

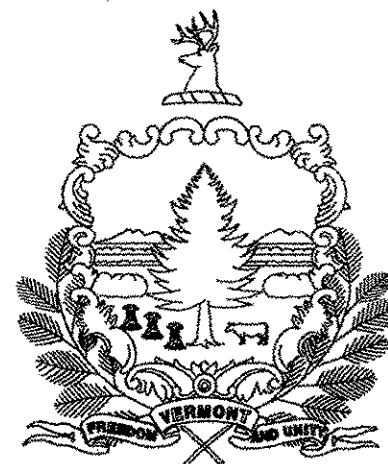
INDEX OF SHEETS

1. TITLE SHEET
2. QUANTITY SHEET
3. TIE SHEET
4. BORING DATA SHEET
5. TRAFFIC SIGNAL LAYOUT SHEET
6. TRAFFIC SIGNS AND PAVEMENT MARKINGS SHEET
7. TRAFFIC SIGN SUMMARY SHEET
8. TRAFFIC CONTROL SHEET
9. TRAFFIC SIGNAL NOTES
10. SINGLE MAST ARM CANTILEVER WITH LIGHTING / FOOTING DETAIL SHEET
11. GENERAL NOTES SHEET
- 12-13. MAST ARM CROSS SECTION SHEETS

VTRANS STANDARDS

D-20	03/03/03
E-100	01/02/04
E-100A	01/02/04
E-101	05/30/03
E-102	06/30/03
E-106	03/01/04
E-107	06/30/03
E-107A	08/08/95
E-110	08/08/95
E-120	08/08/95
E-123	03/16/04
E-135	08/18/95
E-136B	08/08/95
E-152	05/01/04
E-171A	08/09/95
E-171B	08/09/95
E-171C	08/09/95
E-172	08/09/95
E-173	08/09/95
E-175	11/17/93
E-191	02/01/99
E-192	10/12/00
E-193	08/18/95
G-1	01/03/00
G-19	11/15/02

