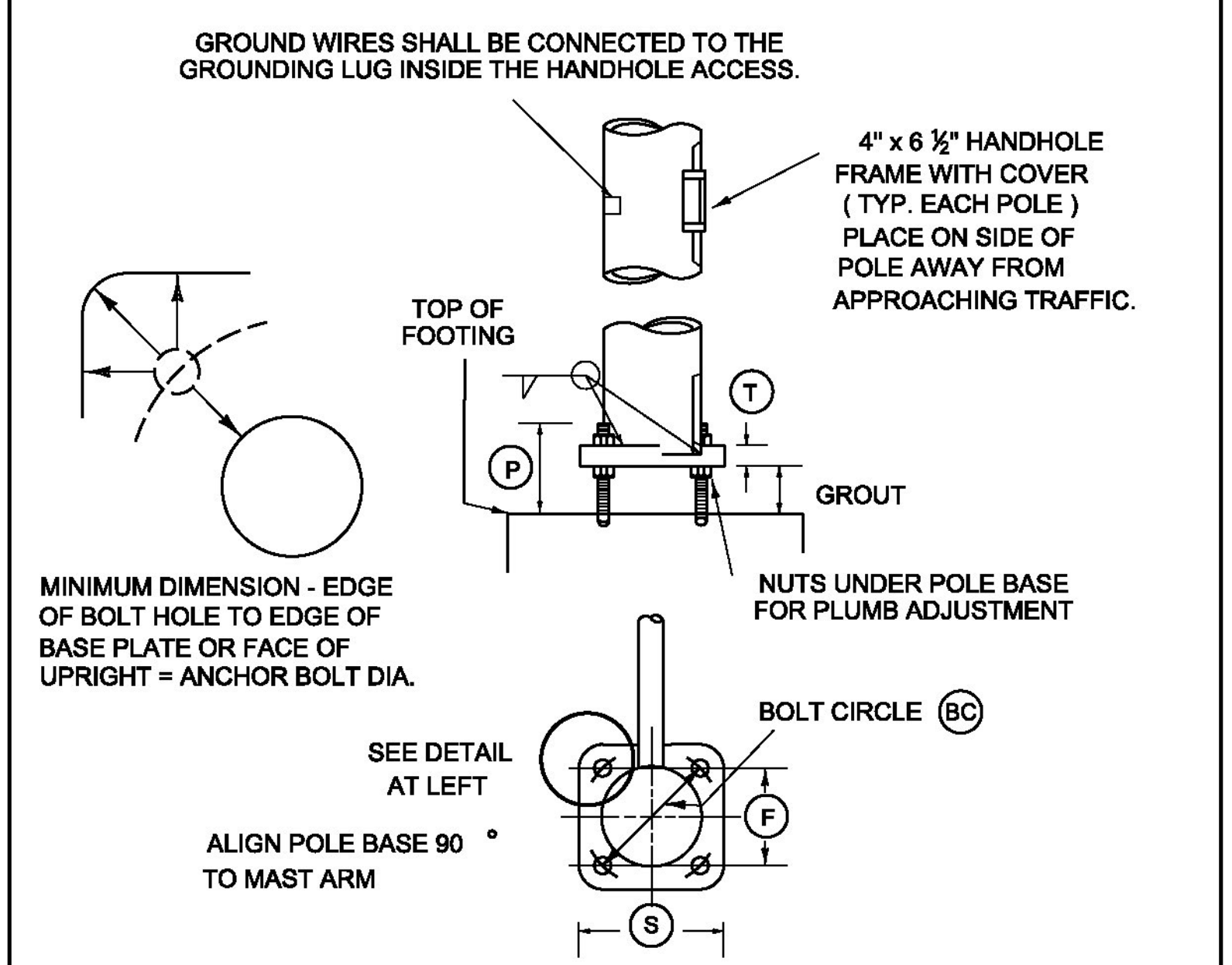
ARM ORIENTATION AND BACKRAKE DATA

REFER TO SUBMITTAL DATED JUNE 16, 2016 FOR ARM DIMENSIONS



LUMINAIRE ARM RISE

LUMINAIRE ORIENTATION



POLE BASE AND BASE PLATE DETAIL

POLE	POLE DATA							ARM DATA														FOOTING DATA		BASE PLATE / BOLT DATA					
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	BC	F	S	T	P	ANCHOR BOLT SIZE	
MAP1	20	20						30																					
MAP2	29	19						40																					

NOTE: DETAILS NTS

# DOUBLE MAST ARM CANTILEVER FOOTING DETAIL SHEET

PROJECT NAME: FERRISBURGH  
 PROJECT NUMBER: NHG SGNL(42)  
 FILE NAME: +13b016frm.dgn  
 PROJECT LEADER: I. DEGUTIS  
 DESIGNED BY: I. DEGUTIS  
 MAST ARM POLE DETAILS  
 PLOT DATE: 3/2/2016  
 DRAWN BY: I. DEGUTIS  
 CHECKED BY: P. COBURN  
 SHEET 21 OF 22

# STREET LIGHTING GENERAL NOTES

## A. CONCRETE BASES

1. WHEN CONCRETE BASES ARE INSTALLED IN SLOPING GROUND, THE GREATEST EXPOSED HEIGHT TO KEEP ALL OF THE TOP ABOVE GROUND MUST BE DOUBLED AND THEN ADDED TO THE MINIMUM DEPTH FOR THE TOTAL BASE DEPTH.
2. CARE SHOULD BE TAKEN WHERE CONCRETE BASES, DRAINAGE STRUCTURES OR UTILITIES ARE CLOSE TOGETHER.
3. THE OFFSET FOR CONCRETE BASES (FACE OF CURB OR EDGE OF PAVEMENT TO CENTER OF CONCRETE BASE) SHALL BE A MINIMUM OF 2'-6" OR AS OTHERWISE NOTED ON THE PLANS.

## B. POLES, ANCHOR BASES AND ARM

1. ALL NEW STREET LIGHTING EQUIPMENT SHOULD BE ALUMINUM, PAINTED FLAT BLACK TO MATCH THE TRAFFIC SIGNAL EQUIPMENT.
2. ALL STREET LIGHT POLES SHALL HAVE A FRANGIBLE OR BREAKAWAY DEVICE (TRANSFORMER BASE, UNLESS NOTED ON THE PLANS).
3. UTILIZE APPROVED DUAL-RATED PARALLEL TAP CONNECTOR WITH INSULATING COVER TO TAPS AT POLE BASES.

## C. LUMINAIRES

1. LUMINAIRES SHALL BE L.E.D. TYPE.
2. POLE-MOUNTED LUMINAIRES SHALL BE ONE OF THE FOLLOWING:
  - BETA LEDWAY IP SERIES
  - HOLOPHANE LEDgends SERIES
  - LRL LED #SAT-96M SERIES
3. ALL POLE-MOUNTED LUMINAIRES SHALL BE SAME, A MIX OF FIXTURES WILL NOT BE ALLOWED. NO LUMINAIRE SUBSTITUTIONS SHALL BE ALLOWED.
4. ALL POLE-MOUNTED LUMINAIRES MUST BE EQUIPPED WITH BIRD SPIKES ON THE TOP.
5. ALL LUMINAIRE HOUSINGS SHALL BE PAINTED FLAT BLACK.

## D. WIRE

1. ALL WIRING BETWEEN THE METER AND/OR POWER SOURCE AND THE FIRST POLE AND/OR PULLBOX AND BETWEEN POLES AND/OR PULLBOXES SHALL BE COPPER AND SIZE AS SPECIFIED ON THE PLANS. ALL WIRE SHALL HAVE TYPE XHHW INSULATION OR EQUIVALENT.
2. CIRCUIT CONDUCTORS SHALL BE CLEARLY IDENTIFIED BY CORROSION RESISTANT TAGS INDICATING CIRCUIT NUMBER AND PANEL SOURCES AT EVERY POLE BASE AND HANDHOLE.

## F. GROUNDING

1. ALL CONDUITS MUST INCLUDE A GROUNDING CONDUCTOR. RIGID STEEL CONDUIT SHALL BE PROPERLY CONNECTED AT THE JOINTS SO AS TO BE WATERTIGHT AND MAINTAIN ELECTRICAL CONTINUITY AND HAVE GROUNDING BUSHINGS SO AS TO ACT AS A GROUNDING CONDUCTOR.
2. THE GROUNDING CONDUCTOR SHALL BE CONTINUOUS.
3. ALUMINUM WIRE SHALL NOT BE USED FOR GROUND WIRE.

## G. PULLBOXES AND HANDHOLES

1. POLYMER CONCRETE AND REINFORCED FIBERGLASS U.L. LISTED PULLBOXES AND HANDHOLES SHALL BE INSTALLED WITH HEAVY DUTY COVERS.
2. ALL CONNECTIONS IN HANDHOLES SHALL BE MADE WITH INSULATED WATERPROOF MECHANICAL SCREW-TYPE CONNECTOR SUITABLE FOR DIRECT BURIAL. NO BARE OR COMPRESSION TYPE CONNECTORS MAY BE USED.
3. THE LOGO ON PULLBOX COVER SHALL BE "LIGHTING".

## H. GENERAL

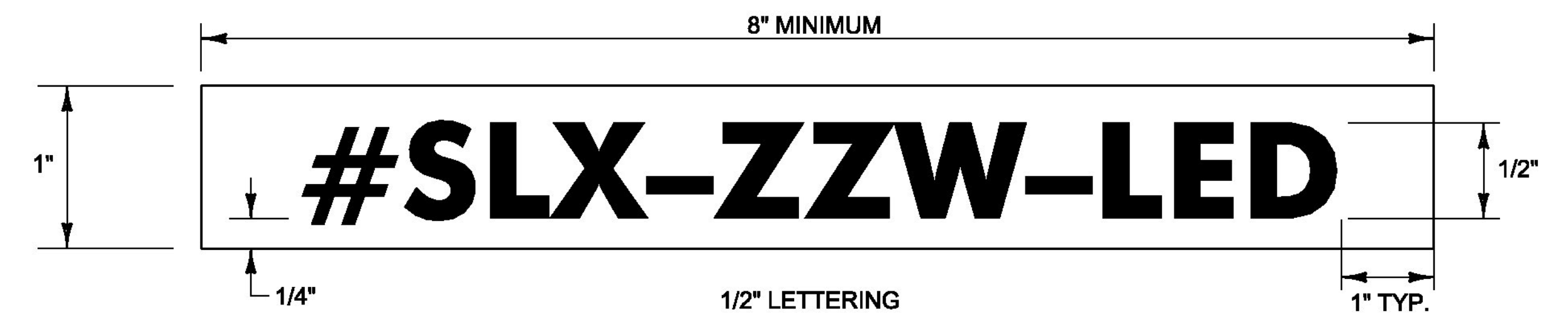
1. THE LOAD ON EACH BRANCH OF A THREE WIRE CIRCUIT SHALL BE AS BALANCED AS POSSIBLE. LOAD TO NEUTRAL.
2. THE CONTRACTOR SHALL ACQUIRE ALL NECESSARY PERMITS AND MAKE ALL NECESSARY ARRANGEMENTS WITH THE UTILITY COMPANY TO PROVIDE A PERMANENT POWER SUPPLY TO THE STREET LIGHTING SYSTEM. IF APPLICABLE, THE ROUTING OF POWER TO THE SYSTEM SHALL BE SUCH THAT THE AGENCY OF TRANSPORTATION HAS FULL RESPONSIBILITY FROM THE TRANSFORMER THROUGH THE LIGHTING SYSTEM. NO INTERVENING OWNERSHIP OR RESPONSIBILITY SHALL BE ALLOWED.
3. ALL CONNECTING HARDWARE (NUTS, BOLTS, ETC.) SHALL BE STAINLESS STEEL UNLESS REQUIRED TO BE OTHERWISE BY CODE.
4. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES AND SHALL BE INSTALLED IN ACCORDANCE WITH SUCH LISTINGS.
5. ALL MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL CODES, REGULATIONS AND REQUIREMENTS OF ALL MUNICIPAL, STATE, FEDERAL AND OTHER PUBLIC OR PRIVATE AUTHORITIES WHICH HAVE JURISDICTION. IN EACH CASE, CODES ARE MINIMUM REQUIREMENTS.

## I. ILLUMINATION REQUIREMENTS

1. AT INTERSECTIONS, LIGHTING LEVELS AS MEASURED AT THE ROADWAY SURFACE SHALL HAVE AN AVERAGE MAINTAINED ILLUMINANCE OF 1.3 FOOT-CANDLES.

## J. POWER CYCLES AND PHOTOELECTRICS

1. EACH STREET LIGHT SHALL BE CONTROLLED BY A SINGLE PHOTOEYE.



LEGEND: BLACK OR WHITE (NON-REFLECTIVE) - STAMPED PRIOR TO PRINTING/PAINTING. BACKGROUND: NATURAL ALUMINUM OR FLAT BLACK SURFACE, THE SAME AS POLE FINISH.

## NOTES:

1. THE TAG SHALL BE MOUNTED ON ALL STREET LIGHT POLES IN SUCH A MANNER AS NOT TO BE EASILY REMOVED, SUCH AS WELDED, RIVETED, OR BOLTED WITH VANDAL PROOF BOLTS.
2. THE LETTERS SHALL BE PUNCHED, STAMPED, ENGRAVED, OR PHOTO-ETCHED. PUNCHING, STAMPING OR ENGRAVING SHALL PENETRATE AT LEAST 1/2 THE BASE MATERIAL THICKNESS.
3. THE BASE MATERIAL FOR THE TAG SHALL BE ALUMINUM WITH A MINIMUM THICKNESS OF 0.10 INCHES.
4. THE TAG SHALL BE ATTACHED TO THE POLE ABOVE THE HANDHOLE, 6 INCHES MAXIMUM, IF THE POLE HAS A TRANSFORMER BASE, ATTACH TAG TO COVER.
5. FIXTURE TAG CHARACTER "X" SHALL BE THE DESIGNATED SL NUMBER AS SHOWN ON THE LIGHTING PLANS.
6. FIXTURE TAG CHARACTER "ZZ" SHALL BE THE WATTAGE OF THE LUMINAIRE

## DETAIL FOR TAGS ATTACHED TO STREET LIGHT POLES

NOT TO SCALE

PROJECT NAME: FERRISBURGH  
PROJECT NUMBER: NHG SCNL(42)

FILE NAME: t13b016frm.dgn PLOT DATE: 3/2/2016  
PROJECT LEADER: I. DEGUTIS DRAWN BY: I. DEGUTIS  
DESIGNED BY: I. DEGUTIS CHECKED BY: P. COBURN  
STREET LIGHTING DETAILS & NOTES SHEET 22 OF 22

**APPROVED** as noted  
By Ian Degutis at 6:48 pm, Jun 21, 2016

DATASHEET 

## NEMA Cabinet Comparison



One of the most extensive lines of weatherproof NEMA traffic cabinets designed for ultimate ease in configuration and installation.

### About NEMA Cabinets

Often the first interactions that motorists, pedestrians, and bicyclists have with ITS take place at signalized intersections – where the signals and cabinets represent the front lines of signalized roadways. Econolite offers an extensive, high quality line of NEMA TS1 and TS2 cabinets, built specifically for traffic applications.

Econolite's line of traffic control cabinets are designed and manufactured for rigid pole base or pedestal mounting - zero flex and completely weather proof. Econolite cabinets are manufactured from high-quality, 5052-H32 aluminum.

The design incorporates a door opening that is 80 percent of the front surface for easy access to the traffic controllers and racks. Econolite also accommodates a specified painted finish with a minimum 2 mm thickness powder coating process for extreme durability.

### At A Glance

- Plug-N-Go "Power Bus" assembly centralizes power terminations with plug-in connectors simplifying installation and providing flexibility for future expansion with virtually no rewiring
- Modular design and components for ease of maintenance and field upgrades
- Door openings are 80 percent of front surface for greater access to equipment, reducing maintenance time and simplifying diagnostics

**APPROVED**

By Ian Degutis at 6:50 pm, Jun 21, 2016

DATASHEET 

# ASC/3 Series NEMA TS2/Actuated Controllers



The ASC/3 was designed using the latest electronics technology, which offers the user a controller that is more reliable, easier to maintain, and interchangeable.

## About ASC/3

The traffic signal controller is one of the most important components of a transportation system. Playing a crucial role in the safety and management of traffic, its importance is undeniable. The controller is also at the heart of any intelligent transportation system (ITS), enhancing transportation efficiency and safety.

The ASC/3 builds upon the proven software, design flexibility, and unique feature set of Econolite's popular ASC/2 family of controllers. All firmware in the ASC/3 is stored in flash memory. This allows for quick and easy intersection programming and software updates in the field without changing hardware or extensive training. The ASC/3 firmware is easily updated in the background while the intersection remains in operation. Once updated, the controller only needs to be power cycled to allow the new firmware to take control. The majority of the electronic components of the ASC/3 are contained in one easy-to-replace module.

## At A Glance

- Windows-based remote user interface (optional)
- Advanced controller, coordinator, and preemptor features
- Enhanced transient and environmental protection
- Protocol support for ECPIP, NTCIP, and AB3418
- Software support for **Centracs**® and **Aries**®, and any compliant pre-qualified applications
- 16 x 40 LCD display with adjustable contrast

**APPROVED**  
By Ian Degutis at 9:20 am, Jun 24, 2016

# MMU2-16LE SmartMonitor™

## MMU2-16LEip SmartMonitor™



The MMU2-16LE SmartMonitor® series Malfunction Management Unit (MMU) exceeds all the requirements set forth in the NEMA Standard TS-2-2003 (R2008)

### About the MMU2-16LEip-RM

The MMU2-16LE series includes two large area Liquid Crystal Displays (LCD) for a continuous Full Intersection display. A separate graphical LCD provides a menu driven interface to status, signal voltages, configuration, event logs, and the integrated context sensitive Help System.

The built-in Setup Wizard ensures that the enhanced monitor programming is done quickly and accurately, even by a novice. The industry first patented Diagnostic Wizard automatically pinpoints malfunctioning signals and offers trouble shooting advice.

An Ethernet or EIA-232 port is used to communicate with a Personal Computer or Traffic Management Center using field proven EDI ECom software.

- #### At A Glance
- A key component for safer traffic control
  - The MMU-16LEip model replaces the standard EIA-232 port with a 10/100 Mbps Ethernet port for remote communications with a Traffic Management Center
  - Meets the new MMU2 Standard and MUTCD Requirements
  - Full intersection LCD back-lighted signal display
  - Built-in Set up Wizard automatically configures enhanced parameters

# PS-200 TS2 Cabinet Power Supply

**APPROVED**

By Ian Degutis at 6:53 pm, Jun 21, 2016



The PS-200 unit, which supplies regulated DC power, unregulated AC power, and a line frequency reference for the Detector Rack, BIUs, load switches, and other auxiliary equipment.

## About the PS-200

The PS-200 cabinet power supply is a shelfmounted unit, which supplies regulated DC power, unregulated AC power, and a line frequency reference for the detector rack, BIUs, load switches, and other auxiliary equipment. The PS-200 meets all requirements of the NEMA TS2-2003 standard.

All TS-2 Type 1 cabinet assemblies require the use of this unit, as well as any TS-2 Type 2 cabinet assemblies that utilize Bus Interface Units (BIU).

Each PS-200 cabinet power supply is put through a rigorous quality program and tested under the extreme environmental conditions experienced on the street.

## At A Glance

- The PS-200 provides four outputs rated over the full -30°F to 165°F (-34°C to +74°C) NEMA operating temperature range:
  - +12 VDC rated at 2 Amps
  - +24 VDC rated at 2 Amps
  - 12 VAC rated at 0.25 Amps
  - 60 Hz Line Frequency Reference rated at 50 mAmps
- Input Voltage Operating Range is 89 VAC to 135 VAC at 60 Hz

**APPROVED**

By Ian Degutis at 6:54 pm, Jun 21, 2016

DATASHEET 

## Bus Interface Unit (BIU)



### About the BIU

It is required in all TS2 Type-1 cabinets and in TS2 Type-2 cabinets when controller I/O interface is through the SDLC bus, not via TS1 MS-A, B, and C connectors.

Physically, the *BIU-64* consists of a circuit board and a front panel. A male 64-pin DIN 41612 type-B series connector provides the connection to the backplane of the rack. A female 15-pin metal shell D subminiature connector with latching blocks provides the connection to the SDLC cable. The front panel provides separate indicator lights for Power, Transmit, and Valid Data. It also provides a handle for easy removal of the unit from the rack. A separate TS2 cabinet power supply provides the required 24 VDC power plus a 60 Hz line-timing reference.

### At A Glance

- Exceeds BIU requirements of NEMA TS2-2002
- Interfaces detectors, load switches, and 24V signals to TS2 Port-1 SDLC bus
- Used in all TS2 Type-1 cabinets for Terminal and Facilities plus Detector Racks
- Used in TS2 Type-2 for Detector Racks
- Fully hot-swappable
- Separate Power, Transmit, and Valid Data LED indicators display DC power and port status

**ECONOLITE**

**APPROVED**

By Ian Degutis at 6:55 pm, Jun 21, 2016

DATASHEET 

## TMIB Cabinet Interface



*Econolite's TMIB cabinet interface is a TEES/TS2 detector card for a standard detector card rack or shelf-mount enclosure.*

### About the TMIB

The TMIB connects up to four AccuScan forward-fire radar units to a traffic controller in the cabinet. The TMIB also facilitates Ethernet-based setup and monitoring communications from a PC to the radar units. Easy to install and set-up, the TMIB manages outputs from radar units around the intersection. Non-volatile memory retains the detector configuration, which can also be saved to a computer or restored from a saved file.

For the traffic controller, valid detection and output of up to 64 objects can facilitate optimal signal timing. Up to 16 wired open-collector outputs or up to 64 SDLC-protocol based outputs provide all the demand information that a modern traffic controller needs in an ITS solution. The TMIB interfaces detector outputs directly to NEMA TS1/TS2, TEES Type 170/179, or 2070 ATC traffic controllers, including SDLC when the controller software supports it in all cabinet types.