STATE OF VERMONT AGENCY OF TRANSPORTATION

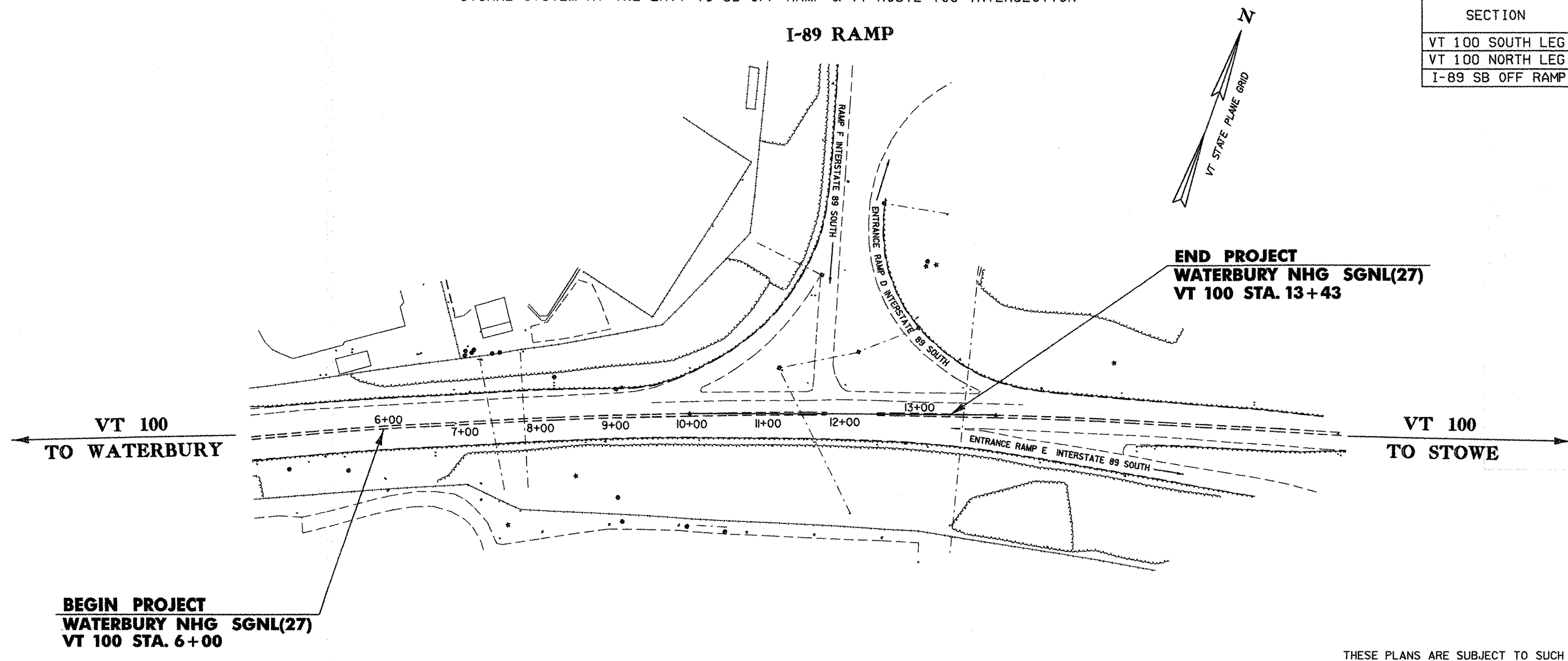
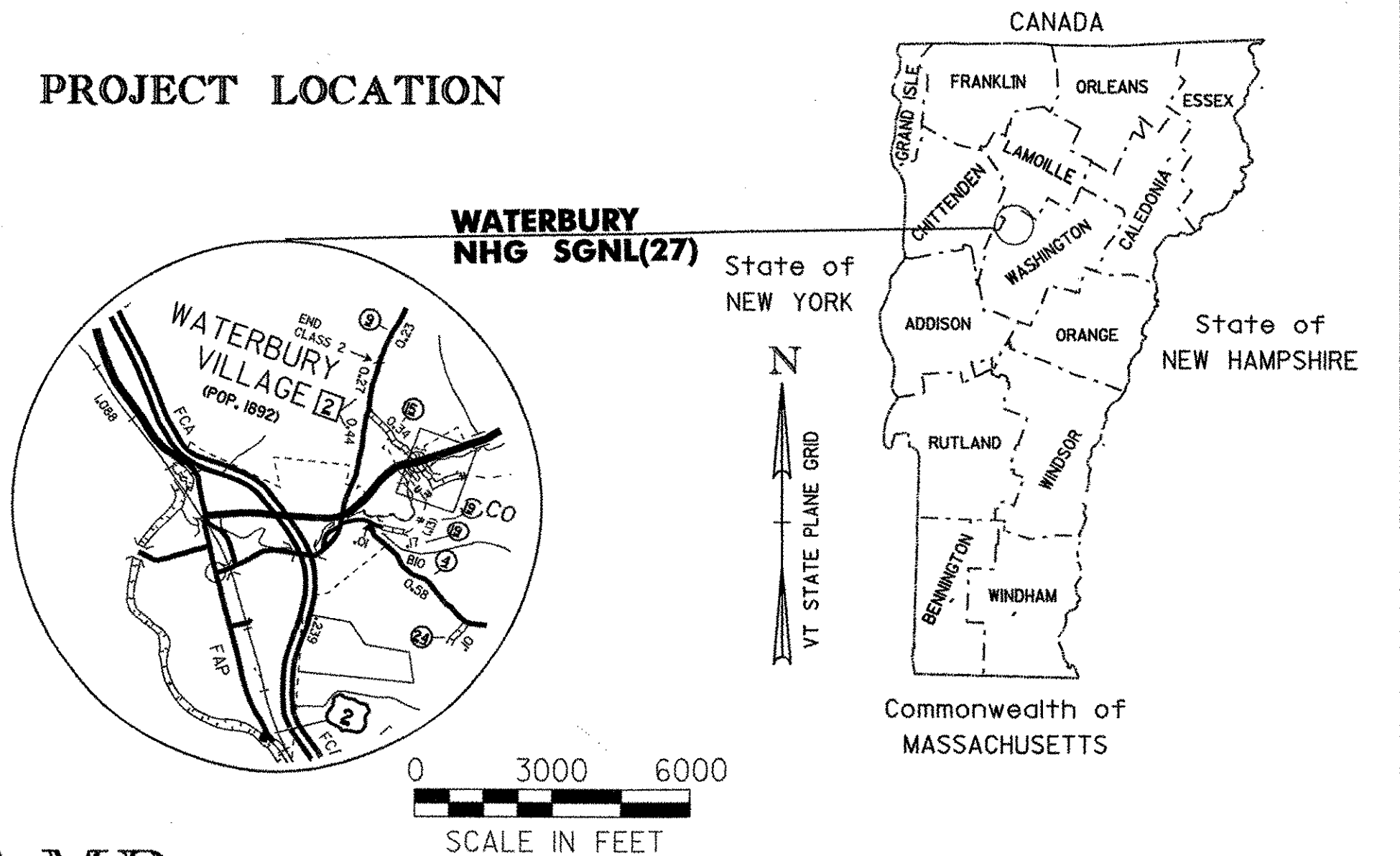


PROPOSED IMPROVEMENT VT ROUTE 100 & I-89 EXIT #10 SB OFF RAMP TOWN: WATERBURY COUNTY: WASHINGTON

BEGINNING AT A POINT ON VT ROUTE 100 APPROXIMATELY 0.095 MILES EAST OF THE
US ROUTE 2 & VT ROUTE 100 INTERSECTION, AND EXTENDING EASTERLY 0.141 MILES

LENGTH OF PROJECT = 743 FEET = 0.141 MILES

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES INSTALLING A NEW TRAFFIC
SIGNAL SYSTEM AT THE EXIT 10 SB OFF RAMP & VT ROUTE 100 INTERSECTION



TRAFFIC DATA

SECTION	AADT		DHV		%T		%D	
	2007	2012	2007	2012	2007	2012	2007	2012
VT 100 SOUTH LEG	12700	13500	1400	1500	5.6	6.6	56	56
VT 100 NORTH LEG	14000	14800	1500	1600	2.4	2.7	74	74
I-89 SB OFF RAMP	2600	2900	280	310	1.9	2.3	100	100

RECORD PLANS

CONTRACTOR: KINGSBURY CONSTRUCTION CO., INC. - WAITSFIELD, VT

RESIDENT ENGINEER: TOM MANCINI

CONSTRUCTION BEGAN: JULY 7, 2008

CONSTRUCTION COMPLETE: SEPTEMBER 21, 2008

RECORD PLANS BY: TOM MANCINI & N. GARBACIK

I HEREBY CERTIFY THAT ALL THE CONSTRUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.

BY Tom Mancini RESIDENT ENGINEER
DATE 4/14/09

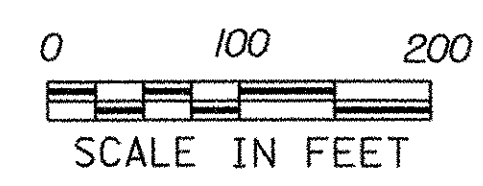
NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

CONVENTIONAL SYMBOLS

COUNTY LINE	———
TOWN LINE	———
LIMITS OF ACCESS	—○—○—○—○—
POINT OF ACCESS	X
FENCE LINE	X—X—X—X—X—
STONE WALL	○—○—○—○—○—○—
TRAVELED WAY	———
GUARD RAIL	○—○—○—○—○—
RAILROAD	———
SURVEY LINE	———
CULVERT	———
POWER POLE	⊕
TELEPHONE POLE	⊕
TREES	⊕
CONTROL OF ACCESS	———
PROPERTY LINE	———
R.O.W. TAKING LINE	—○—○—○—○—
SLOPE RIGHTS	———
TOP OF CUT	———
TOE OF SLOPE	———

SURVEYED BY : R. GILMAN & R. BULLOCK
SURVEYED DATE : 10/06/2000

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (92)



THESE PLANS ARE SUBJECT TO SUCH ENGINEERING CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY ADMINISTRATION OR THE DIRECTOR OF PROGRAM DEVELOPMENT.