### At A Glance

- Stop Line, Dilemma Zone, or Advanced vehicle detection
- Cost Effective & Superior Value
- Loop replacement (non-intrusive detection)
- Presence or Pulse Outputs
- Custom trigger conditions
- Easy to install and configure
- Reliable Performance
- Minimal Maintenance
- Low Power Consumption
- 100Base-TX Ethernet to network
- 170/2070, TS1 & TS2 Controller Support

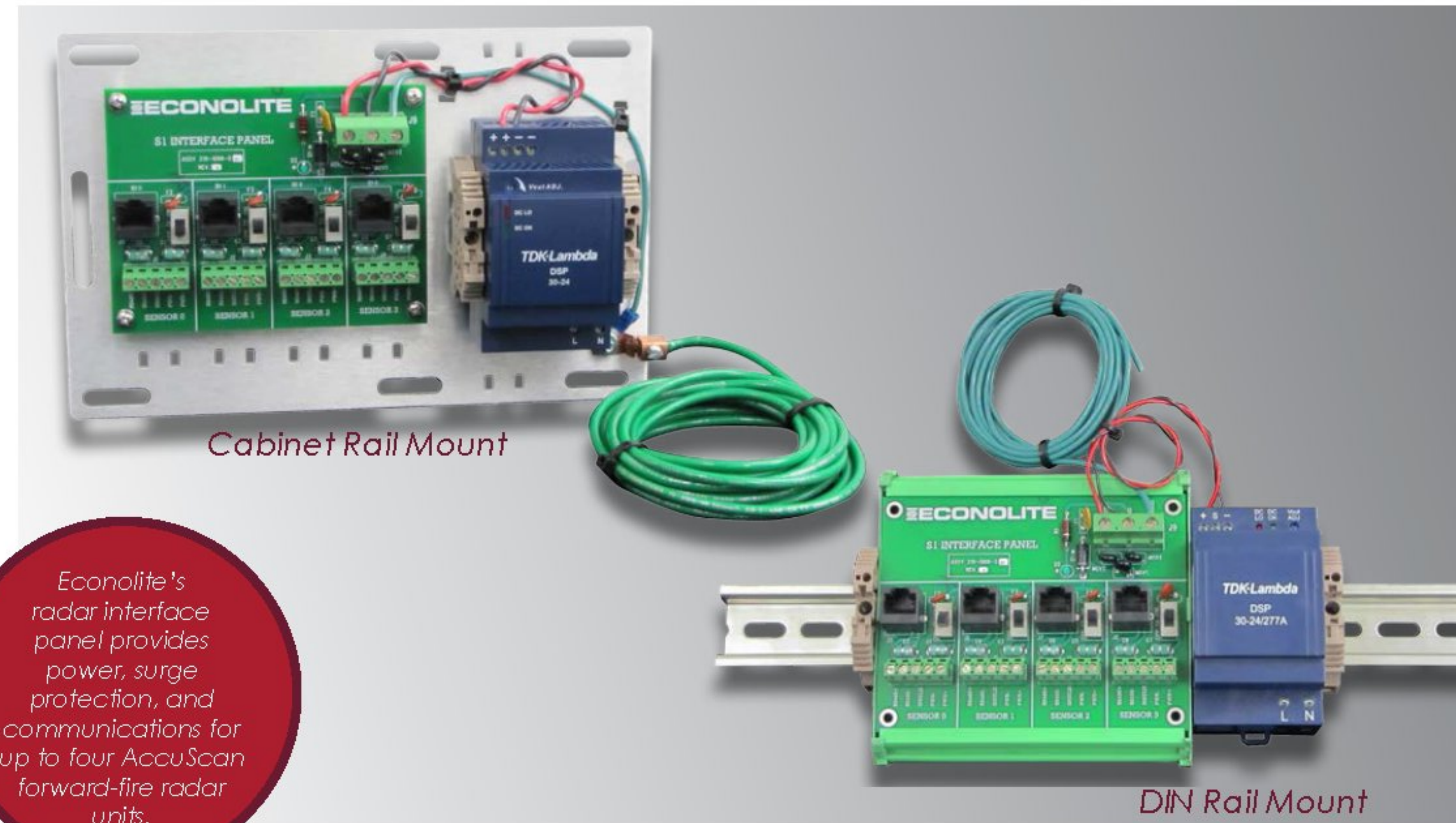
**ECONOLITE**

**APPROVED**

By Ian Degutis at 6:56 pm, Jun 21, 2016

DATASHEET 

## Radar Interface Panels



Econolite's radar interface panel provides power, surge protection, and communications for up to four AccuScan forward-fire radar units.

### About the Interface Panels

Econolite's radar interface panels provide power, surge protection, and communications for up to four AccuScan forward-fire radar units. Typical installation includes a TMIB cabinet interface that provides Ethernet connectivity to the radar units. Direct RS-485 serial communications from the panel to the radar units is also possible. On the interface panel, each radar unit has its own power switch.

Easy to install and set-up, the radar interface panel provides a mechanical place to land cables coming from outside the cabinet and multiple layers of electrical surge suppression to help protect other cabinet equipment from outside surges and noise. Protection includes transformer isolation, MOV, gas discharge tubes, diode isolation, and resettable fuses. Power is 110 or 220 VAC to the replaceable power supply on the interface panel, typically wired from the protected side of the cabinet power distribution. No supplemental surge suppression will be required.

This small-footprint interface panel is available for cabinet rail or DIN rail mounting. A power LED indicates when the interface panel is active.

### At A Glance

- Supports 1 to 4 AccuScan sensors
- Surge suppression and communications distribution
- Isolates TMIB from outside cabling
- Easy to install and wire
- DIN rail or cabinet rail mount
- Reliable Performance
- Minimal Maintenance
- LED power indicator
- Low Power Consumption
- TEES and NEMA compliant

**ECONOLITE**

**APPROVED**

By Ian Degutis at 6:57 pm, Jun 21, 2016

DATASHEET 

# AccuScan 300



*The advanced capabilities of radar-based detection far outweigh the simplicity of inductive loops.*

## About AccuScan 300

The cornerstone of any ITS program is vehicle detection at a signalized intersection. The key is for accurate, reliable and maintenance free vehicle presence detection at the stop bar. The Econolite AccuScan 300 radar-based detection solution is specifically designed to provide accurate stop bar detection for signalized intersection control. It provides up to six lanes of vehicle detection at up to 344 feet – enabling vehicle queue detection. AccuScan 300 is a forward-fire radar sensor delivering precise sampling measurements on an individual lane bases, ideal for single and multi-phase intersections. AccuScan 300 is an Intelligent Transportation System (ITS) solution with central management software that is convenient for fast integration to existing network infrastructure.

AccuScan 300 works with Econolite's radar sensor configuration and management software (TMConfigurator), which allows for easy sensor setup and programming of detection zones. AccuScan 300 is fully compatible with 170/2070 and NEMA controllers and multiple sensors and can be easily integrated into NEMA or 33X series cabinets using one full-width detector rack-compatible interface module (TMIB).

## At A Glance

- Stop Bar vehicle and bike detection
- By lane detection accuracy
- Loop replacement (non-intrusive detection)
- Flexible installation
- On-board Attitude Sensor simplifies sensor aiming
- Custom trigger conditions
- ETA, Dilemma Zone, Queue Length, and Speed measurement
- Convenient installation wizard
- Geographical Awareness
- RS-485 and 100Base-TX Ethernet interface option
- 170/2070, TS1 & TS2 Interface available

**ECONOLITE**

**APPROVED**

By Ian Degutis at 6:59 pm, Jun 21, 2016

DATASHEET 

# AccuScan 600



*The advanced capabilities of radar-based detection far outweigh the simplicity of inductive loops.*

## About AccuScan 600

Actively managing and controlling traffic at intersections and dilemma zones requires accurate extended vehicle detection from the stop bar to 500 feet before the stop bar. With Econolite's AccuScan 600 radar detection solution, agencies and MPOs can actively manage dilemma zones and intersections based on traffic demand to enhance safety and efficiency even on curved approaches. A single Econolite AccuScan 600 sensor enables up to six lanes of vehicle detection at various distances up to 625 feet from the mounting location of the sensor. By providing vehicle detection out to 625 feet, Econolite AccuScan 600 enables dilemma zone protection, green light extension, ETA, queue, and bicycle detection strategies. AccuScan 600 is an Intelligent Transportation System (ITS) solution with central management software that is convenient for fast integration to existing network infrastructure.

## At A Glance

- Stop Bar and Advance vehicle detection – in one sensor
- Loop replacement (non-intrusive detection)
- Depth by-lane detection accuracy
- On-board Attitude Sensor simplifies sensor aiming
- Flexible installation
- Custom trigger conditions
- ETA, Dilemma Zone, Queue Length and Speed measurement
- Convenient installation wizard
- Geographical Awareness
- 100Base-TX Ethernet interface option
- 170/2070, TS1 & TS2 Interface

**ECONOLITE**

# STR-LWY-4M-HT-IP-02-06

LEDway® IP66 Street Light - Type IV Medium - Horizontal Tenon Mount - 20-60 LEDs

**APPROVED**  
By Ian Degutis at 6:39 am, Aug 05, 2016

**Product Description**

The luminaire is all aluminum construction. Standard luminaire utilizes BetaLED® Technology for power input suitable for #2-#14 AWG wire. Luminaire is designed for mounting on a horizontal tenon or vertical tenon. Luminaire is ordered with XA-XIL25H accessory kit and is adjustable 17.5" to allow for luminaire leveling (two axis T-level included). Horizontal tenon must be minimum 8" (203mm) long.

**Performance Summary**

- Utilizes BetaLED® Technology
- Patented NanoOptic® Product Technology
- Made in the U.S.A. of U.S. and imported parts
- CRI:** Minimum 70 CRI
- CCT:** 5700K (+/- 500K) Standard, 4000K (+/- 300K)
- Limited Warranty†:** 10 years on luminaire/10 years on Colorfast DeltaGuard® finish
- EPA and Weight:** Reference EPA and Weight spec sheet

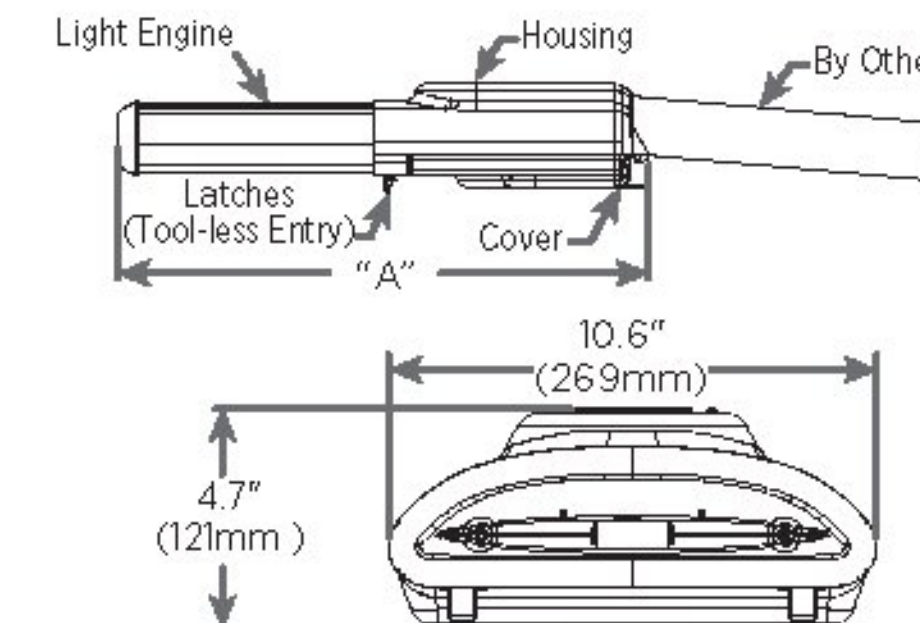
**Accessories**

Field Installed Accessories	
<b>XA-BRDSPK30 (20-30 LEDs)</b>	<b>XA-XSLBLS30 (20-30 LEDs)</b>
<b>XA-BRDSPK60 (40-60 LEDs)</b> Bird Spikes for Light Engine	<b>XA-XSLBLS60 (40-60 LEDs)</b> External Backlight Shield
<b>XA-BRDSPKHSG</b> Bird Spikes for Housing	<b>XA-XIL125IP</b> 1.25" (32mm) IP Pipe Sealing Kit

**Ordering Information**

Example: STR-LWY-4M-HT-02-E-UL-SV-525-IP-OPTIONS

STR-LWY	4M	HT		E				IP -
Product	Optic	Mounting	LED Count (x10)	Version	Voltage	Color Options*	Drive Current	Options
<b>STR-LWY</b>	<b>4M</b> Type IV Medium	<b>HT</b> Horizontal Tenon	<b>02</b> <b>03</b> <b>04</b> <b>05</b> <b>06</b>	<b>E</b>	<b>UL</b> Universal 120-277V <b>UH</b> Universal 347-480V	<b>SV</b> Silver (Standard) <b>BK</b> Black <b>BZ</b> Bronze <b>PB</b> Platinum <b>WH</b> White	<b>525**</b> 525mA <b>700</b> 700mA	<p><b>IP IP66 Classification</b></p> <p><b>40K 4000K Color Temperature</b> - Color temperature per luminaire</p> <p><b>DIM 0-10V Dimming</b> - Control by others - Refer to dimming spec sheet for details - Can't exceed specified drive current</p> <p><b>F Fuse</b> - Not available with all ML options. Refer to ML spec sheet for availability with ML options - When code dictates fusing, use time delay fuse</p> <p><b>HL HI/Low (175/350/525 Dual Circuit Input)</b> - Refer to ML spec sheet for details - Sensor not included</p> <p><b>ML Multi-Level</b> - Refer to ML spec sheet for details</p> <p><b>N No Quick Disconnect Harness or Levelling Bubble</b> - Standard product features unless N option is specified</p> <p><b>PD Power Door</b> - All connections between door and luminaire are shipped unconnected from the factory; door release spring included to open door automatically when the latches are released</p> <p><b>R NEMA Photocell Receptacle</b> - Not available with all ML options. Refer to ML spec sheet for availability with ML options - Photocell by others - Intended for downlight applications at 0° tilt</p> <p><b>SC Door Safety Tether</b> - Stainless steel aircraft cable</p> <p><b>UTL Utility</b> - Includes exterior wattage label that reflects watts for the drive current selected. The ability to exceed selected drive current will be disabled</p>



LED Count (x10)	Dimension	Measurements
02	"A"	17.5" (443mm)
03	"A"	17.5" (443mm)
04	"A"	22.0" (559mm)
05	"A"	22.0" (559mm)
06	"A"	22.0" (559mm)

\* See www.cree.com/lighting/products/warranty for warranty terms.

\* Light engine portion of extrusion is not painted and will remain natural aluminum regardless of color selection. \*\* Available on luminaires with 30-60 LEDs.

# EAST COAST SIGNALS APPROVED FPR SUBMITTAL 8-1-16 MSF

STR-LWY-4M-HT-IP-02-06

## Product Specifications

### CONSTRUCTION & MATERIALS

- Housing is all aluminum construction
- Terminal block for power input suitable for #2-#14 AWG wire
- Luminaire is designed to mount on a 2" (51mm) IP, 2.375" (60mm) O.D. horizontal tenon or 1.25" (32mm) IP, 1.66" (42mm) O.D. horizontal tenon when ordered with XA-XIL125IP accessory kit and is adjustable +/-5" to allow for luminaire leveling (two axis T-level included). Horizontal tenon must be minimum 8" (203mm) long
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Standard is silver. Bronze, black, white, and platinum bronze are also available

### ELECTRICAL SYSTEM

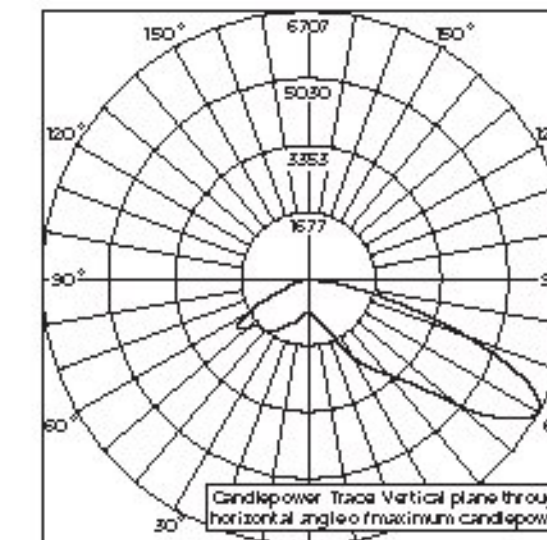
- Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- Power Factor:** > 0.9 at full load
- Total Harmonic Distortion:** < 20% at full load
- Quick disconnect harness suitable for mate and break under load provided on power feed to driver for ease of maintenance
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used

### REGULATORY & VOLUNTARY QUALIFICATIONS

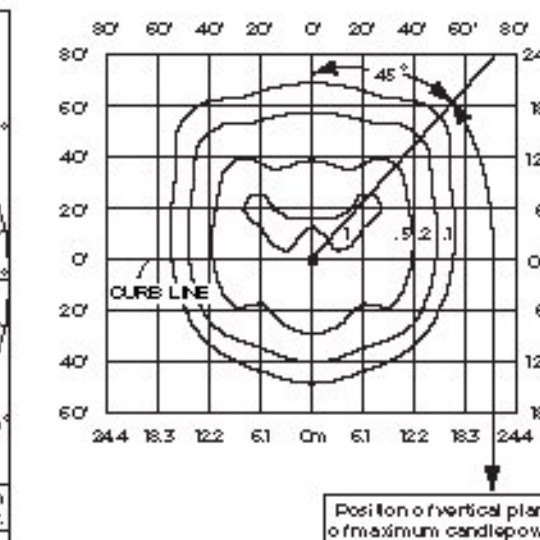
- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R or ML options
- Consult factory for CE Certified products
- Meets CALTrans 611 Vibration testing and GR-63-CORE Section 4.41/5.4.2 Earthquake Zone 4
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Luminaire and finish are endurance tested to withstand 5,000 hours of elevated ambient salt fog as defined in ASTM Standard B 117
- Product qualified on the DesignLights Consortium ("DLC") Qualified Products List ("QPL") when ordered without full backlight control shield
- RoHS Compliant
- Meets Buy American requirements within ARRA

## Photometry

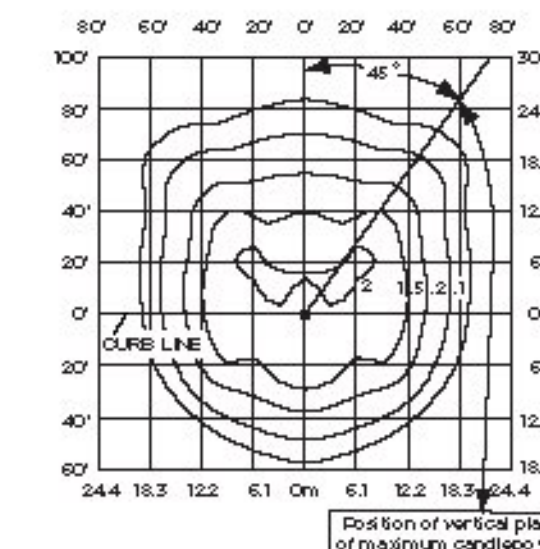
All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP certified laboratory.



CESTL Test Report # 2013-0028  
STR-LWY-4M-\*\*-06-E-UL-700-40K  
Initial Delivered Lumens: 11,036



STR-LWY-4M-\*\*-03-E-UL-700  
Mounting Height: 25' (7.6m) A.F.G.  
Initial Delivered Lumens: 5,907  
Initial FC at grade



STR-LWY-4M-\*\*-06-E-UL-700  
Mounting Height: 25' (7.6m) A.F.G.  
Initial Delivered Lumens: 11,683  
Initial FC at grade

IES Files  
To obtain an IES file specific to your project consult:  
<http://www.cree.com/lighting/tools-and-support/exterior-ies-configuration-tool>

## Lumen Output, Electrical, and Lumen Maintenance Data

LED Count (x10)	Type IV Medium Distribution										50K Hours Projected Lumen Maintenance Factor @ 15°C (59°F)**		
	5700K		4000K		System Watts 120-277V	System Watts 347-480V	TOTAL CURRENT						
	Initial Delivered Lumens	BUG Ratings* Per TM-15-11	Initial Delivered Lumens	BUG Ratings* Per TM-15-11			120V	209V	240V	277V		347V	480V
<b>525mA @ 25°C (77°F)</b>											93%		
03	4,725	B2 U0 G1	4,550	B2 U0 G1	53	55	0.45	0.26	0.23	0.21		0.16	0.13
04	6,313	B2 U0 G1	6,079	B2 U0 G1	66	71	0.56	0.33	0.29	0.26		0.21	0.16
05	7,839	B2 U0 G2	7,549	B2 U0 G2	86	87	0.72	0.42	0.37	0.33		0.25	0.19
06	9,346	B2 U0 G2	9,000	B2 U0 G2	100	103	0.84	0.49	0.43	0.38		0.30	0.22
<b>700mA @ 25°C (77°F)</b>												91%	
02	3,977	B1 U0 G1	3,830	B1 U0 G1	47	51	0.39	0.23	0.21	0.19	0.15		0.12
03	5,907	B2 U0 G1	5,688	B2 U0 G1	70	73	0.59	0.34	0.30	0.27	0.21		0.16
04	7,891	B2 U0 G2	7,598	B2 U0 G2	91	93	0.77	0.45	0.39	0.35	0.27		0.20
05	9,799	B2 U0 G2	9,436	B2 U0 G2	113	115	0.96	0.55	0.48	0.43	0.33		0.25
06	11,683	B3 U0 G2	11,250	B2 U0 G2	134	135	1.13	0.65	0.57	0.50	0.39		0.29

\* For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit [www.iesna.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf](http://www.iesna.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf).  
 \*\* For recommended lumen maintenance factor data see TD-13. Calculated L<sub>80</sub> based on 10,000 hours LM-80-08 testing; > 150,000 hours in accordance with guidelines describing "successors to previously tested subcomponents" (Section 5) per Sep 9, 2011 ENERGY STAR guidelines.  
 See [http://www.energystar.gov/ia/partners/prod\\_development/new\\_spec/downloads/luminaires/ENERGY\\_STAR\\_Final\\_Lumen\\_Maintenance\\_Guidance.pdf](http://www.energystar.gov/ia/partners/prod_development/new_spec/downloads/luminaires/ENERGY_STAR_Final_Lumen_Maintenance_Guidance.pdf).

© 2013 Cree, Inc. All rights reserved. For informational purposes only. Content is subject to change. See [www.cree.com/patents](http://www.cree.com/patents) for patents that cover these products. Cree®, the Cree logo, LEDway®, BetaLED®, NanoOptic®, and Colorfast DeltaGuard® are registered trademarks, and the BetaLED Technology logo is a trademark of Cree, Inc.