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2006, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 15, 2006 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

/traf/05b140/tb140bdr.dgn/tb140+11.1

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATOR

APPROVED Mark D. Klaber DATE 11-26-07
DIRECTOR OF PROGRAM DEVELOPMENT

APPROVED John F. Schmitt DATE 11-8-07

PROJECT MANAGER : BRUCE T. NYQUIST

PROJECT NAME : WATERBURY
PROJECT NUMBER : NHG SGNL(27)

SHEET 1 OF 13 SHEETS

GPS CONTROL POINTS

HVCTRL #1

STANDARD DISK STAMPED

189 Exit 10

N = 671937.318
E = 1574199.762
ELEV. = 498.851

To reach from the intersection of Vt route 100 no. and US 2, at the northwest end of Waterbury Village, go northeast along Vt. 100 for 0.4 miles, to the southeast end of the Vt 100 bridge over I-89 and the site of the mark in the top of a concrete island just south of the bridge. It is 9.8 ft northwest of and about 0.7 ft higher than the centerline of the northbound side of Vt 100. 32.5 ft northwest of the point where the island switches from pavement to concrete. 2.0 ft northwest of the southeast edge of the concrete island. 2.0 ft southeast of the northwest edge of the island, and 26.2 ft northwest of a fiberglass witness post.

HVCTRL #2

STANDARD DISK STAMPED

189 Exit 10 Az Mk

N = 671369.002
E = 1572577.137
ELEV. = 420.209

In the northeast quadrant of the intersection of Vt route 100 north and US route 2, at the northwest end of Waterbury Village. The mark is set in the top of the northeast corner of a 4 ft square concrete base for a drain. It is 28.5 ft north of and about 4 ft lower than the north edge of pavement of Vt 100. 50 ft east of and about 2.3 ft lower than the east edge of US 2. 40.0 ft south of a chain link fence, 1.0 ft southwest of a fiberglass witness post.

- DESCRIPTION PROVIDED BY VERMONT AGENCY OF TRANSPORTATION GEODETIC SURVEY UNIT
- TO ALLOW THE STATE PLANE COORDINATES TO FIT THE AGENCY DESIGN PLANE, SUBTRACT 600,000 FROM THE NORTHING AND SUBTRACT 1,500,000 FROM THE EASTING

TRAVERSE TIES

NORTH =
EAST =
ELEV. =

No Traverse

NORTH =
EAST =
ELEV. =

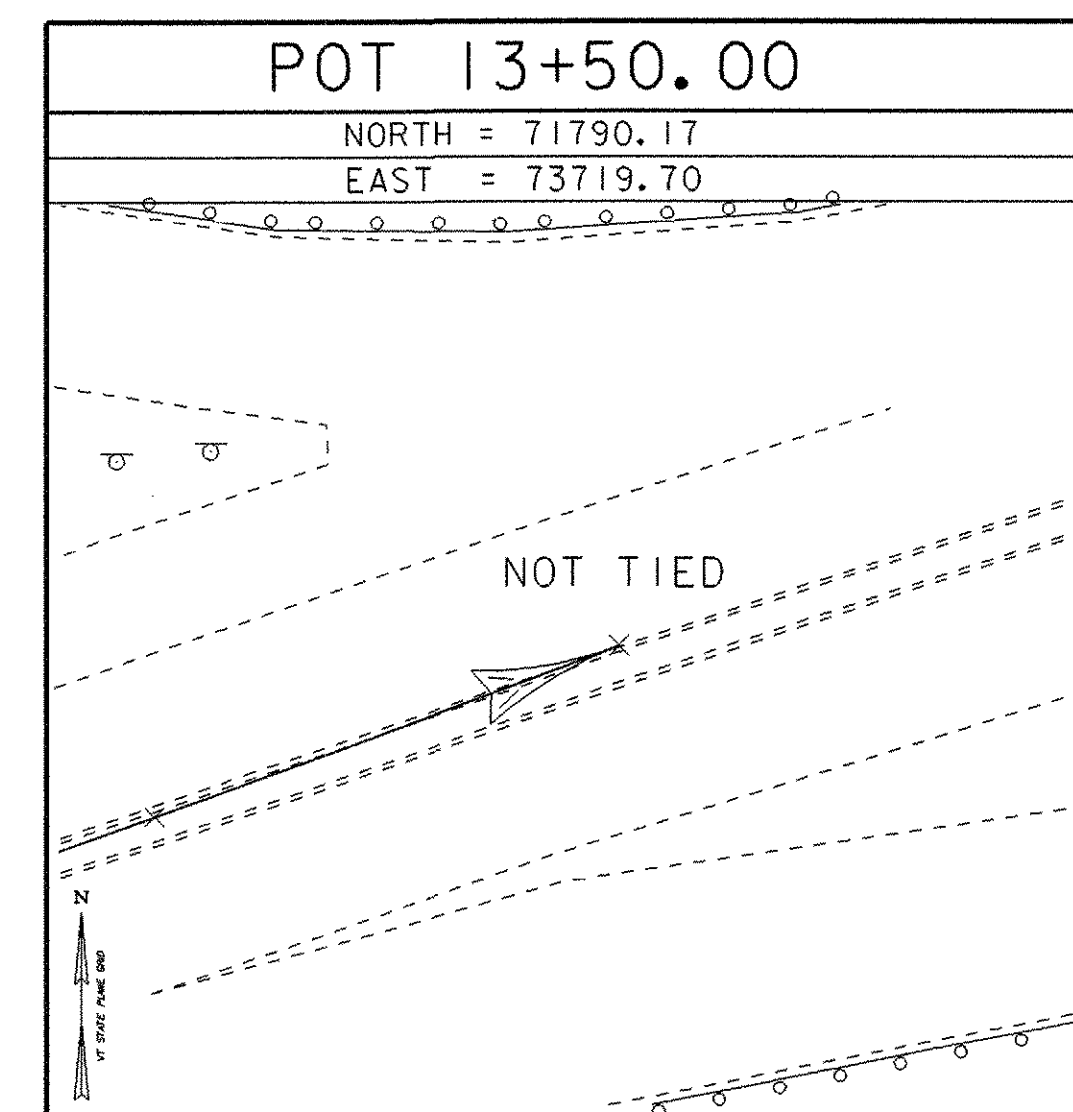