[www.cree.com/lighting](http://www.cree.com/lighting)

T (800) 236-6800 F (262) 504-5415





**APPROVED**  
By Ian Degutis at 7:04 am, Jul 20, 2016

**SUBMITTAL OF CALCULATIONS  
FOR VALMONT ALUMINUM POLE ASSEMBLY**

30 FT MH WITH A 12 FT SINGLE TRUSS ARM

PROJECT:  
FERRISBURGH, VT NHG SGNL (42)

CUSTOMER:  
HIGHWAY TECH

VALMONT JOB #:  
A400607

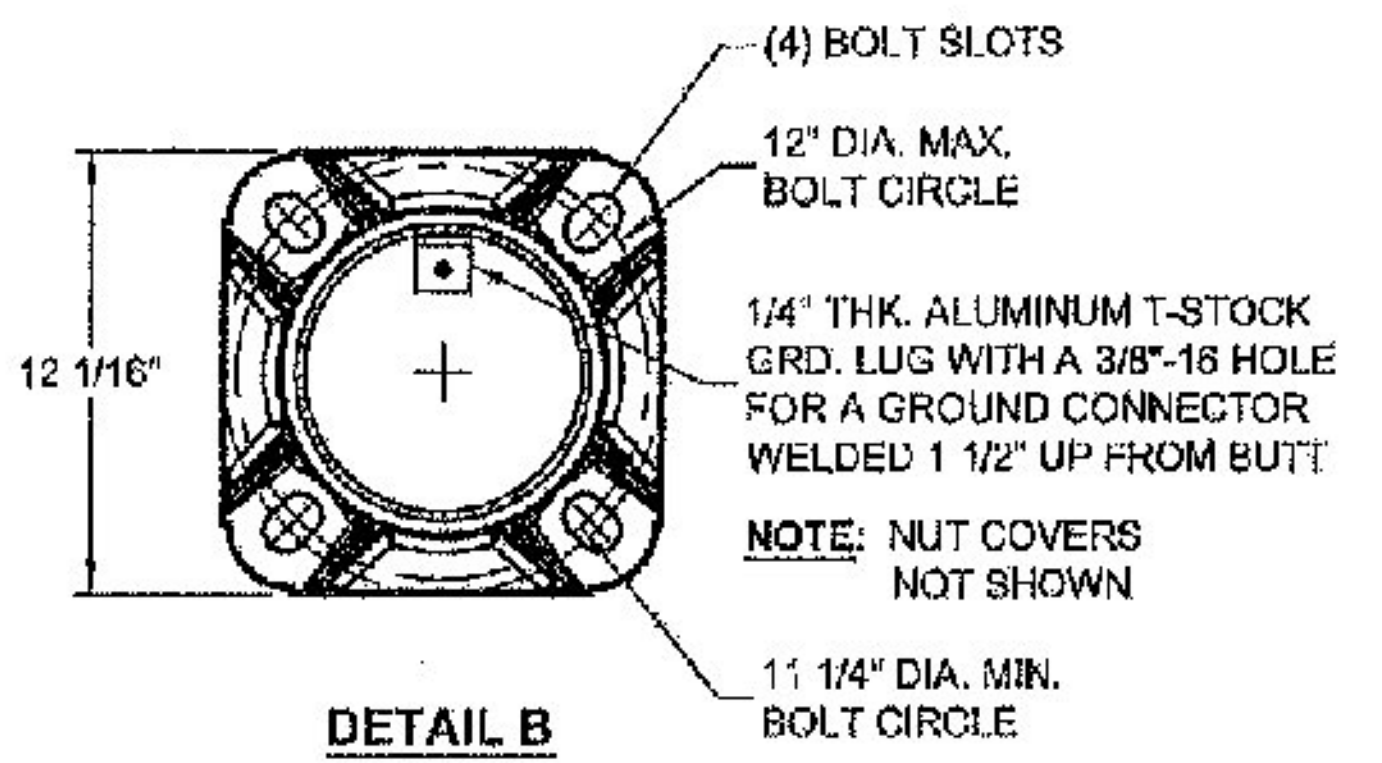
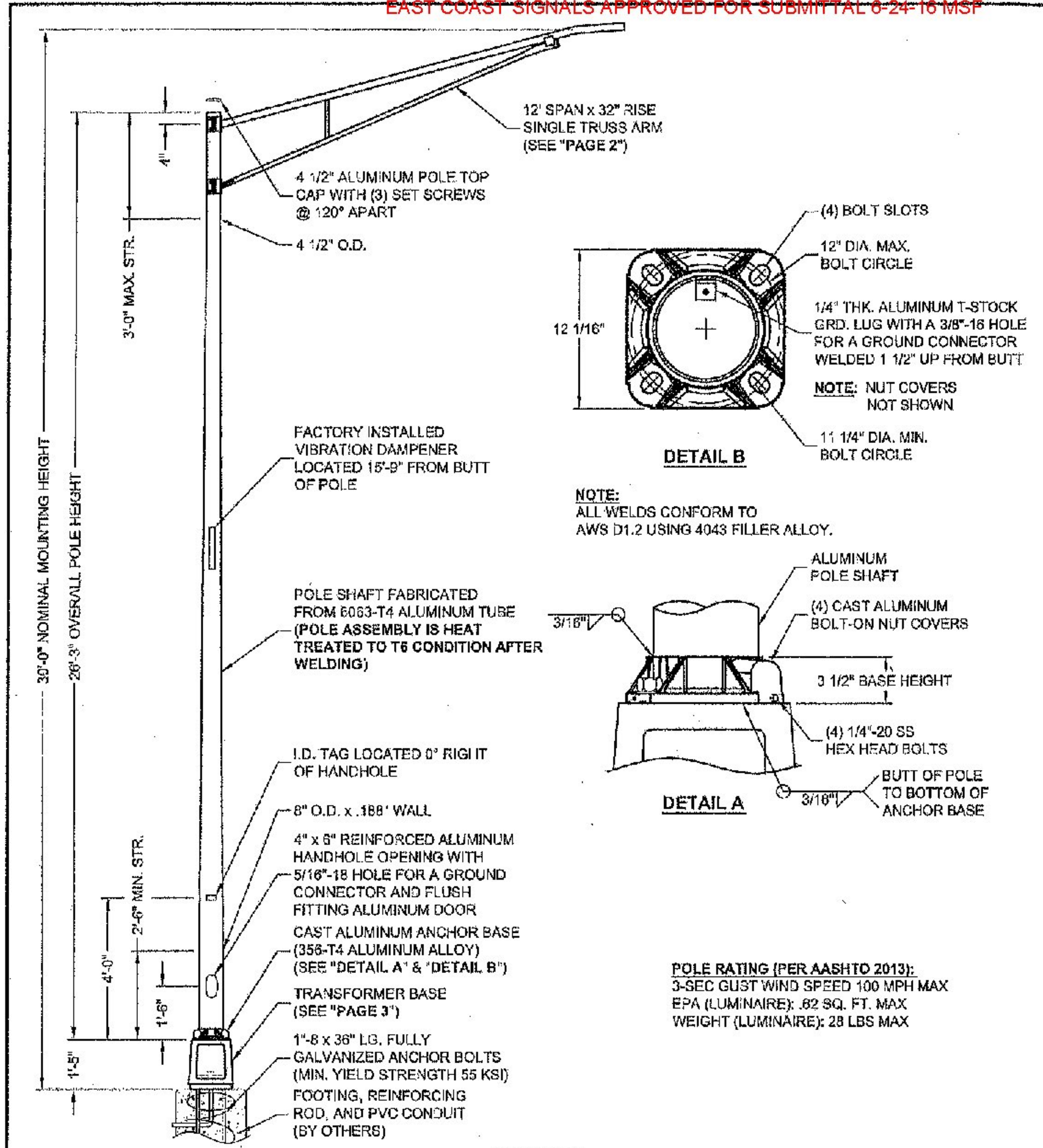
A circular professional engineer seal for Barry N. Sladek, No. 99190, Structural 1, State of Vermont. Below the seal is a handwritten signature of Barry N. Sladek and the date 6/16/16.

STATE OF VERMONT  
BARRY N. SLADEK  
No. 99190  
Structural 1  
LICENSED  
PROFESSIONAL ENGINEER

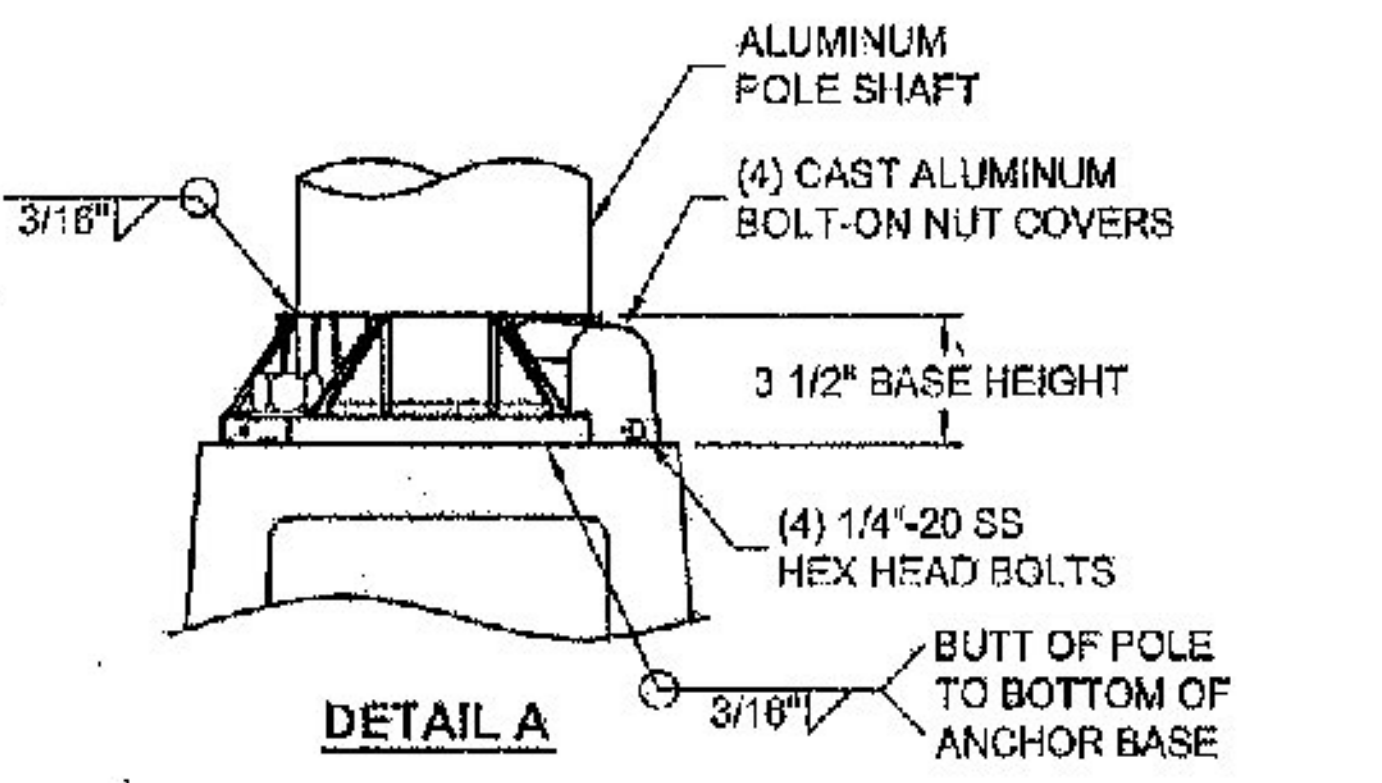
*Barry N. Sladek*  
6/16/16

PREPARED BY:  
JAY BAUMGARTNER

DATE:  
JUNE 16, 2016




NOTE:  
ALL WELDS CONFORM TO  
AWS D1.2 USING 4043 FILLER ALLOY.




POLE RATING (PER AASHTO 2013):  
3-SEC GUST WIND SPEED 100 MPH MAX  
EPA (LUMINAIRE): .62 SQ. FT. MAX  
WEIGHT (LUMINAIRE): 28 LBS MAX

DO NOT SCALE



Valmont Industries, Inc. Structures Division  
20805 Eaton Ave Farmington, Minnesota 55024-7932  
Phone: (851) 463-8950 (800) 893-7577  
Fax: (851) 463-3349

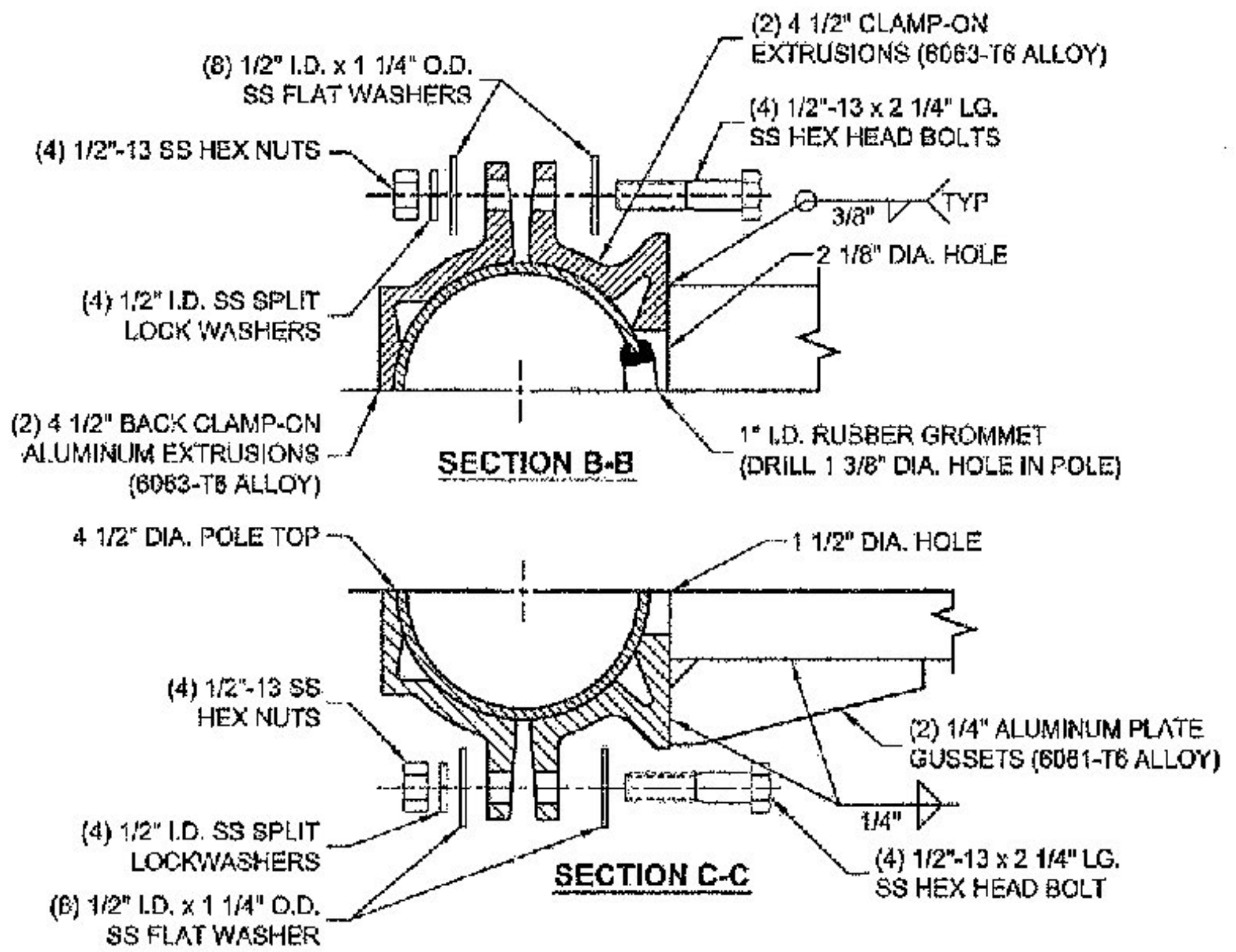
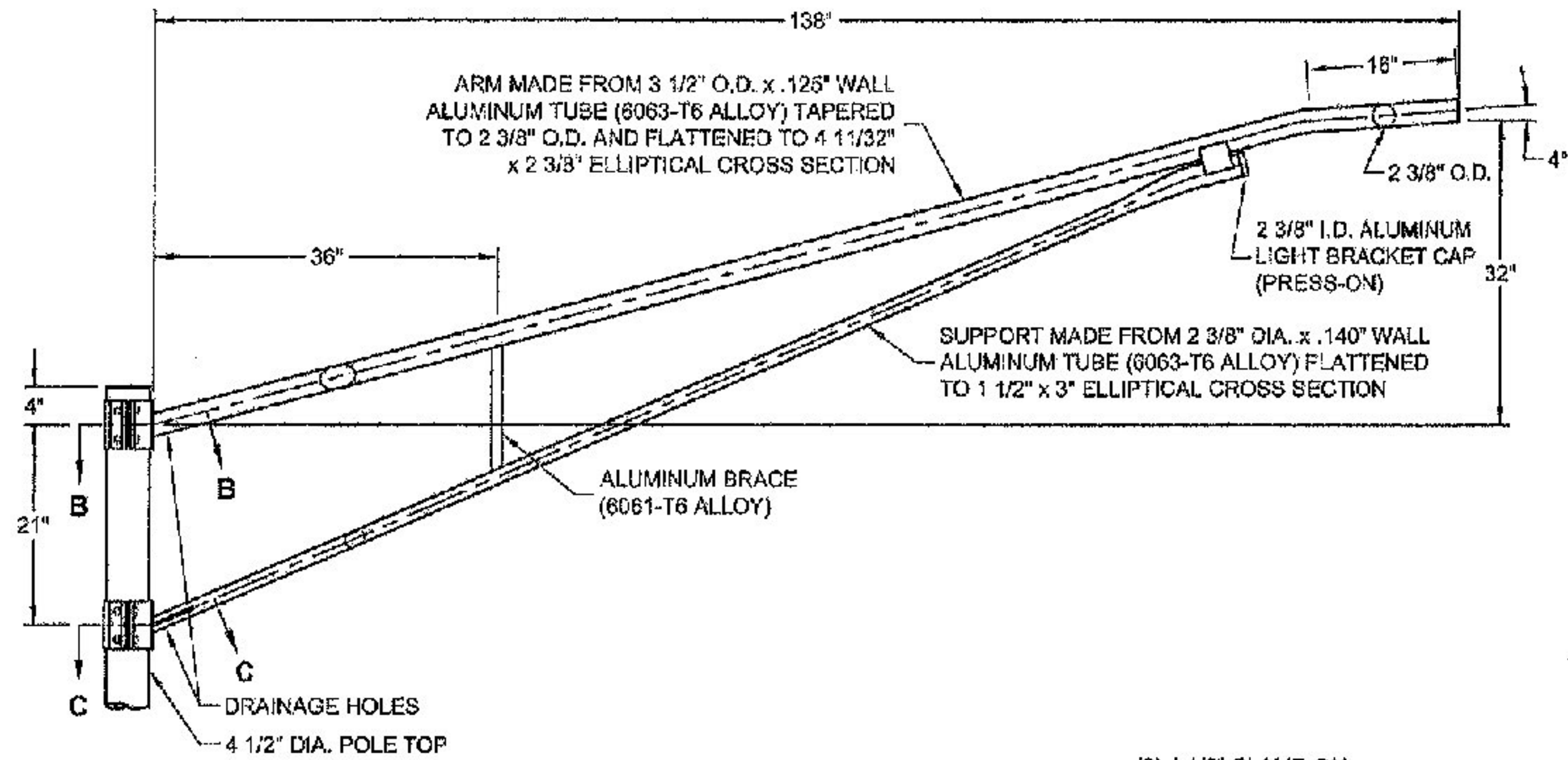
TITLE: S TRANSFORMER BASE POLE		QTY: 2
MODEL NO.: 250345805T4		DRAWN BY: PVB
MATERIAL: ALUMINUM ALLOY		CHK'D BY:
FINISH: POWDER PAINT BLACK DRL		APPR BY:
PROJECT: FERRISBURGH, VT N-G SGNL (42)		DATE: 06-14-16
SOLD TO: HIGHWAY TECH		DWG NO: A400607
SHIP TO:		PAGE: 1/3
P.O. NO: 10659		
REP: HIGHWAY TECH		



**\*\*CONFIDENTIAL\*\***

The information contained in this drawing is privileged and confidential, and may be protected from disclosure. Please be aware that any use or dissemination of this drawing may be subject to legal restriction or sanction.

REV	DATE	REVISION DESCRIPTION	BY

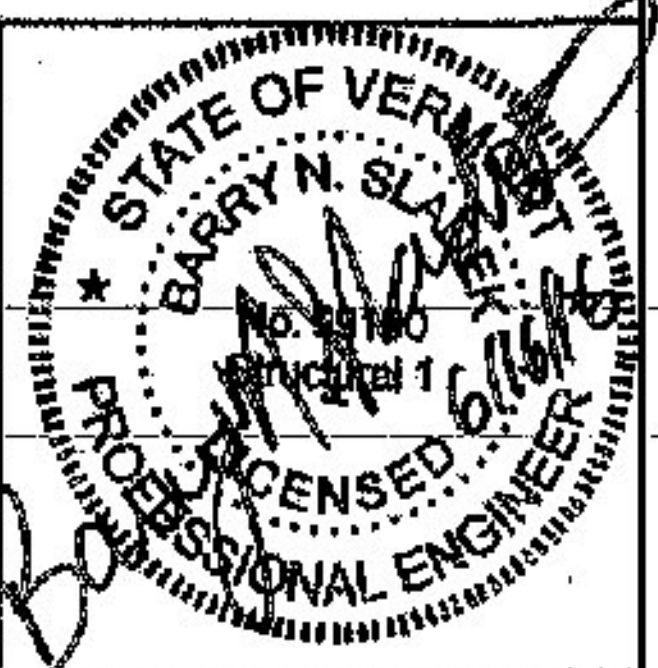


DO NOT SCALE

**valmont**  
 Valmont Industries, Inc. Structures Division  
 20636 Eaton Ave. Farmington, Minnesota 55024-7932  
 Phone: (651) 463-9990 (800) 399-7577  
 Fax: (651) 463-3349

TITLE: S TRUSS SGL A 12' x 32" x 3.5" 4.5 CL  
 MODEL NO.: 17A1232C45  
 MATERIAL: ALUMINUM ALLOY  
 FINISH: POWDER PAINT BLACK DBL  
 PROJECT: FERRISBURGH, VT NHG SGNL (42)  
 SOLD TO: HIGHWAY TECH  
 SHIP TO:  
 P.O. NO: 10859  
 REP: HIGHWAY TECH

QTY: 2  
 OWN BY: PVB  
 CORR BY:  
 APPR BY:  
 DATE: 06-14-16  
 DWG NO: A400607  
 PAGE:



**\*\*CONFIDENTIAL\*\***  
 The information contained in this drawing is privileged and confidential, and may be protected from disclosure. Please be aware that any use or dissemination of this drawing may be subject to legal restriction or sanction.