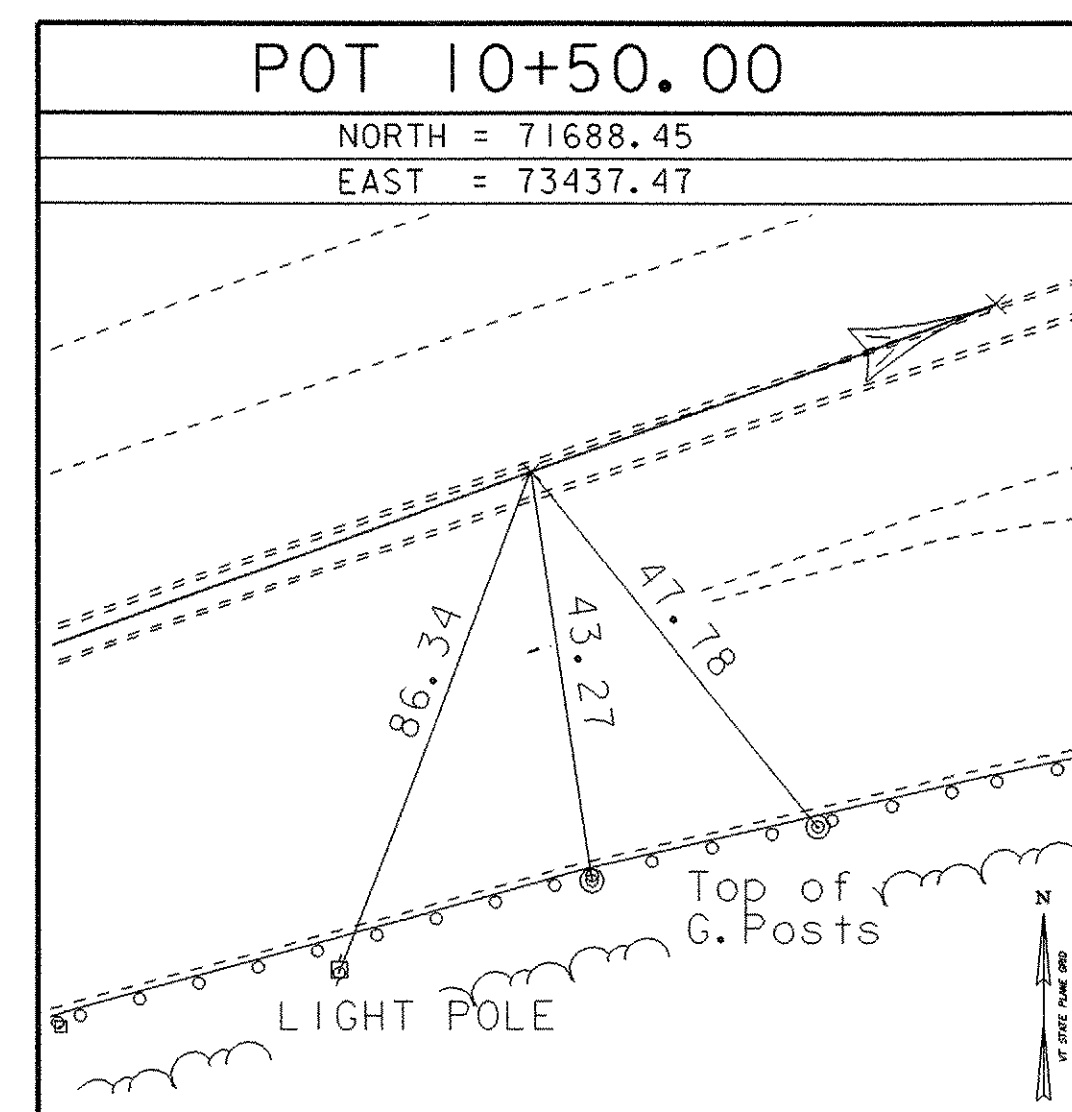
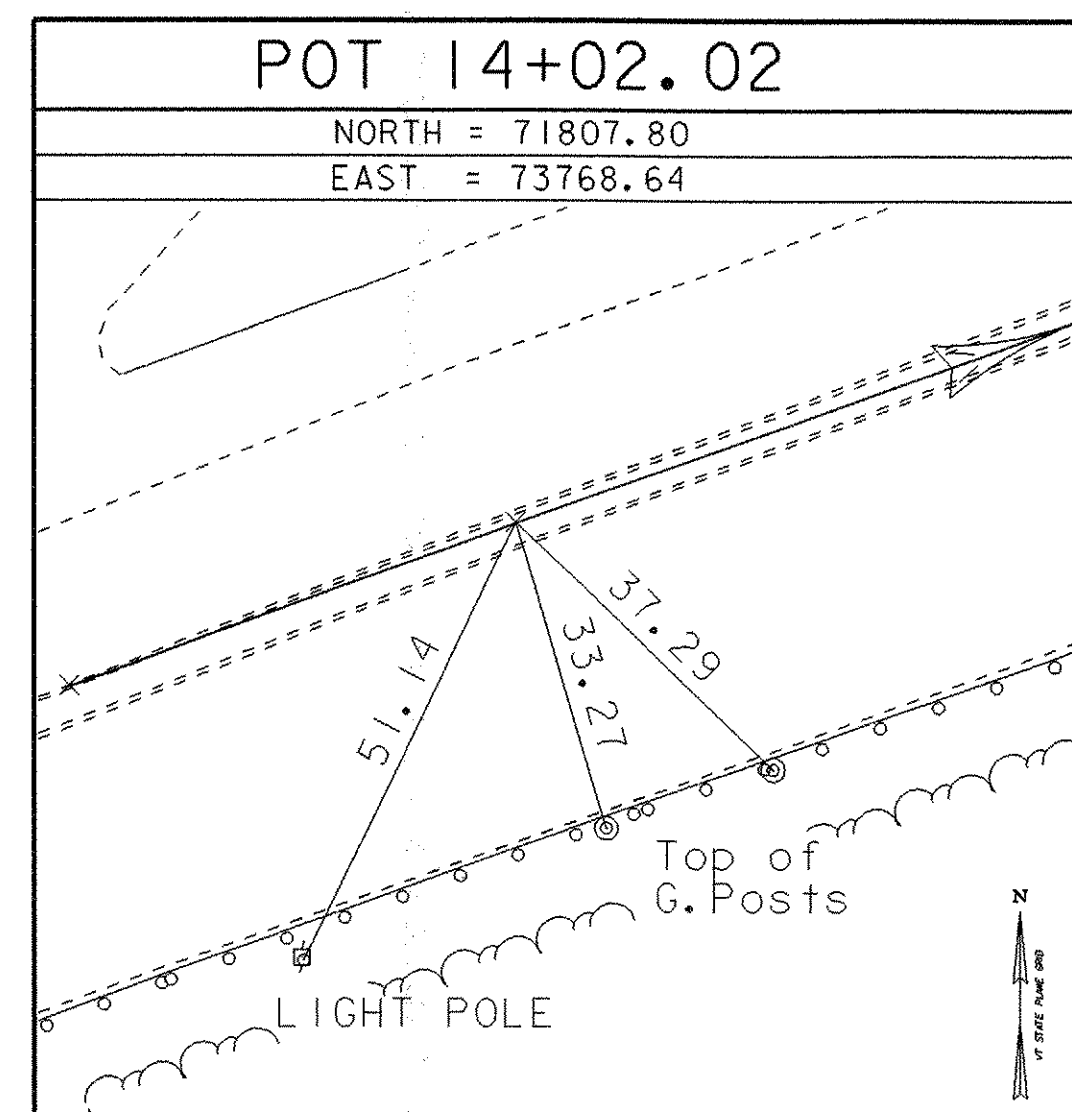
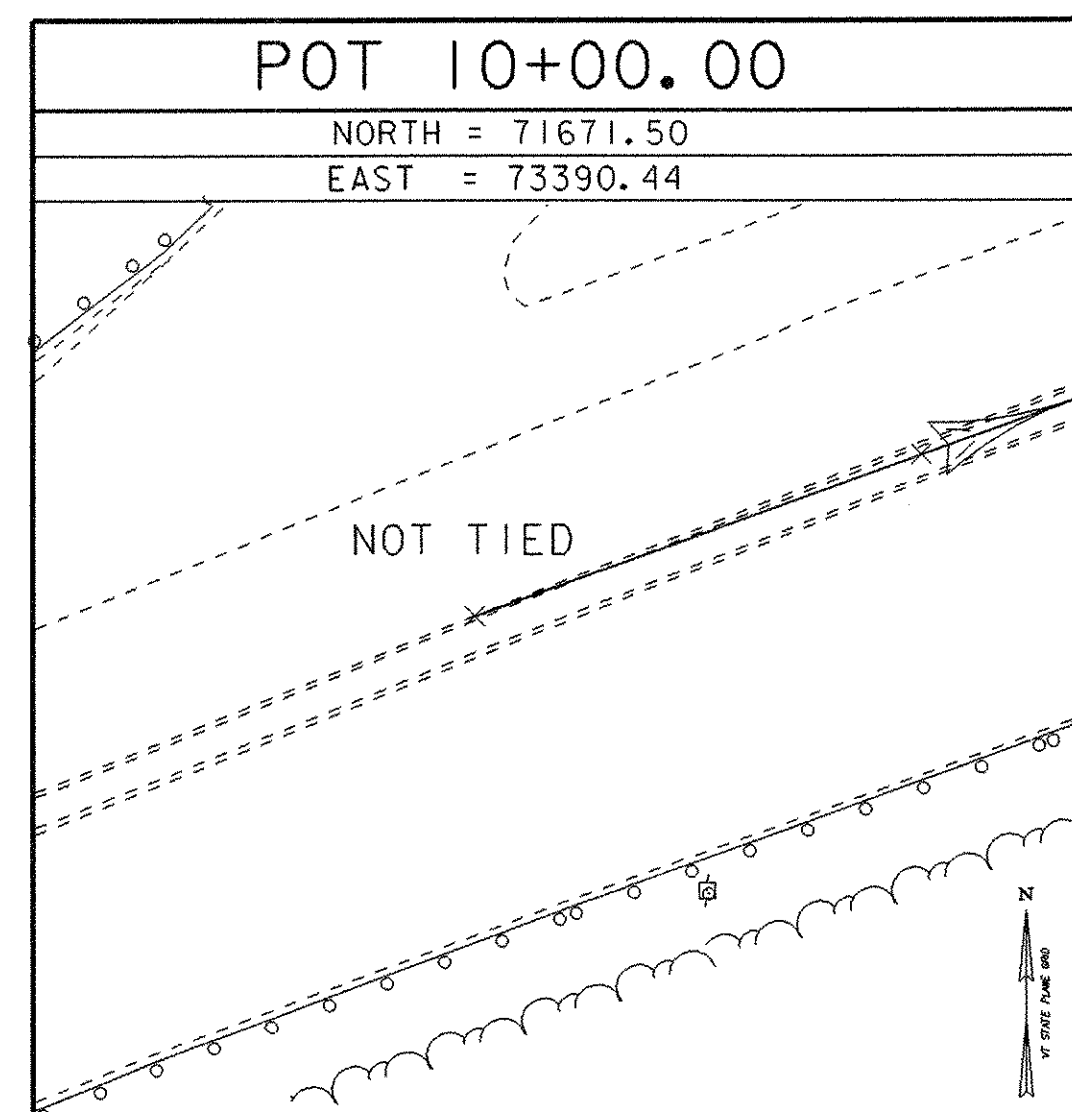
NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