REV	DATE	REVISION DESCRIPTION	BY

BY 2/3



**APPROVED**  
By Ian Degutis at 9:16 am, Aug 18, 2016

See comments below

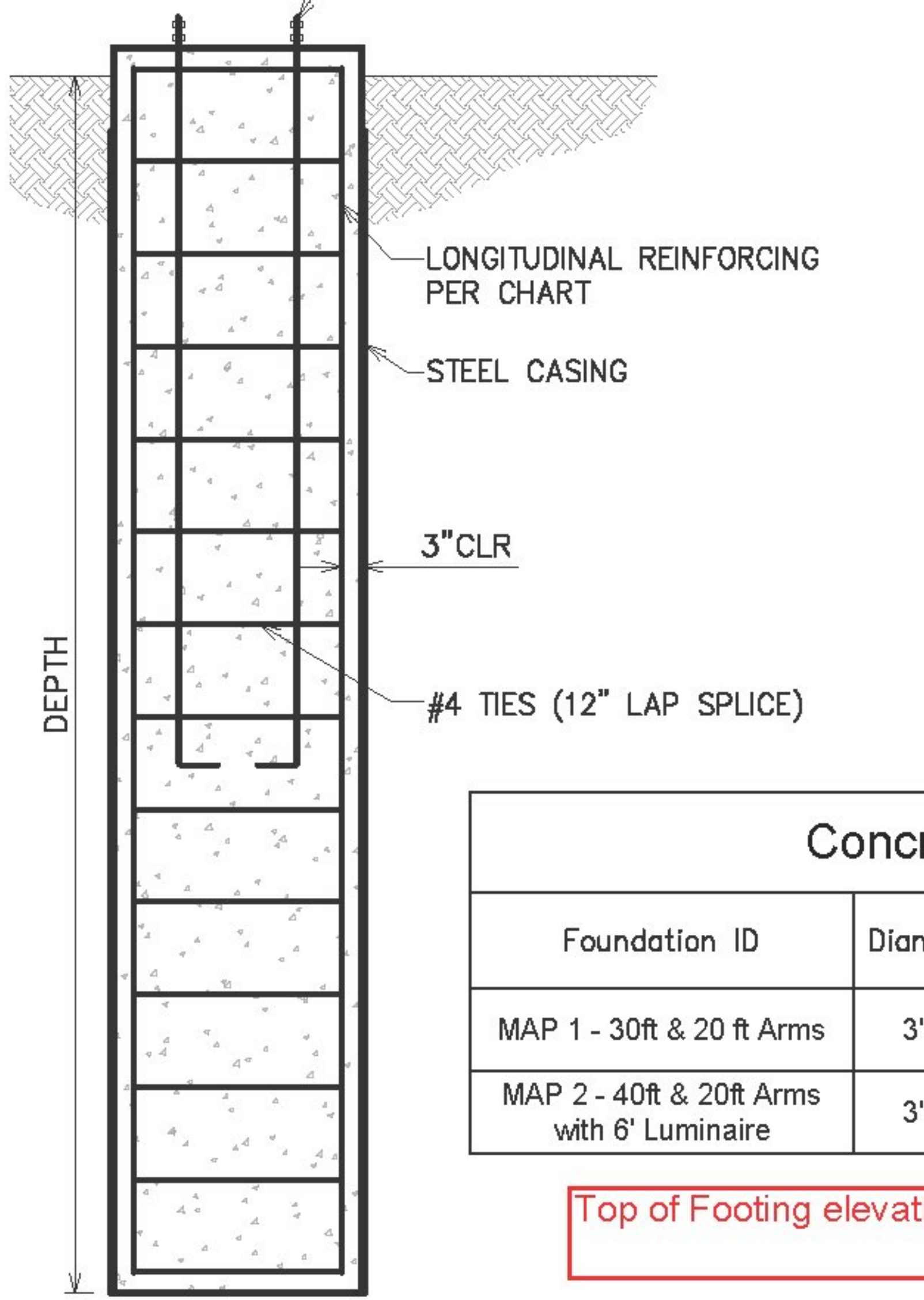
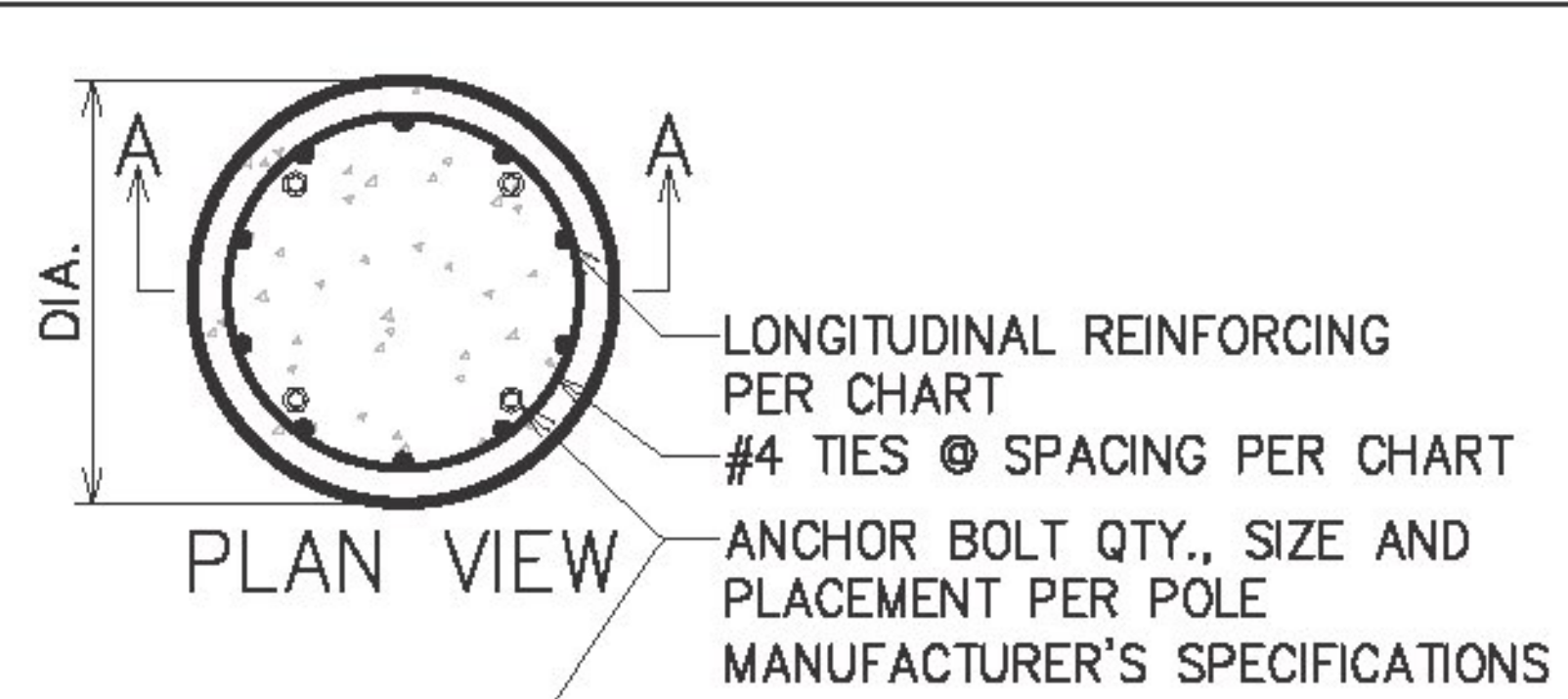
**US Route 7  
and  
Little Chicago/Middlebrook Roads  
Ferrisburgh, Vermont**  
\*\*\*\*\*  
*Design of Traffic Signal Foundations*

*Prepared  
August 2016*



By  
**CROSS CONSULTING ENGINEERS, P.C.**  
103 Fairfax Road  
St. Albans, Vermont 05478-6271  
Telephone: (802) 524-2113  
Facsimile: (802) 524-9681  
E-mail: [dwoolridge@crossconsultingengineers.com](mailto:dwoolridge@crossconsultingengineers.com)

*As Project Number 16067*



- Notes:
1. Foundation soil properties are based on unit weights and friction angles provided by VTrans – refer to design calculations for details.
  2. Min. concrete compressive strength: 3500 psi @ 28 days
  3. Reinforcing: ASTM A615 Grade 60
  4. Cast foundation against undisturbed earth or within a permanent steel casing.
  5. Install conduit per Owner specification.
  6. Extend foundation 4" above ground when in earth. Construct foundation flush when in concrete island or sidewalk.
  7. The design of the foundation follows VTrans MREI 10-01.
  8. Construct foundation in accordance with the current edition of the VTrans Standard Specifications for Construction.
  9. Refer to the plans prepared by VTrans (Project No. NHG SGNL(42)) for the location of underground utilities.
  10. Design Factors of Safety:
    - 10.1. Overturning: 3.0
    - 10.2. Bearing Capacity:
    - 10.3. Torsion: 1.1

We would prefer to see a definitive construction method specified here rather than an "or" condition. This is designed for the more conservative case and thus acceptable.

Concrete Foundation Data					
Foundation ID	Diameter	Depth	Long. Bars	Tie Spacing	Concrete Vol. (CY)
MAP 1 - 30ft & 20ft Arms	3'-6"	10'-6"	16-#6	1'-0"	4.8
MAP 2 - 40ft & 20ft Arms with 6' Luminaire	3'-6"	10'-6"	16-#6	1'-0"	4.8

Top of Footing elevation information should be provided here.

**SECTION A-A**

**Traffic Pole Foundation Design**  
**Intersection of US Route 7 and Little**  
**Chicago/Middlebrook Roads**

PROJECT: 16067  
 DATE: 2016-08-08  
 DRAWN: DSW

EX-1

**CCE CROSS**  
**CONSULTING ENGINEERS, P.C.**

Tel. 802-524-2113  
 Fax. 802-524-8681

103 Fairfax Rd.  
 St. Albans, Vermont 05478

© COPYRIGHT 2016  
 Cross Consulting Engineers, P.C.



**APPROVED**  
By Ian Degutis at 7:00 am, Jul 20, 2016

July 15, 2016

Highway Tech  
6 Sabattus Rd.  
Sabattus, ME 04280

Valmont Order: 326921-P1  
Customer Order: 10858

Enclosed is the revised drawing package for your approval. This drawing represents the Traffic Products to be furnished by Valmont Industries, Inc.

Please return one (1) complete set of drawings marked **Approved** to Shadava M. Schneider, or provide other written authorization at the time of order release.

Send to:

**VALMONT INDUSTRIES, INC.**  
Lighting, Traffic and Communication Structures  
28800 Ida St.  
P.O. Box 358  
Valley, Nebraska 68064-8016

**Valmont approval policy:** *It is important that all verification information must accompany the order release. Omission of the information may cause a delay in the shipping schedule. Also note; should we require additional information, clarification, or if there is a customer initiated change, the quoted lead-time is subject to when we receive this information. Our quoted lead-time begins once we receive the completed information or the final customer change. Damages resulting from delays in receiving complete information or customer changes will not be the responsibility of Valmont Industries, Inc.*

Sincerely,  
James T. Friesel  
jfriesel@valmont.com

cc: file

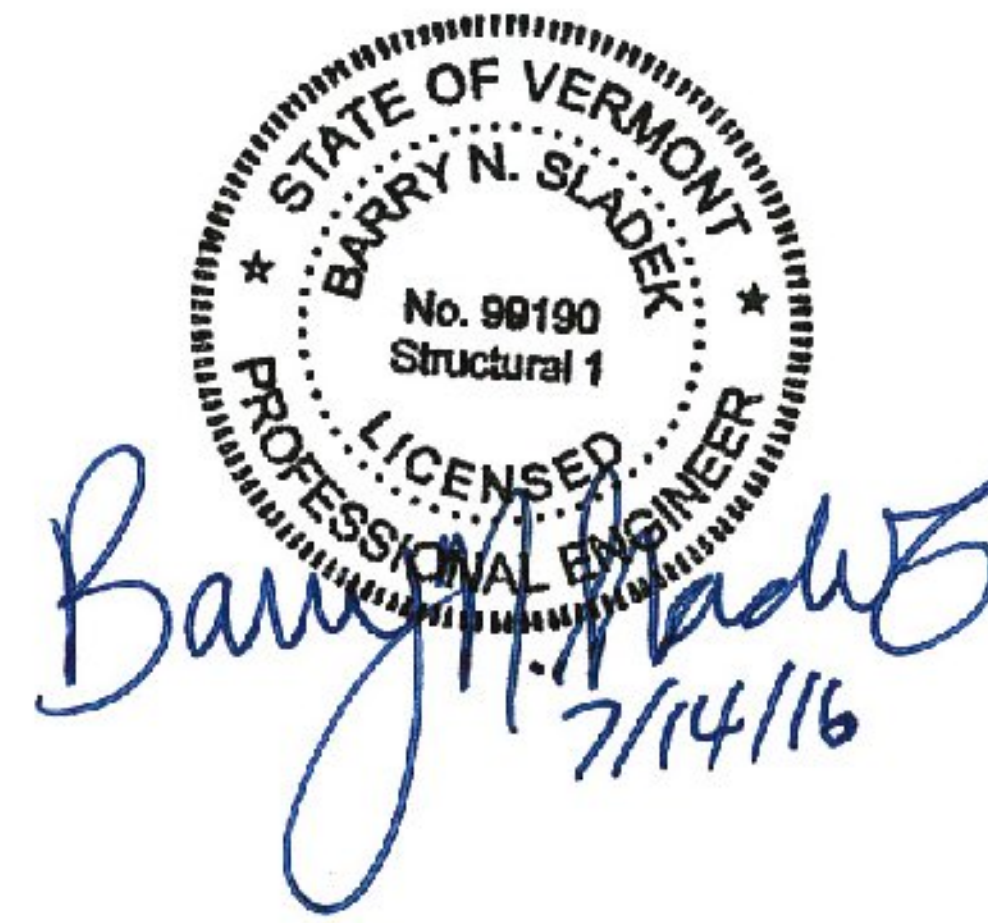


EAST COAST SIGNALS APPROVED FOR SUBMITTAL 7-18-16 MSF

Valmont Industries, Inc.  
West Highway 275  
P.O. Box 358  
Valley, Nebraska 68064-0358 USA  
(402) 359-2201

A Light & Traffic Structure Proposal  
for  
VERMONT D.O.T.  
NHG SGNL (42)  
RT 7 & LITTLE CHICAGO/MIDDLEBROOK RD

Valmont Order No.: 326921

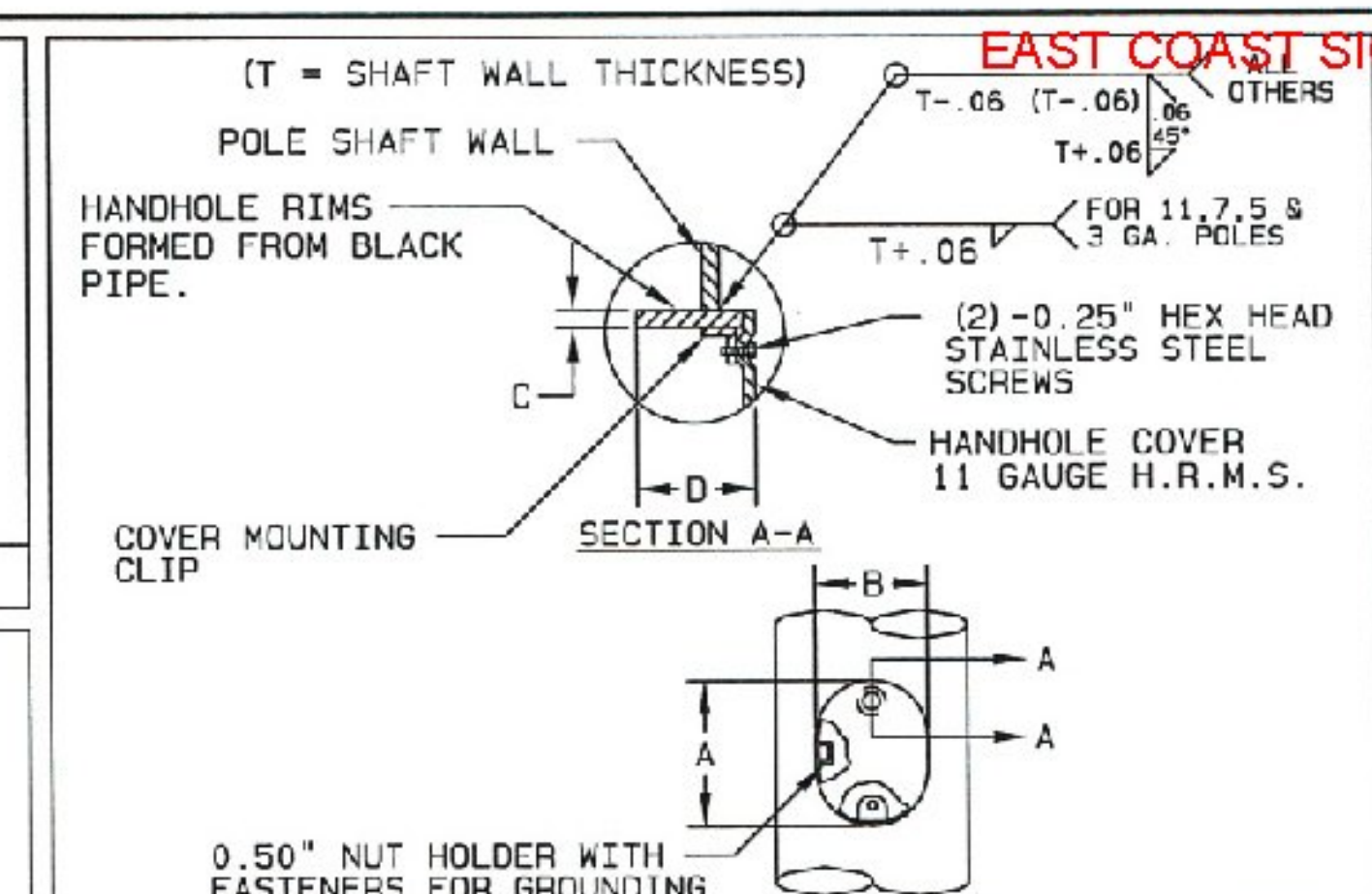
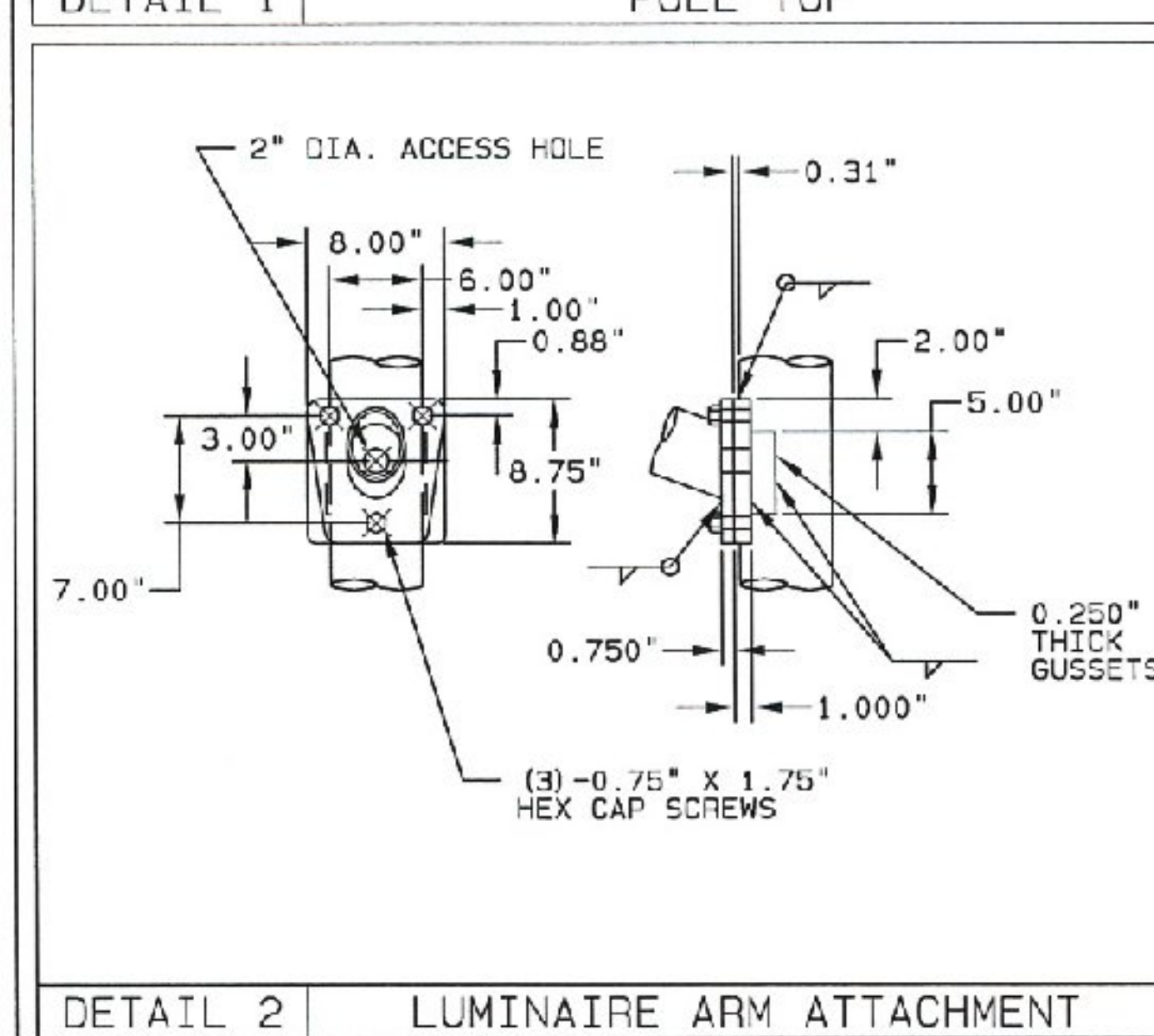
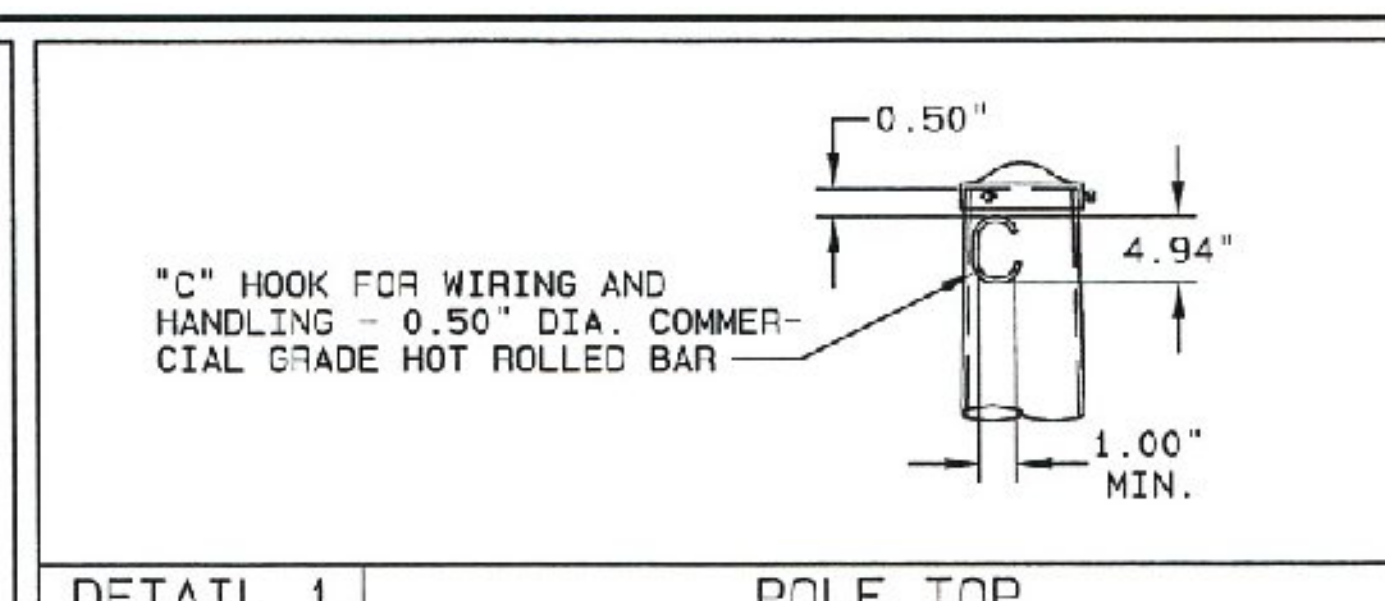
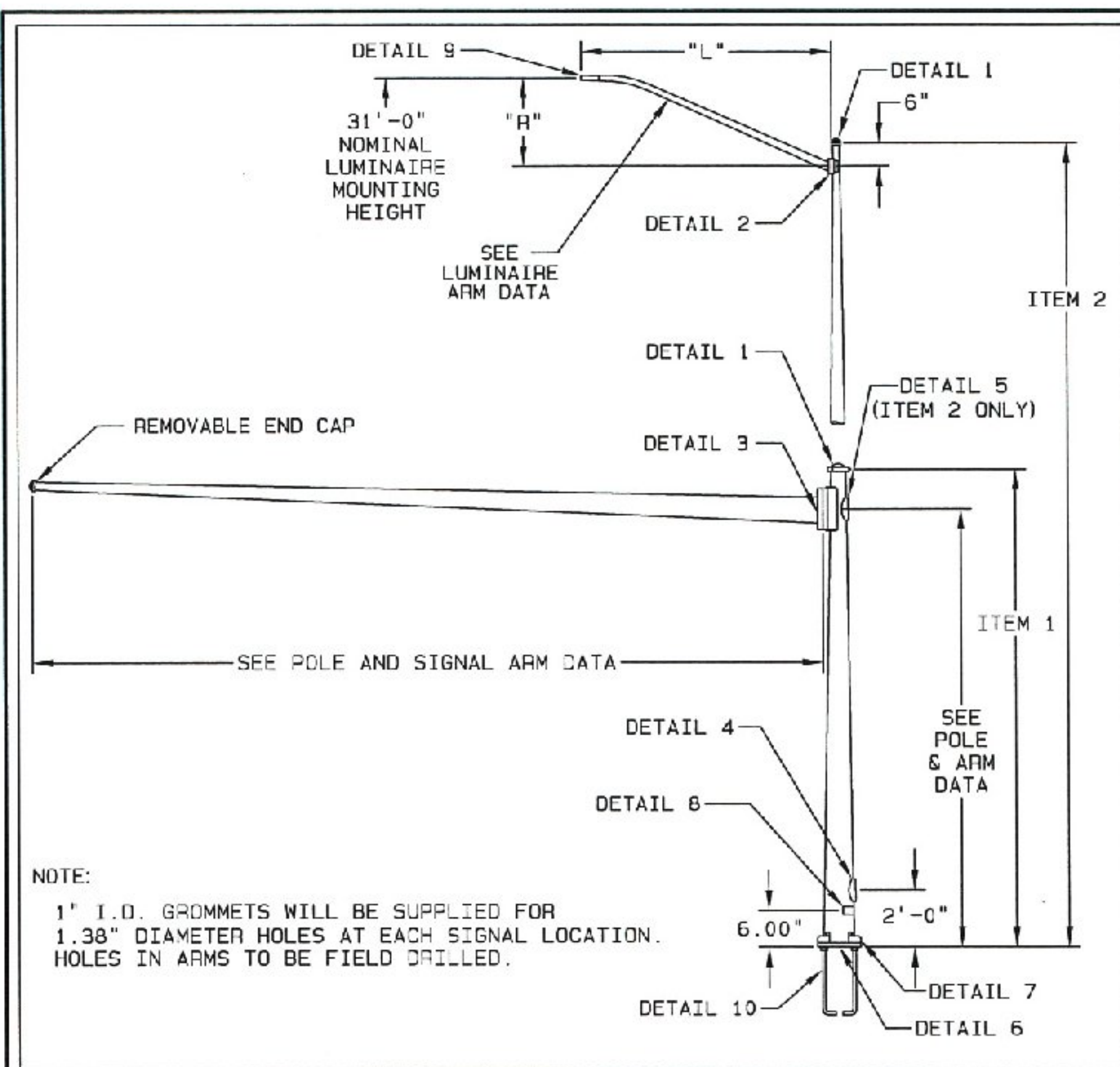


Prepared By:  
Barry N. Sladek, P.E.  
Senior Professional Engineer  
July 11, 2016

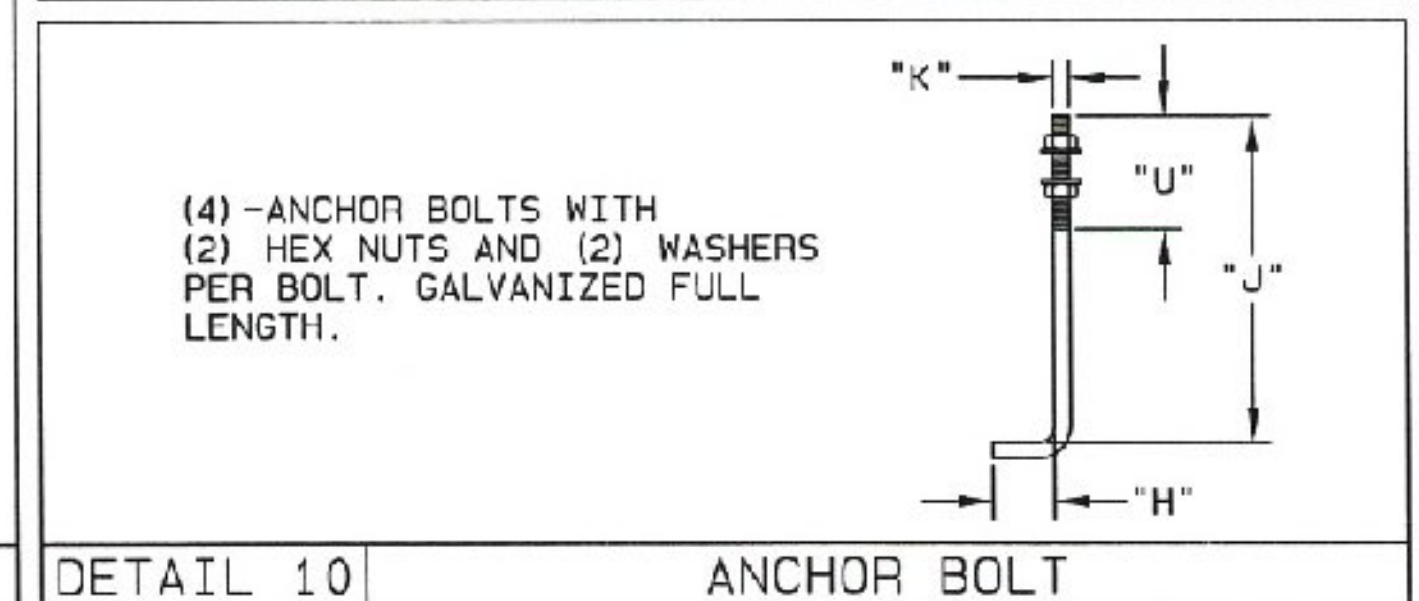
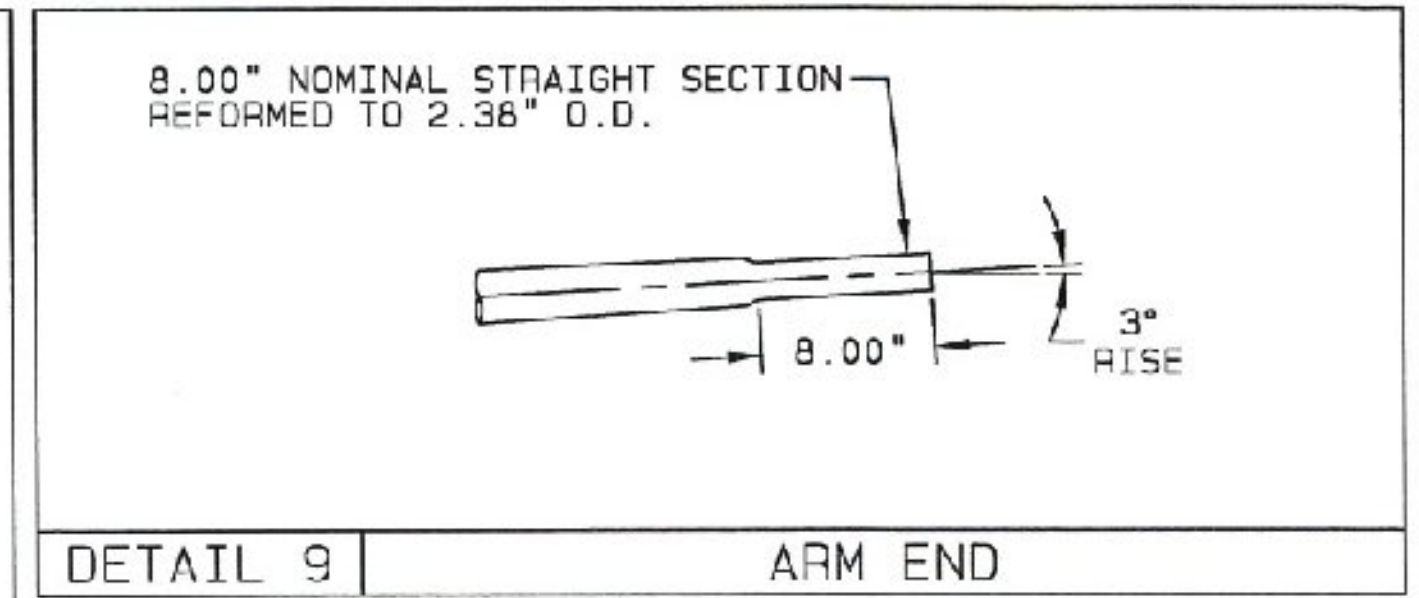
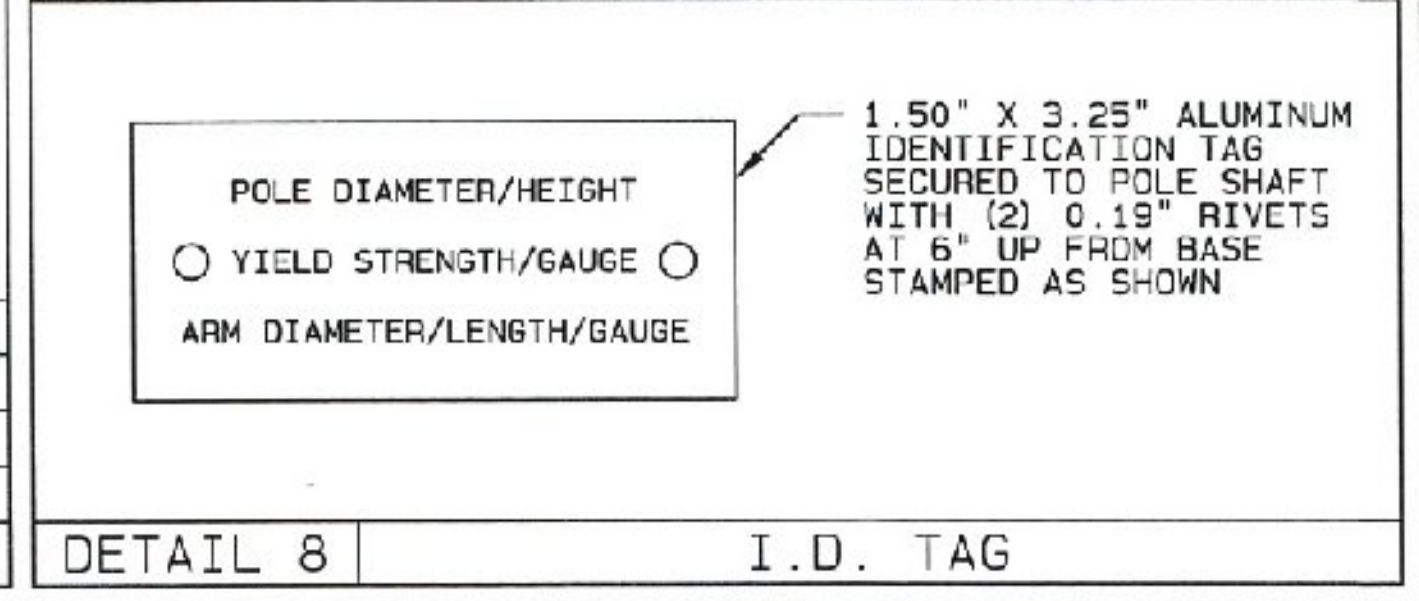
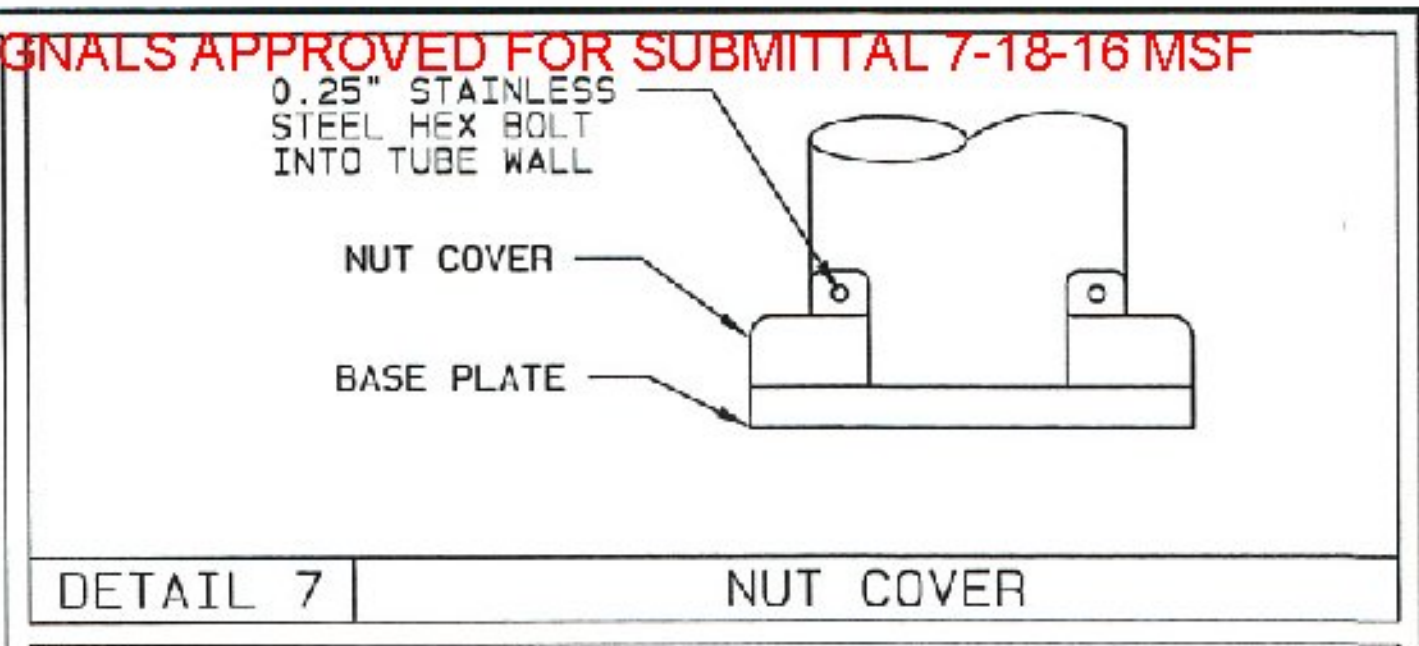
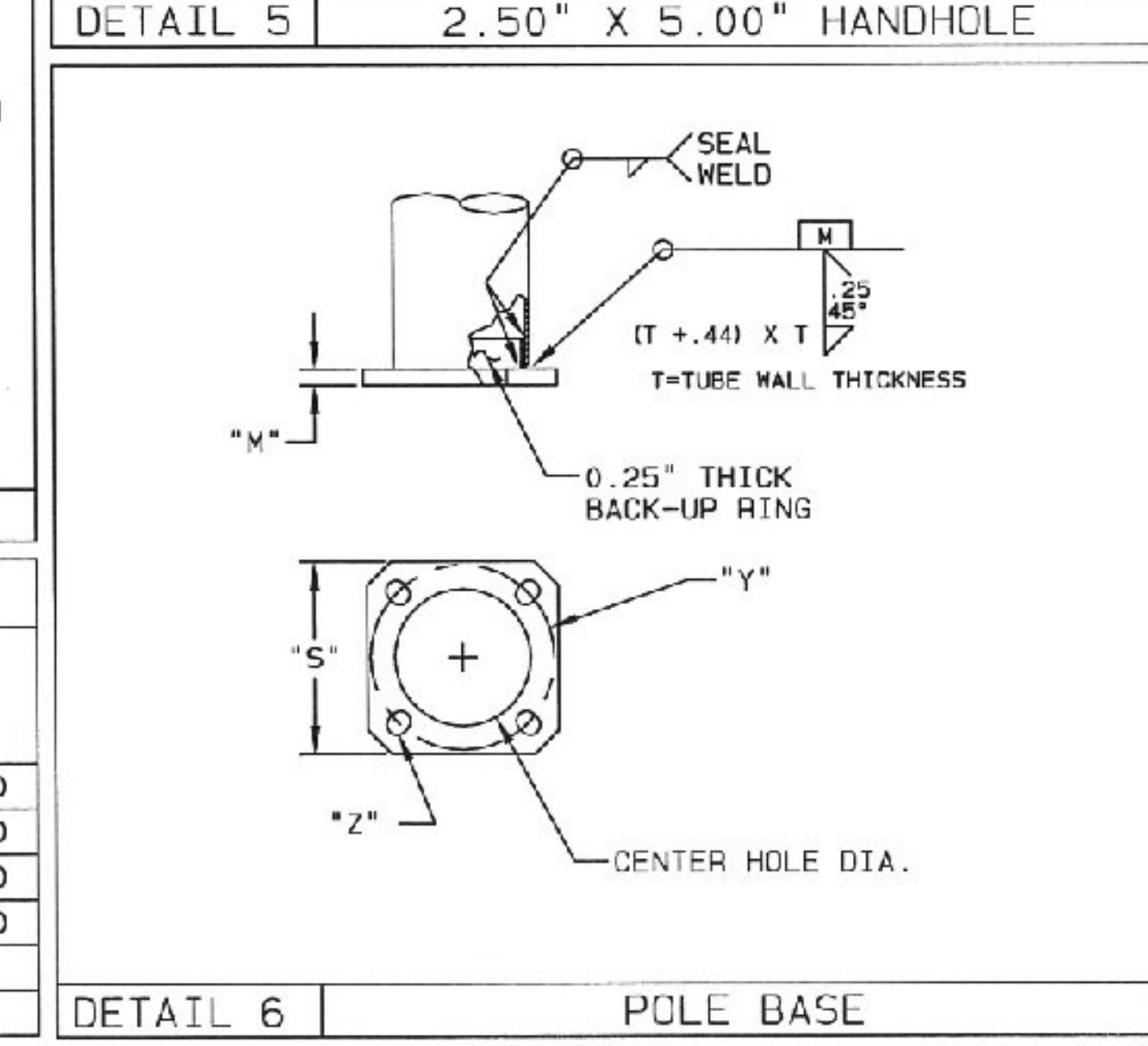
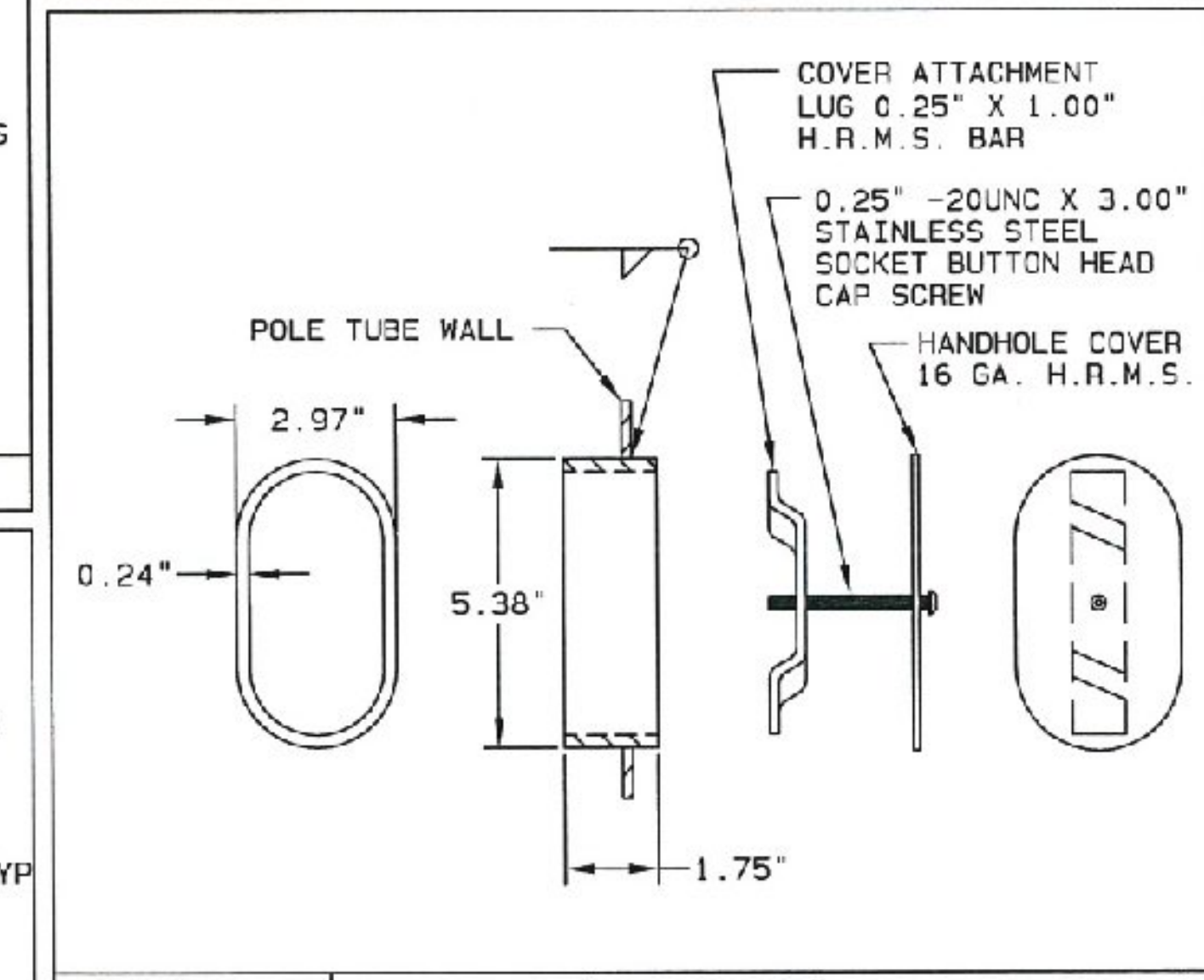
Revision A

Proprietary Information

These documents, drawings and/or calculations and all information related to them are the exclusive property and the proprietary information of Valmont Industries, Inc. and are furnished solely upon the conditions that they will be retained in strictest confidence and shall not be duplicated, used or disclosed in whole or in part for any purpose, in any way, without the prior written permission of Valmont Industries, Inc.



ITEM NUMBER	A	B	C	D
#1	7.31"	5.63"	0.430"	3.000"
#2	7.56"	5.50"	0.500"	3.000"



MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
TAPERED TUBES	A595 GR. A OR A572	55	ANCHOR BOLTS	F1554 GR. 55	55
POLE BASE	A36	36	GALVANIZING- STRUCTURE	A123	
LUMINAIRE ARM PIPE	A36	36	GALVANIZING- HARDWARE	A153	
SIGNAL ARM CONNECTION	A36	36			
SIGNAL ARM CONN. BOLTS	A325				

LUMINAIRE ARM DATA

ARM SPAN "L" (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GA.	RISE HEIGHT "R" (FT)
12.00	4.15	2.40	11	2.50

SYSTEM: FINISH PAINT/GALVANIZED (FPGV)  
 BASE COAT: HOT-DIP GALVANIZED TO ASTM A123  
 PRIME COAT: NONE  
 FINISH COAT: TGIC OR URETHANE POLYESTER POWDER  
 COLOR: BLACK  
 SPEC: F-283A

SIGNAL ARM ATTACHMENT DATA

ITEM # / ARM LENGTH	"A" (IN)	"B" (IN)	"C" (IN)	CENTER HOLE DIA. (IN)	"D" (IN)	"E" (IN X IN)
#1 / 30'	17.75	14.50	2.00	8.50	0.375	1.25 X 6.00
#1 / 20'	17.75	14.50	2.00	7.00	0.375	1.25 X 6.00
#2 / 40'	17.75	14.50	2.00	9.75	0.375	1.25 X 6.00
#2 / 20'	17.75	14.50	2.00	7.00	0.375	1.25 X 6.00

REV	DRWN BY-DATE	CHECK BY-DATE	DESCRIPTION
A	JTF 07/13/16	JTF 07/13/16	WAS TRUSS STYLE LUM. ARM
	JTF 06/20/16	JTF 06/20/16	

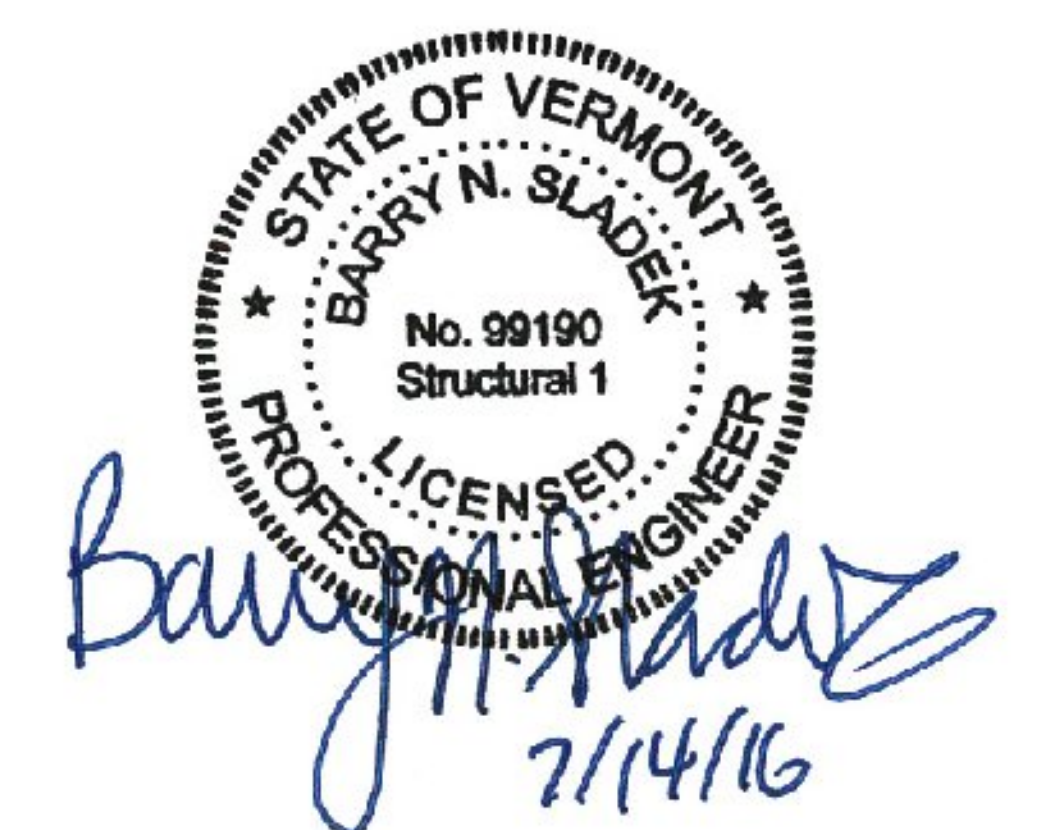
SOLD TO: HIGHWAY TECH  
 SHIP TO: EAST COAST SIGNALS, INC.  
 P.O. #: 10856  
 AGENT: HIGHWAY TECH

JOB: VT - NHC SONL (42) - INTERSECTION OF RT 7 & LITTLE CHICAGO/MIDDLEBROOK RD  
 TITLE: TRAFFIC SIGNAL STRUCTURES

VALMONT INDUSTRIES, INC. RESERVES THE RIGHT TO INSTALL VARIOUS, ENGINEER APPROVED, MATERIAL HANGING ACCOMMODATIONS TO FACILITATE THE MANUFACTURING PROCESS.



ORDER NUMBER: 326921-P1  
 PAGE NUMBER: 1 OF 2  
 DRAWING NUMBER: VT326921P1  
 REV: A



### POLE AND SIGNAL ARM DATA

ITEM	QTY.	POLE TUBE				POLE BASE					ANCHOR BOLT				SIGNAL ARM TUBE					LUMINAIRE ARM SPAN "L" (FT)
		BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	CENTER HOLE DIA. (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	MAST ARM ATTACHMENT HEIGHT (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	SPAN (FT)	
1	1	13.00	9.92	22.00	5	18.00	11.50	17.00	2.00	1.75	1.50	54.00	6.00	8.00	20.00	10.00	5.80	7	30.00	N.A.
															20.00	9.00	6.20	7	20.00	
2	1	13.00	8.94	29.00	3	19.00	11.25	18.00	2.00	2.00	1.75	84.00	6.00	8.00	20.00	11.50	5.90	7	40.00	12.00
															20.00	9.00	6.20	7	20.00	

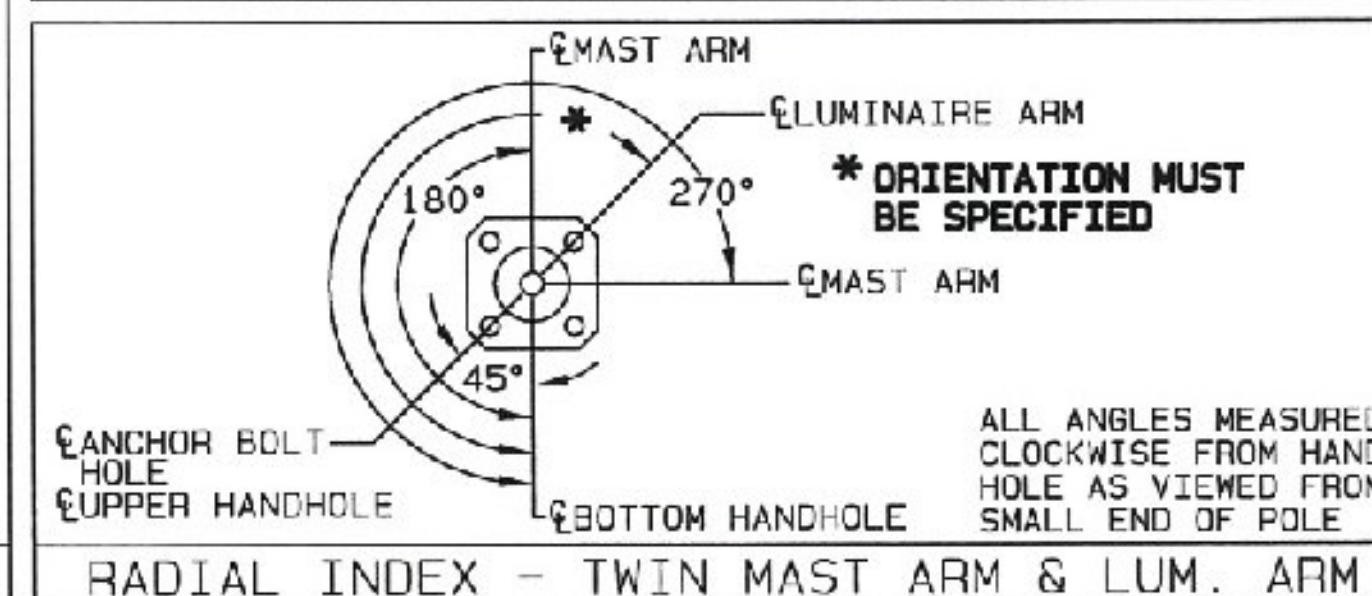
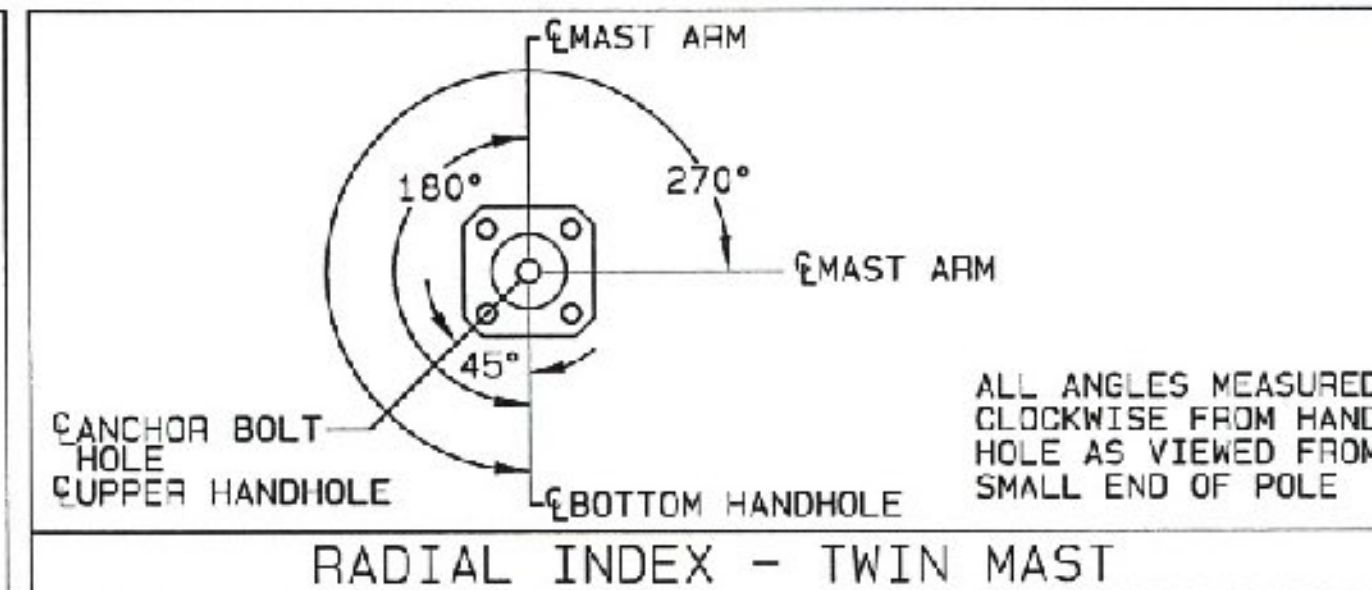
THE MAST ARM TRAFFIC STRUCTURES SHOWN ON THIS DRAWING HAVE BEEN DESIGNED IN ACCORDANCE WITH THE LOADING AND THE ALLOWABLE STRESS REQUIREMENTS OF THE 2013 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", SIXTH EDITION, LTS-6. THE WIND LOADS WERE CALCULATED FROM A BASIC WIND VELOCITY OF 90 MPH WITH A RECURRENCE INTERVAL OF 50 YEARS, AND A FATIGUE CATEGORY OF 2. THE FATIGUE LOADS WERE CALCULATED ON THE REQUIREMENTS OF SECTION 11 OF THE CODE, AND THE FOLLOWING DESIGN CONDITIONS:

- STRUCTURES ARE DESIGNED TO RESIST NATURAL WIND GUSTS BASED ON THE YEARLY MEAN WIND VELOCITY OF 11.2 MPH.
- STRUCTURES ARE NOT DESIGNED TO RESIST GALLOPING-INDUCED CYCLIC LOADS.
- STRUCTURES ARE DESIGNED FOR TRUCK-INDUCED GUST LOADS, AS REQUIRED BY THE OWNER OF THE STRUCTURES.

**AASHTO 2013 SPECIFICATIONS**

ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. THE VALMONT WARRANTY SPECIFICALLY EXCLUDES FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT.

**VIBRATION NOTE**



**HORIZONTAL MAST ARM TO VERTICAL POLE SUPPORT CONNECTION BOLTS:**

VALMONT INDUSTRIES, INC. RECOMMENDS THAT THE CANTILEVER MAST ARM TO VERTICAL POLE SUPPORT CONNECTION BOLTS AND NUTS BE INSTALLED AND TIGHTENED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", UTILIZING THE "TURN-OF-NUT PRETENSIONING" REQUIREMENTS.

**VERTICAL POLE SUPPORT ANCHOR BOLT NUTS:**

VALMONT INDUSTRIES, INC. RECOMMENDS THAT THE VERTICAL POLE SUPPORT ANCHOR BOLT NUTS BE INSTALLED AND TIGHTENED IN ACCORDANCE WITH THE SIXTH EDITION (2013) OF THE AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", SECTION C5.17.5.2.

**\*NOTE:**  
LUMINAIRE ARM ORIENTATION MUST BE PROVIDED AT TIME OF RELEASE FOR MANUFACTURE. FAILURE TO DO SO WILL RESULT IN THE ORDER BEING PLACED ON HOLD.



JCB VT - NHG SGNL (42) - INTERSECTION OF RT 7 & LITTLE CHICAGO/MIDDLEBROOK RD  
TITLE TRAFFIC SIGNAL STRUCTURES

VALMONT INDUSTRIES, INC. RESERVES THE RIGHT TO INSTALL VARIOUS, ENGINEER APPROVED, MATERIAL HANGING ACCOMMODATIONS TO FACILITATE THE MANUFACTURING PROCESS.



ORDER NUMBER: 326921-P1  
PAGE NUMBER: 2 OF 2  
DRAWING NUMBER: VT326921P1  
REV: A

**APPROVED**

By Ian Degutis at 7:30 am, Jun 27, 2016

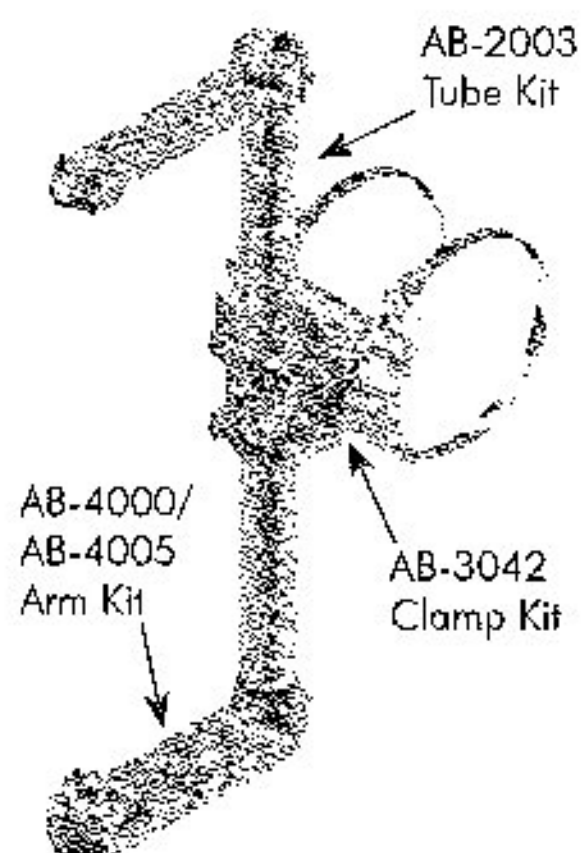
EAST COAST SIGNALS APPROVED FOR SUBMITTAL 6-24-16 MSF

1-Way Assemblies

Designed to accommodate all traffic signals, with the exception of optically programmed. The Tallon Series Astro-Brac is designed to be tough and durable. It features all-axis adjustability and is designed to facilitate the mounting of any size signal to any size mast arm or pole.



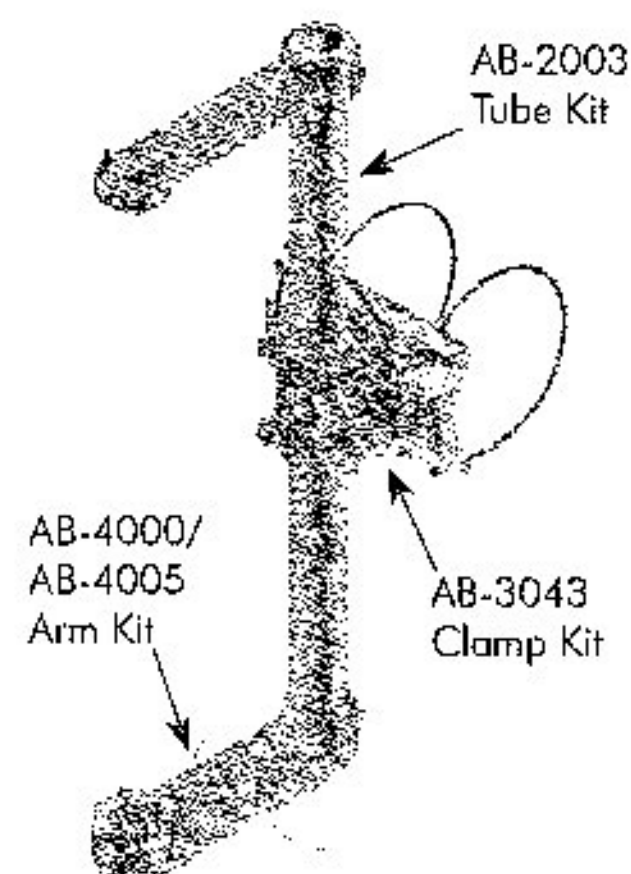
Astro-Brac  
PELCO PRODUCTS



**Astro-Brac Assy, Tallon Series, 1-Way Band Mount**

Signal Section	Band Length	Coating
AB-0618 - [ ] - [ ] - [ ]		
1=1 Sec	29=29" Band	PNC=Process No Color
2=2 Sec	36=36" Band	P_ =Paint
3=3 Sec	42=42" Band	
4=4 Sec	48=48" Band	
5=5 Sec	56=56" Band	

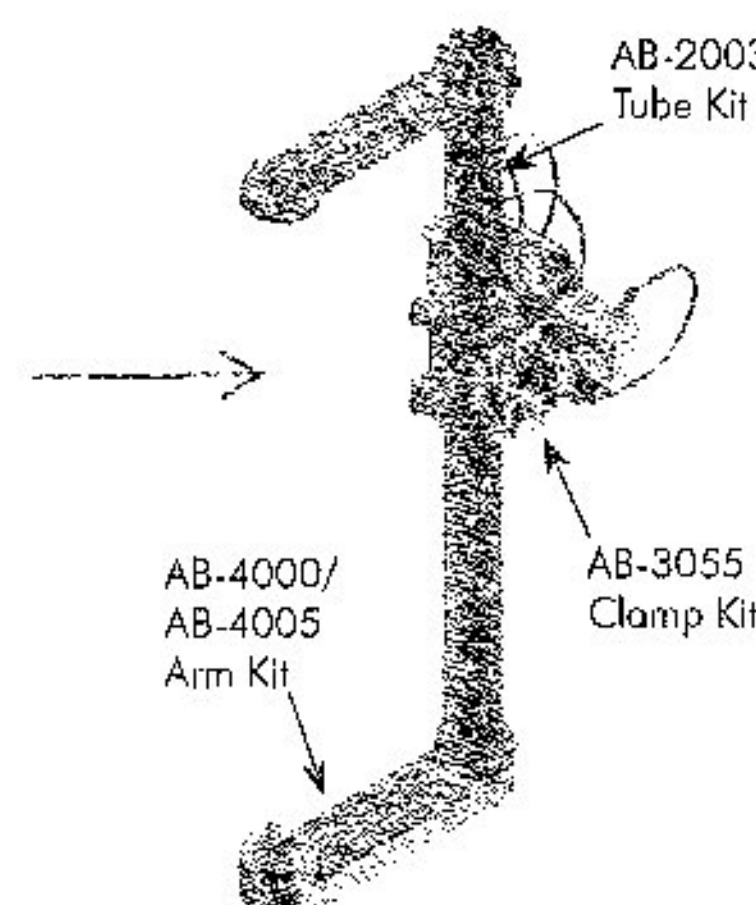
Note:  
Stainless steel upgrade available; includes stainless clamp screw and slotted washer.  
Specify by including -SS in the part number; i.e., AB-0618-3-29-SS-PNC.



**Astro-Brac Assy, Tallon Series, 1-Way Cable Mount**

Signal Section	Cable Length	Coating
AB-0617 - [ ] - [ ] - [ ]		
1=1 Sec	62=62" Cable	PNC=Process No Color
2=2 Sec	84=84" Cable	P_ =Point
3=3 Sec	96=96" Cable	
4=4 Sec		
5=5 Sec		

Note:  
Stainless steel upgrade available; includes stainless cable and slotted washer.  
Specify by including -SS in the part number; i.e., AB-0617-3-62-SS-PNC.



**Astro-Brac Assy, Galaxy Series, 1-Way Cable Mount**

Signal Section	Cable Length	Coating
AG-0125 - [3, 4] - [84] - [P-34] Black		
1=1 Sec	62=62" Cable	PNC=Process No Color
2=2 Sec	84=84" Cable	P_ =Point
3=3 Sec	96=96" Cable	
4=4 Sec		
5=5 Sec		

Note:  
Stainless steel upgrade available; includes stainless cable and slotted washer.  
Specify by including -SS in the part number; i.e., AG-0125-3-62-SS-PNC.

- Note: 1. All assemblies are supplied standard with stainless steel fasteners.
- 2. See Reference Section for clamp kit pole diameters.
- 3. See Reference Section for available paint colors.



**APPROVED**  
By Ian Degutis at 7:39 am, Jun 27, 2016

EAST COAST SIGNALS APPROVED FOR SUBMITTAL 6-24-16 MSF

## Traffic Signal Housing

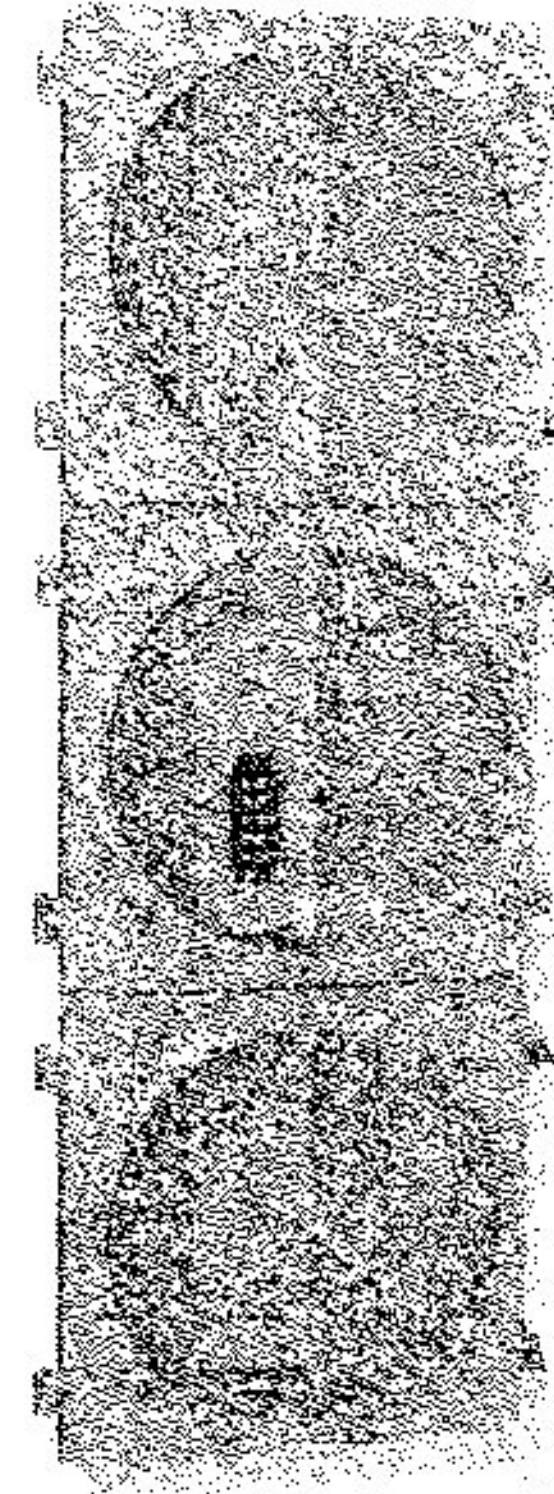
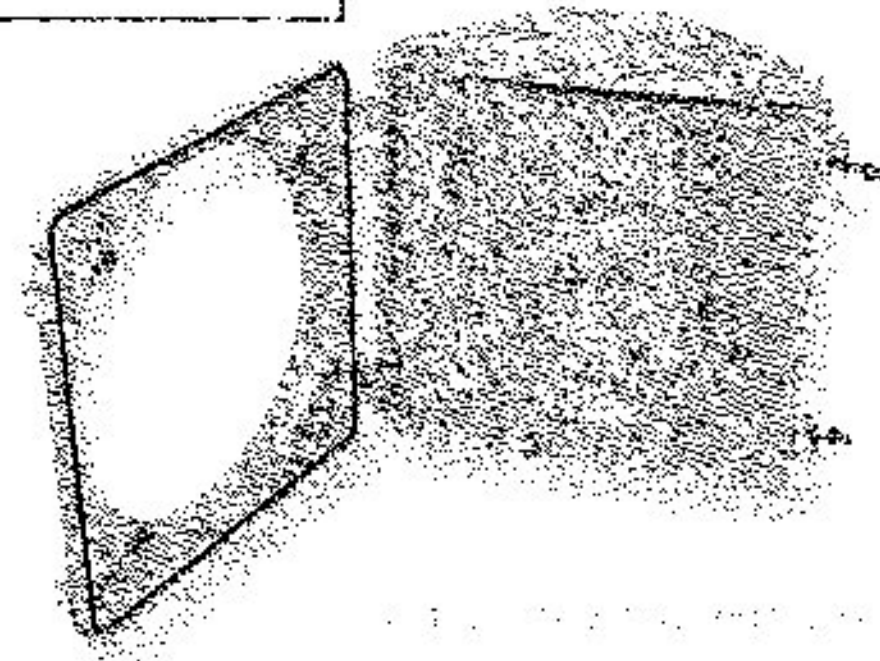


8" Diameter

12" Diameter

Aluminum

Polycarbonate



Cabinets  
Controllers  
**Signals**  
Signs  
Software  
Specialty

McCain's Traffic Signal Housings, available in eight and twelve inch varieties, provide a durable and low-maintenance housing for standard LED modules as well as McCain incandescent optical assemblies. Manufactured from polycarbonate or aluminum, the housings are compliant with multiple agency standards including the Institute of Transportation Engineers (ITE), Caltrans, and most state Departments of Transportation (DOTs). An industry leader in signal manufacturing and supply, McCain offers an extensive range of materials, configurations, and accessories, including backplates, visors, and signal assemblies, to meet your traffic signal requirements.

### Benefits

- Modular design promotes flexible configuration options: one to five sections, vertical, horizontal, and doghouse (5-section cluster)
- Fabricated from aluminum or polycarbonate with 10% fiberglass reinforcement (available without fiberglass reinforcement)
- 8" or 12" diameter
- Weathertight doors
- Custom hardware and terminal block location available

### Product Description

The McCain Traffic Signal Housings are modular in design, allowing a multitude of signal housing configurations for standard LEDs as well as McCain incandescent optical assemblies.

Available in polycarbonate and aluminum, each section is injection molded or cast in one piece. Reinforcement ribs and serrated ports, both top and bottom, provide strength and positive locking with other sections and mounting hardware. Positive latching of doors is achieved with stainless steel eyebolts and wing nut assemblies, and the doors feature four metal threaded inserts for visor attachment. A positive seal is assured with an E.P.D.M. rubber gasket creating a moisture-free and dust-tight atmosphere.

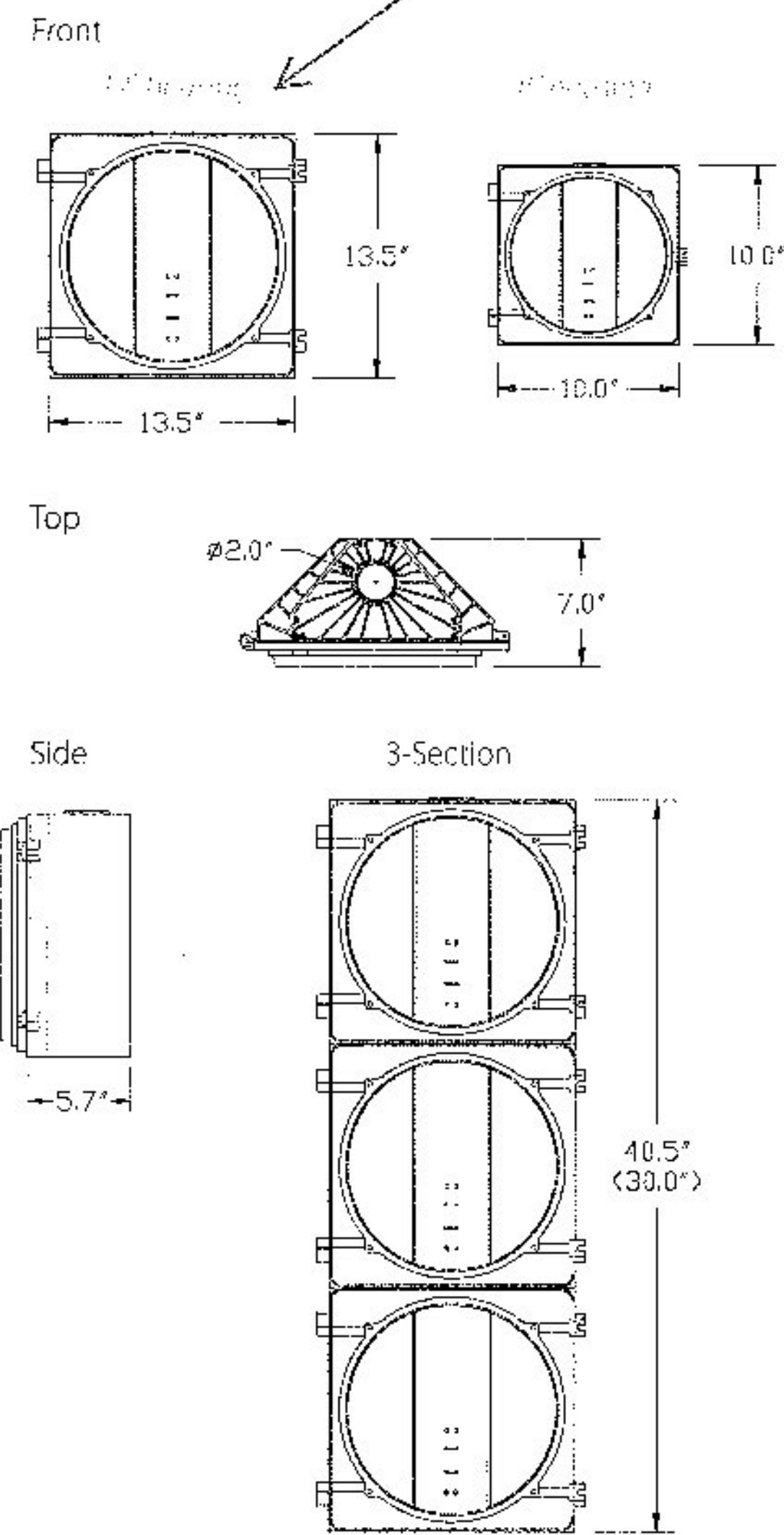
Traffic Signal Housings are compatible with McCain backplates and visors, available in both aluminum and ABS. The top and bottom ports allow installation into many framework mounting assemblies.

Signals supplied will be black, 3 & 4-Section with Tunnel visors

**McCain**  
www.mccain-inc.com

**EAST COAST SIGNALS APPROVED FOR SUBMITTAL 6-24-16 MSF**

**Traffic Signal Housing**



Dimensions are approximate and may vary  
 3-section 12" housing shown as an example  
 configurations. 8" section 8" housing light  
 dimensions listed in parentheses.  
 1" depth for the 8" and 12" housings are  
 approximately the same.  
 Minor differences between the 8" and 12" may  
 not be shown.

**Standard Features**

- Modular sections, one-piece, injection molded or cast
- 72 tooth serrated boss and reinforcing ribs, top and bottom
- Brass threaded inserts for visor attachment (4)
- Housings have a cast boss for mounting a 5 or 6-position terminal block; one side of terminal block with fast-on terminals, the other side with screw terminals
- The words red, amber, and green are cast next to each boss to identify light source lead wires
- 5 or 6-position terminal block installed in center section (1) (alternate mounting is available)
- Stainless steel door roll pins and eye bolt/wing nut assemblies
- Integral lugs on the housing and doors with stainless steel roll pins provide effective door hinges
- Weathertight E.P.D.M. rubber door gasket
- Aluminum and polycarbonate, and 8" and 12" housings can be mixed in one signal head

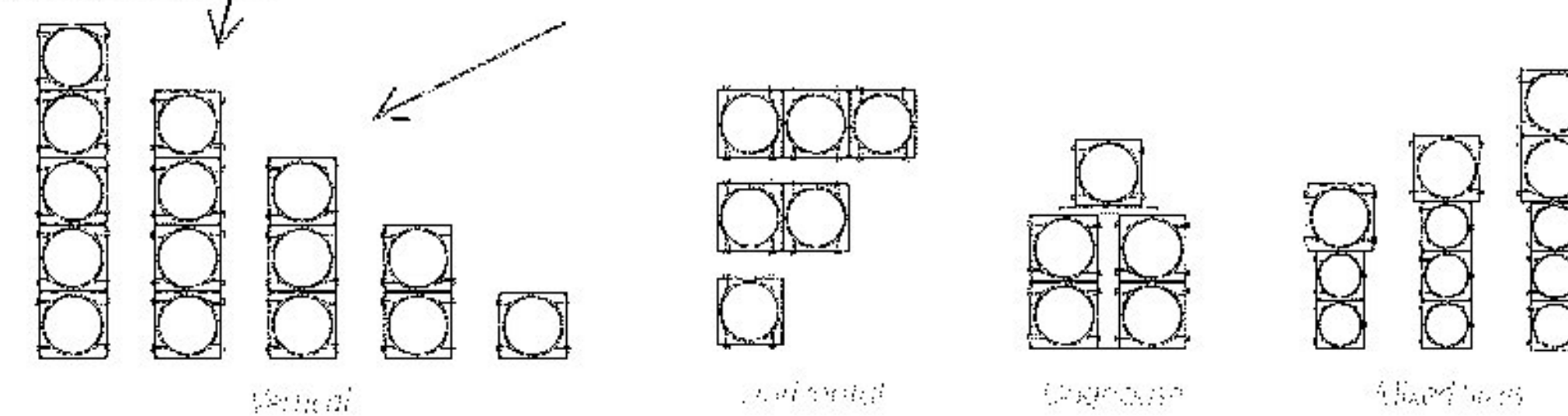
**General Specifications**

Dimensions:	8": 10.0" H x 10.0" W x 7.0" D
(1-section)	12": 13.5" H x 13.5" W x 7.0" D
Material:	Polycarbonate: Ultraviolet and heat stabilized, flame retardant, permanently colored, 10% fiber-glass reinforcement Aluminum: Type 360, reduced corrosion, increased powder coat adhesion
Finish(es):	Polycarbonate: Colored resins integral to housing Aluminum: Powder coated
Color(s):	Federal yellow, signal green, black, or custom colors
Mounting:	2.0" hole top and bottom fits 1.5" NPT fittings
Environmental:	Operating temperature: -37°C to +74°C Humidity: 0 to 95% (non-condensing)
Shipping Weight:	Polycarbonate: 8" - 2.1 lbs    12" - 4.2 lbs Aluminum: 8" - 4.0 lbs    12" - 7.8 lbs

**Options**

- Fiberglass-free polycarbonate
- Location, quantity, and type of terminal blocks
- Door mounting hardware: Push pin (removable) or roll pin (permanent)
- Visors
- Backplates
- Mounting: Various framework, orientation, and configurations
- Light Source: LED or incandescent
- High-performance (highly directional) signal version

Typical configurations



To learn more about  
 McCain's Integrated Traffic  
 Solutions, please contact  
 1-800-368-3333 or  
 call (207) 375-8248



2365 OAK RIDGE WAY VISTA, CALIFORNIA 92081 USA WWW.MCCAIN-INC.COM

© 2014 McCain, Inc. All rights reserved. McCain, Inc. is a registered trademark of McCain, Inc. in the United States and other countries. McCain, Inc. is not responsible for the content of any external links.

# Backplates with Retroreflective Borders

**APPROVED**  
By Ian Degutis at 7:39 am, Jun 27, 2016



Shown is a 3-Section  
Louvered Version

## Overview

McCain's Backplates for traffic signals provide a visual contrast between signal heads and the background enhancing signal visibility that is further improved with the use of retroreflective tape around the border of the backplate. The use of retroreflective tape has received approval from the Federal Highway Administration (FHWA), *MUTCD Interim Approval for Use of Retroreflective Border on Signal Backplates*, February 6, 2004. A seven-year safety study showed that the use of retroreflective backplate borders reduced total crashes at intersections by 15% to 24%. Backplates with retroreflective borders provide an aesthetically pleasing and functional look in addition to increased traffic safety for your intersections.

## Benefits and Features

- Enhanced signal visibility
- 1", 2", or 3" Retroreflective tape border
- Available in 1-section thru 5-section in-line, and 5-section cluster configurations
- Fits 8" and 12" signals
- 5" overall width
- Louvered and non-louvered
- Standard flat black powder coat face
- Compatible with most standard signal mountings

## Product Description

McCain's Backplates with retroreflective borders for standard traffic signals fit both 8" and 12" signal heads, are fabricated from louvered aluminum, and have five-inch borders. They accommodate retroreflective tape widths of one inch, two inches, or three inches around the perimeter of the backplates.

The backplate aluminum is 0.050" thick and is powder coated flat black for increased visual contrast against the background.

McCain backplates are configured for one-section to five-section in-line or five-section cluster signals. All the in-line backplates are fabricated from one solid piece of aluminum. The five-section cluster backplate is a three-piece design.

The retroreflective tape is specially designed by 3M for vertical mounting and comes in two options:

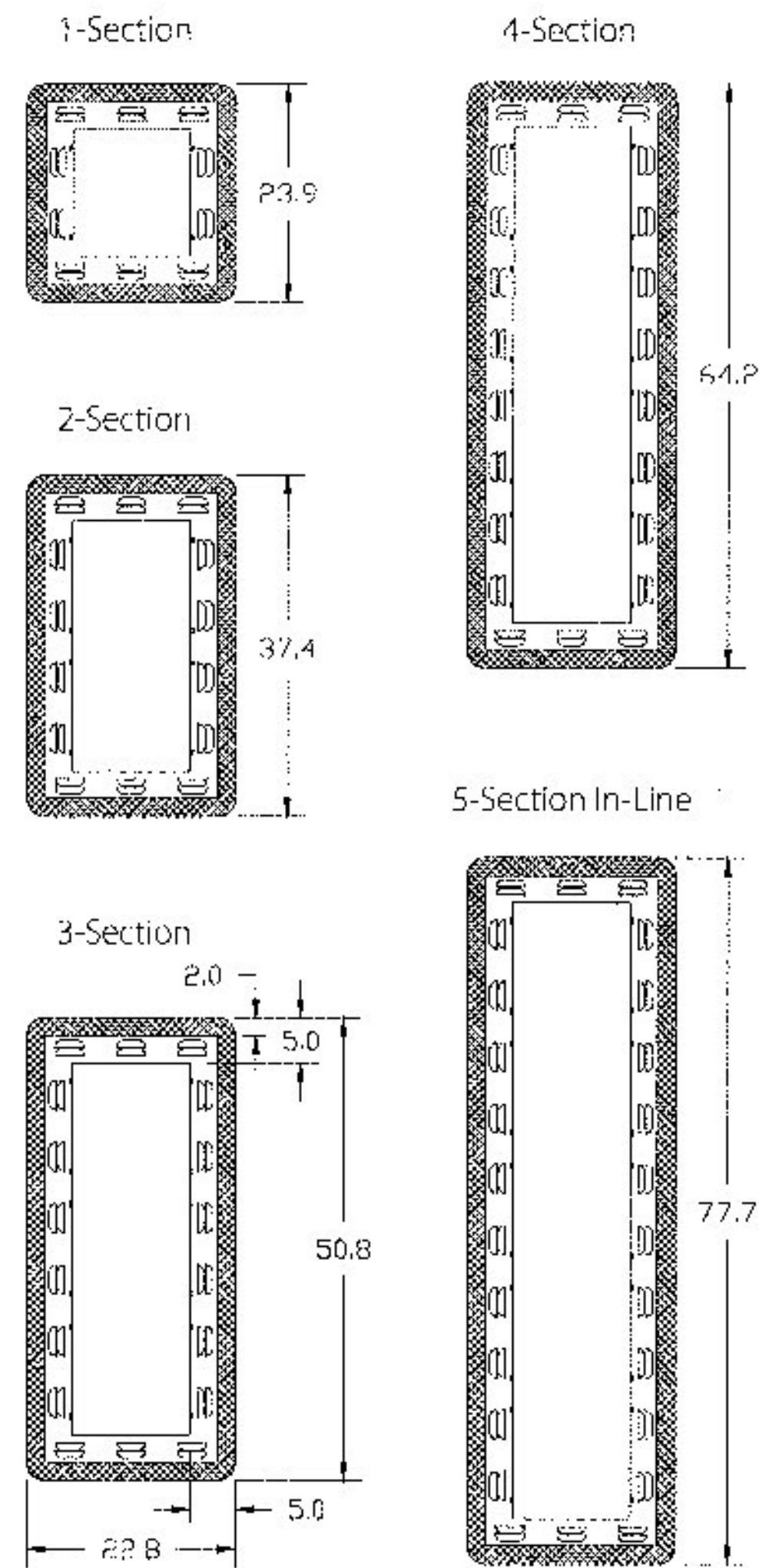
- 3M 3930 Series High Intensity Prismatic Reflective Sheeting
- 3M 3990 Series Diamond Grade VIP Reflective Sheeting

Backplates provided will be 3-Section & 4-Section. Reflective tape used will be 2" wide Reflective Fluorescent Yellow Tape, 3M# 4081

**McCain**  
www.mccain-inc.com

Backplates with Retroreflective Borders

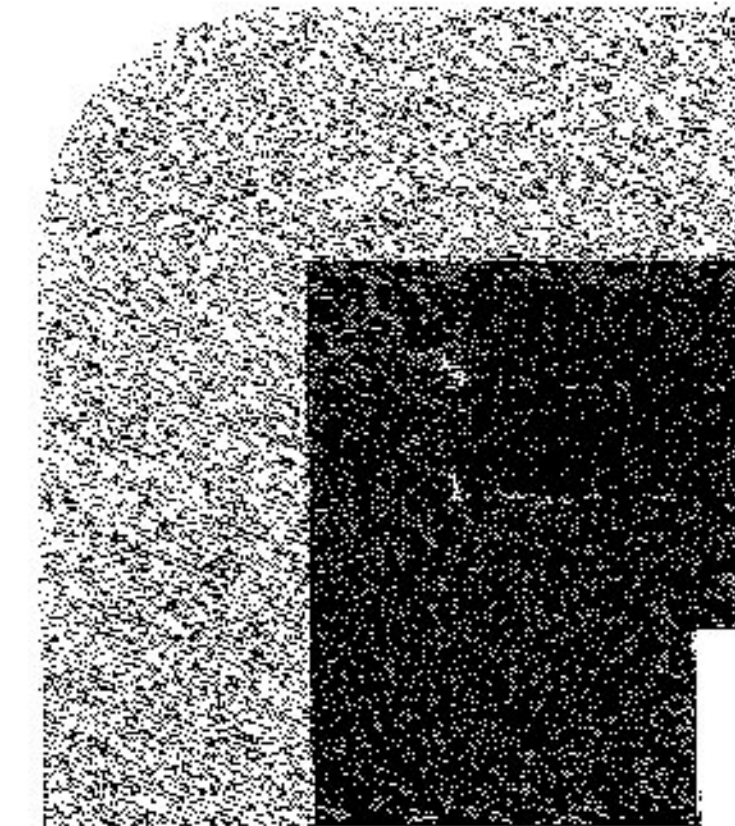
CAD of Examples of Backplates with 2" Tape



Dimensions rounded to the nearest 0.1"  
 Dimensions shown for 1-section backplate  
 (vertical height) are equal to dimensions  
 shown for 2" width tape

**Retroreflective Tape Specifications**

- Type: Prismatic, Series 3930 or 3990
- Color: Yellow (standard), white (optional)
- Width: 1, 2, or 3 inches
- Manufacturer: 3M



Close-up of Reflective Tape  
(louvered backplate)

**Retroreflection**

Retroreflection occurs when a surface reflects a portion of the light from a source (headlights) directly back to an observer (driver) located near the source.

Retroreflective tape utilizes "cube corner reflection" to create the reflection back toward the source of the light. Small retroreflective "lens elements" embedded in the tape have three mutually perpendicular surfaces that refract a light ray (headlight beam) off the three surfaces and return it toward its source.

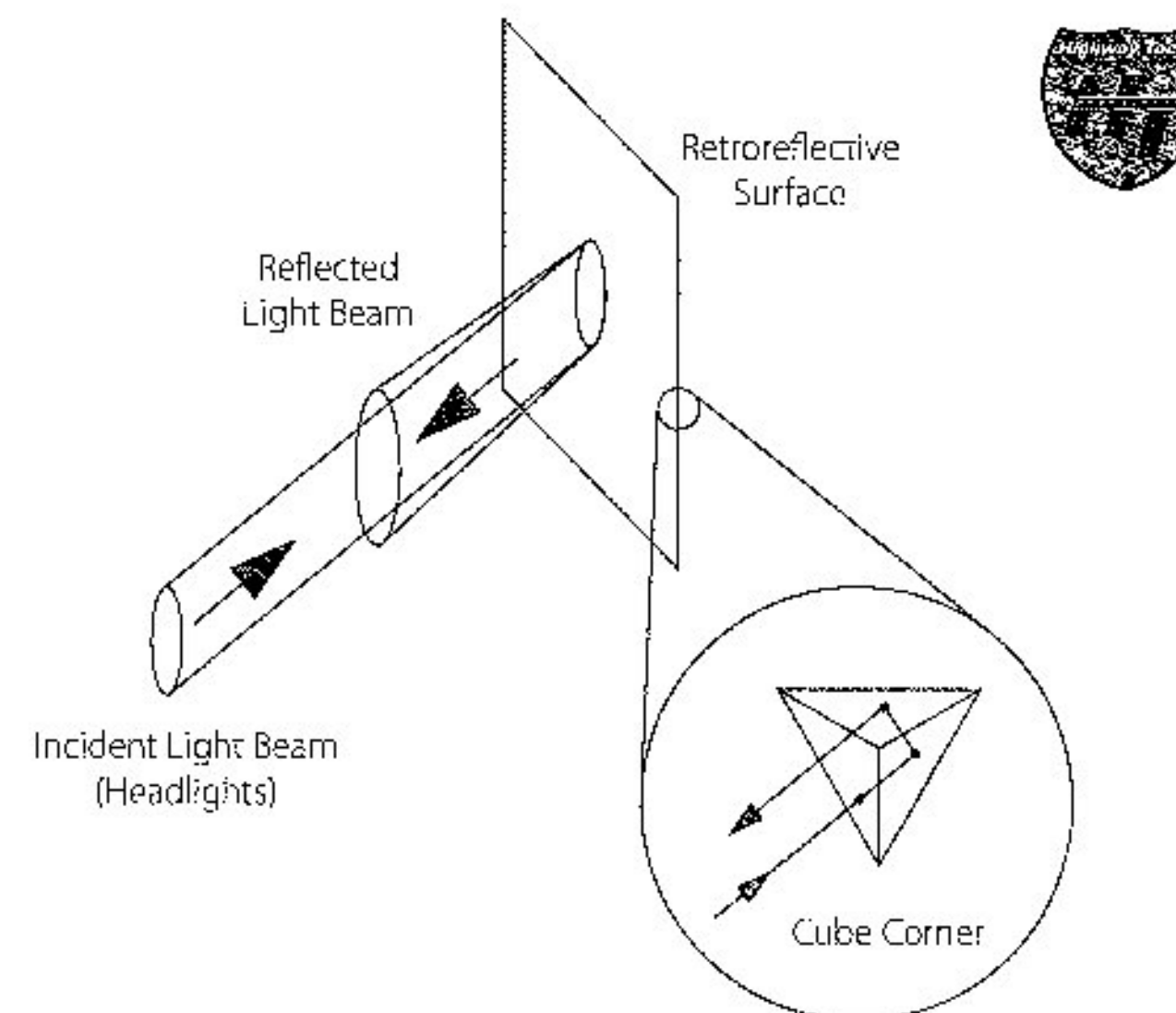


Diagram of Retroreflection

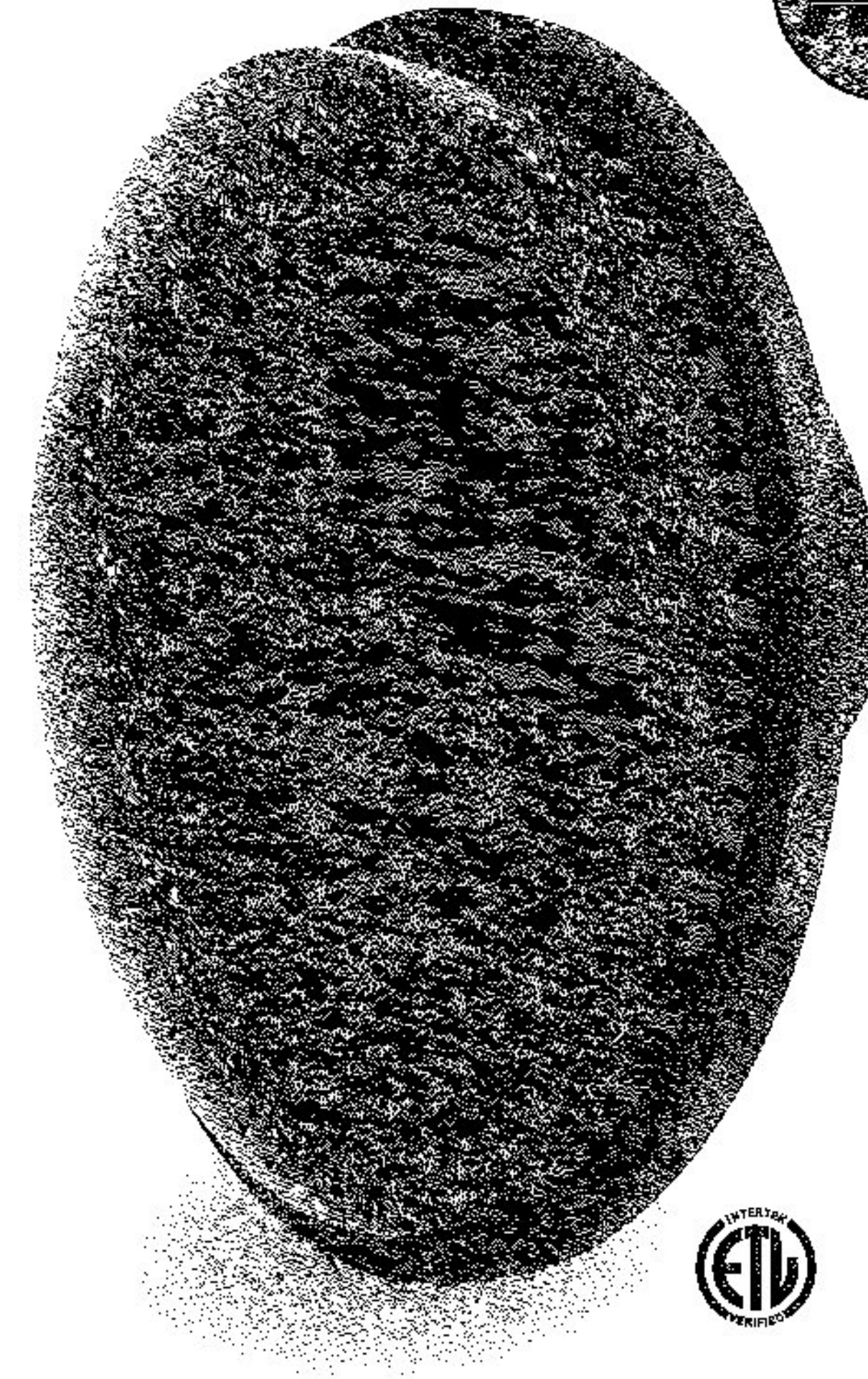
To learn more about  
 McCain's Integrated Traffic  
 Solutions, please contact  
[info@mccain-inc.com](mailto:info@mccain-inc.com) or  
 call (760) 727-8100



Lighting

**APPROVED**  
By Ian Degutis at 7:43 am, Jun 27, 2016

**GTX™ City**  
**VLA Model**  
**LED Signal Modules**  
8 and 12 inch  
Incandescent look (120V)



**Robust Features**

- Optimal thermal management for longer life.
- Provides performance under extreme field temperature conditions.

**Innovative Design**

- Low profile module permits efficient installation into existing traffic housings.
- Power consumption levels allow compatibility with most controllers.
- Mask compatible to fit your unique signaling needs.\*

**Outstanding Performance**

- High-brightness central light source and custom optical lensing distribute light uniformly and efficiently.
- Rigorously tested for long life design and low maintenance costs.
- Excellent color uniformity.

**Meets Rigorous Certification & Testing Standards**

- Intertek ETL Verified compliant.
- Compliant with ITE VTCSH LED Circular Signal Supplement dated June 27<sup>th</sup> 2005.
- CSA approved version available.

\* Sold separately. Refer to masks datasheet TRAF208.



imagination at work

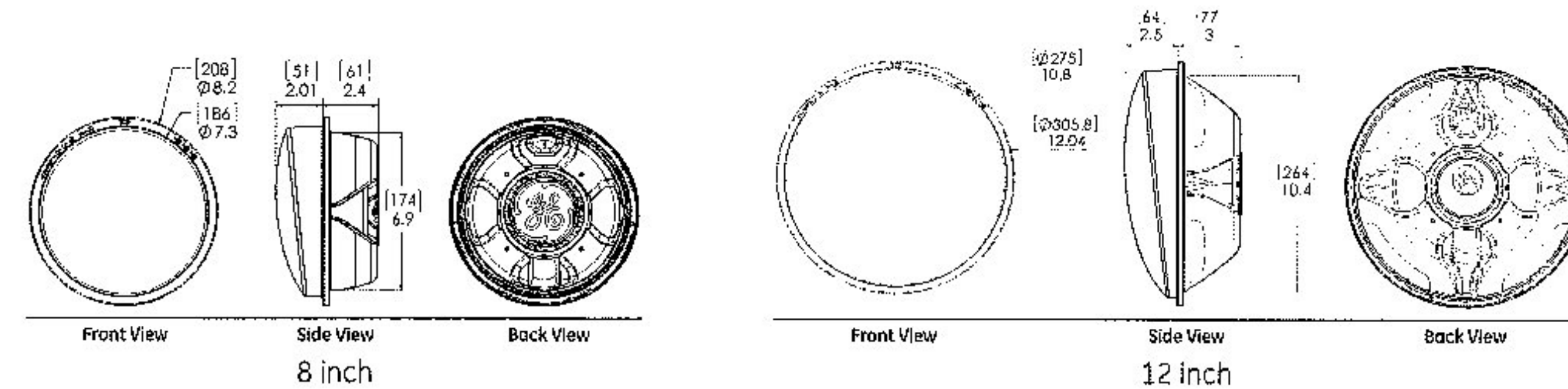


The Greatest Signals Stand the Test of Time.™

# GTX™ City LED Signal Modules

- 8 and 12 inch

Mechanical Outline Dimensions in inches (mm)



## Design Compliance

Luminous Intensity	ITE VTCSH-LED Circular Signal Supplement -June 2005
Chromaticity	ITE VTCSH-LED Circular -June 2005
Moisture Resistance	Blown Wind Rain MIL-STD-810F method 506.4
Mechanical Vibration	MIL-STD-883 Method 2007
Electronic Noise	FCC Title 47 Sub. B Sec 15 <sup>1</sup>
Transient Voltage Protection	Sec. 2.1.6 NEMA TS2-2003, 300V, 2500W Sec. 2.1.6 NEMA TS2-2003, 600V, 10µF Sec. 2.1.8 NEMA TS2-2003, 1kV, 2Ω
Controller Compatibility	ITE VTCSH-LED Circular Signal Supplement -June 2005
Wiring	NFPA 70, National Electric Code
Transient Suppression	Sec. 8.2 IEC 61000-4-5 & Sec. 6.1.2 ANSI/IEEE C62.41.2 - 2002, 3KV, 2 Ω Sec. 8.0 IEC 61000-4-12 & Sec. 6.1.1 ANSI/IEEE C62.41.2 - 2002, 6KV, 30 Ω

## Operating Specifications

Operating Temperature Range*	-40 to +74°C (-40 to +165°F)
Operating Voltage Range	80 to 135 V (60Hz AC)
Power Factor (PF)	> 90%
Total Harmonic Distortion (THD)	< 20%
Minimum Voltage Turn-Off (VTO)	35 V
Turn-On / Turn-Off Time	< 75 ms
Lens & Shell Material	UV Stabilized Polycarbonate
Wiring	8 in lamp: 40in, 20 AWG, Color Coded with Strain Relief** 12 in lamp: 40in, 20 AWG, Color Coded with Strain Relief**

\* Operating Temperature Range per ITE 2005, Section 3.3.2  
\*\* For CSA approved version: 40in, 18AWG, Color Coded with Strain Relief

## Product Information

Part Number	Color	Size	Voltage	Beam Angle	Height	Weight
DR4-RTFB-VLA	Tinted	8	120V - 60Hz	6.7	628	165
DR4-RCFB-VLA	Clear	8	120V - 60Hz	6.7	628	165
DR4-YZFB-VLA	Tinted	8	120V - 60Hz	10.9	588	410
DR4-YTFB-VLA	Tinted	8	120V - 60Hz	7.9	589	410
DR4-YCFB-VLA	Clear	8	120V - 60Hz	7.9	589	410
DR4-GTFB-VLA	Tinted	8	120V - 60Hz	7.3	499	215
DR4-GCFB-VLA	Clear	8	120V - 60Hz	7.3	499	215
DR6-RTFB-VLA	Tinted	12	120V - 60Hz	6.7	625	365
DR6-RCFB-VLA	Clear	12	120V - 60Hz	6.7	625	365
DR6-YZFB-VLA	Tinted	12	120V - 60Hz	10.9	588	910
DR6-YTFB-VLA	Tinted	12	120V - 60Hz	9.9	589	910
DR6-YCFB-VLA	Clear	12	120V - 60Hz	9.9	589	910
DR6-GTFB-VLA	Tinted	12	120V - 60Hz	8.4	501	475
DR6-GCFB-VLA	Clear	12	120V - 60Hz	8.4	501	475

Distributed by:

6 Sakinon Road - P.O. Box 1209 - Sakinon, ME 04781  
ME 4781 - Tel: (207) 775-2119 - Fax: (207) 775-2111  
NY Office - Tel: (907) 269-4081 - Fax: (907) 250-2162

Standard product equipped with universal connectors (insulated spade-quick disconnect).  
All colors available in tinted or clear lens.  
<sup>1</sup> Class A  
<sup>2</sup> Measured at vertical angle of -2.5° and at horizontal angle of 0°.



GE Lighting • 1-888-MY-GE-LED • www.gelighting.com  
1-888-69-43-533 for North America • or +1.216.266.2419

GE Lighting Solutions, LLC is a subsidiary of the General Electric Company. "The Greatest Signals Stand the Test of Time" are trademarks of GE Lighting, LLC. The GE brand and logo are trademarks of the General Electric Company. © 2014 GE Lighting, LLC. Information provided is subject to change without notice. All values are design or typical values when measured under laboratory conditions.

GE  
Lighting Solutions

**APPROVED**  
By Ian Degutis at 7:43 am, Jun 27, 2016

Incandescent look

# GT1™ LED Arrow Signals

12 inch Red, Yellow, Green

### Excellent Appearance & Visibility

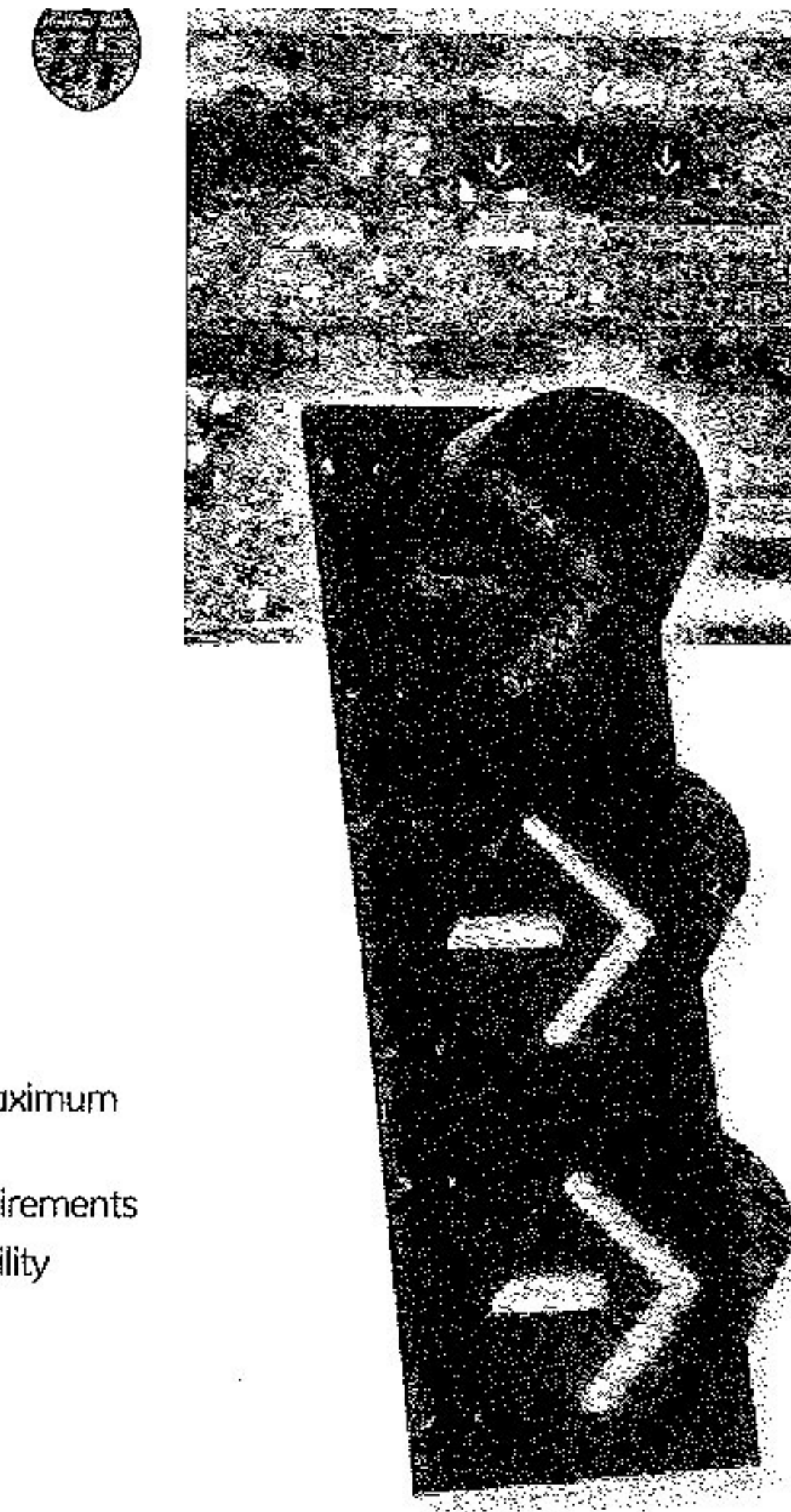
- Efficient optical design allows omnidirectional arrow placement with maximum light output and expanded view
- Expanded view for fixed and span wire applications meets new ITE requirements
- Excellent color uniformity creates an incandescent look for easy readability
- Improved luminous intensity uniformity exceeds new ITE requirements
- New or retrofit use

### Outstanding Reliability & Robust Operation

- High efficiency and high-brightness LED light source
- Improved failed state impedance protection detects the loss of LED load
- Optimized thermal management for longer life
- O-ring gasket and over-molded electrical connector provide increased moisture and dust protection
- Provides performance under extreme field temperature conditions

### Meets Rigorous Certification & Testing Standards

- Intertek ETL Verified compliant
- DOE compliant
- CSA approved
- Using MIL-STD-810F for environmental robustness, passed reliability and qualification testing including high temperature, high humidity cycling
- Compliant with the new ITE VTCSH LED Vehicle Arrow Traffic Signal Supplement dated July 1, 2007



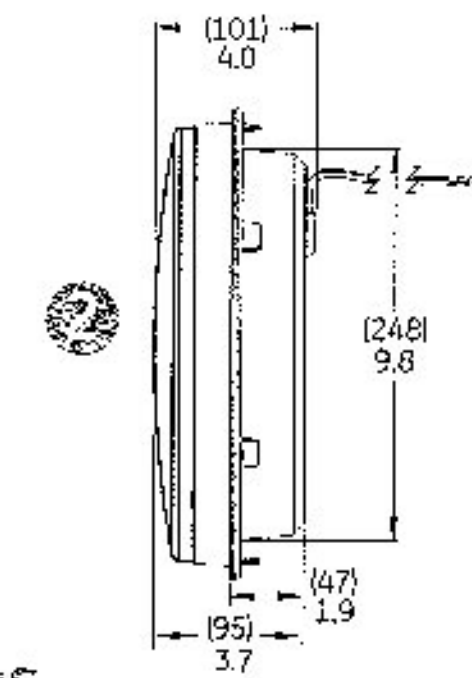
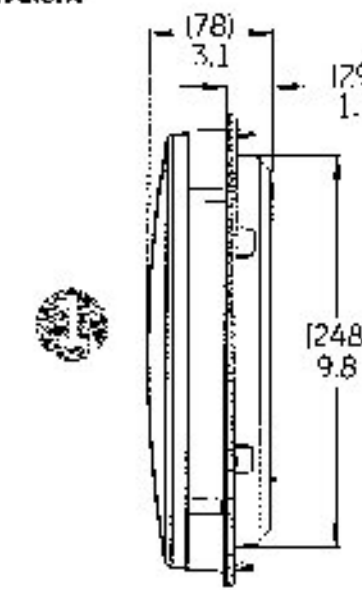
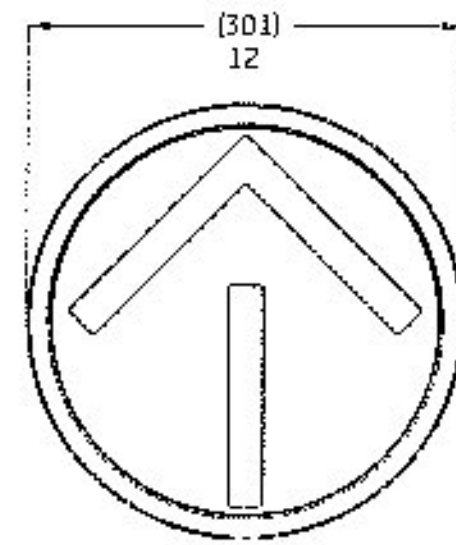
The Greatest Signal Stand the Test of Time™

# GT1™ LED Arrow Signals

- 12 inch module

## Mechanical Outline

Dimensions in inches. (mm) indicates metric equivalent



## Design Compliance

Parameter	Compliance
Luminous Intensity	ITE VTCSH-LED Vehicle Arrow Traffic Signal Supplement, July 2007
Chromaticity	ITE VTCSH-LED Vehicle Arrow Traffic Signal Supplement, July 2007
Moisture Resistance	NEMA STD 250 Type 4 - 1991 Blown Wind Rain MIL-STD-810F method 506.4
Mechanical Vibration	MIL-STD-883 Method 2007
Electronic Noise	FCC Title 47 Sub. B Sec.15 <sup>1</sup>
Transient Voltage Protection	Sec. 2.1.6 NEMA TS2-2003, 300V, 2500W Sec. 2.1.6 NEMA TS2-2003, 600V, 10µF Sec. 2.1.8 NEMA TS2-2003
Controller Compatibility	ITE VTCSH-LED Vehicle Arrow Traffic Signal Supplement, July 2007
Wiring	NFPA 70, National Electric Code
Transient Suppression	Sec. 8.2 IEC 1000-4-5 & Sec. 6.1.2 ANSI/IEEE C62.41.2 - 2002, 3kV, 2Ω Sec. 8.0 IEC 1000-4-12 & Sec. 6.1.1 ANSI/IEEE C62.41.2 - 2002, 6kV, 30Ω

## Operating Specifications

Parameter	Value
Operating Temperature Range*	-40 to +74°C (-40 to +165°F)
Operating Voltage Range	80 to 135 V (60Hz AC)
Power Factor (PF)	> 90 %
Total Harmonic Distortion (THD)	< 20 %
Voltage Turn-Off (VTO)	35 V
Turn-On / Turn-Off Time	< 75msec
Lens & Shell Material	UV Stabilized Polycarbonate
Wiring	16 AWG, Color Coded with Strain Relief

\* Performed in compliance with ITE test method described in the technical notes

## Product Information

Model Number	Size (in)	AC Voltage (Nominal)	Power (W) (Nominal)	Wavelength (nm) (Nominal)	Maintained Intensity (cd) (Minimum)	Luminous Intensity Spec	Mechanical Outline
DR6-RTAAN-17A	12	120V - 60Hz	5	626	58	A & B	1
DR6-YTAAN-17A*	12	120V - 60Hz	9	589	146	A & B	1
DR6-YTAAN-17A-YX	12	120V - 60Hz	6	589	146	A	2
DR6-GTAAN-17A	12	120V - 60Hz	5	500	76	A & B	1
DR6-GCAAN-17A	12	120V - 60Hz	5	500	76	A & B	1


Standard product equipped with universal connectors (spade-quick disconnect).

All lamps available in tinted or clear lens.

\* Luminous intensity measured at T<sub>a</sub> = 25°C for yellow (these models are not Intertek ETL Verified compliant).

<sup>1</sup> Class A

Distributed by:



**Highway Tech**  
 6 Sabattus Road • P.O. Box 1209 • Sabattus, ME 04280  
 ME Office - Tel. (207) 375-8248 • Fax (866) 242-7914  
 NY Office - Tel. (607) 299-1604 • Fax (866) 350-3162



GE Lighting Solutions • 1-888-MY-GE-LED • www.gelighting.com  
 1-888-69-43-533

GE Lighting Solutions, LLC is a subsidiary of the General Electric Company. GT1 and "The Greatest Signal Since the Test of Time" are trademarks of GE Lighting Solutions, LLC. The GE brand and logo are trademarks of the General Electric Company. © 2013 GE Lighting Solutions, LLC. Information provided is subject to change without notice. All values are design or typical values when measured under laboratory conditions.

TRAF064-R050913