• MAIN TRAVERSE COMPLETED Both GPS control points are in project area no traverse was required

ALIGNMENT TIES



NORTH =
EAST =

• ALIGNMENT STAKED 03/29/07 by R. Gilman P.C. & P. Winters & R. Bullock

DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83 (92)
ADJUSTMENT	none

PROJECT NAME: Waterbury	
PROJECT NUMBER: NHG SGNL (27)	
FILE NAME: 05b140/survey/x05b140t1.dg	PLOT DATE: 13-NOV-2007
PROJECT LEADER: J. SCHULTZ	DRAWN BY: R. Bullock
DESIGNED BY: B. MCAVOY	CHECKED BY: J. SCHULTZ
+b140+ie.l	SHEET 3 OF 13

SOIL CLASSIFICATION

AASHTO

A1	GRAVEL AND SAND
A2	SILTY OR CLAYEY GRAVEL AND SAND
A3	FINE 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 1/2" 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
HS	HOLLOW STEM AUGER
AX	CORE SIZE 1 1/8"
BX	CORE SIZE 1 1/2"
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	TO LEDGE OR BOULDER
NR	NO RECOVERY
REC.	RECOVERY
%REC.	PERCENT RECOVERY
ROD	ROCK QUALITY DESIGNATION
CBR	CALIFORNIA BEARING RATIO
<	LESS THAN
>	GREATER THAN
R	REFUSAL (>100)

COLOR

blk	BLACK	prk	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		



STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING NUMBER: B-101
SHEET 1 of 1
DATE STARTED: 6/21/07
DATE COMPLETED: 6/21/07

PROJECT NAME: WATERBURY
SITE NAME: POLE BASE
STATION: 12+16
OFFSET: -36.90
VTSPG: N 671779.38 ft E 1573580.93 ft

PROJECT NUMBER: NHG SGNL(27)
SITE NUMBER: VT-100 & I-89 Ramp "G"
GROUND ELEVATION: 484.1 ft
GROUNDWATER DEPTH: NWD
PROJECT PIN NUMBER: 05B140

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: WERNER

BORING RIG: LAG TRACK RIG w/AUTO HAMMER
BORING TYPE: HOLLOW STEM AUGER
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: CAA

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)	LL (%)	PI (%)
		A-1-a, SaGr, brn, Moist, Rec. = 1.0 ft	18	6.2	51.8	33.4	14.8		
		A-2-4, SiGrSa, brn, Moist, Rec. = 1.75 ft	23	7.7	33.6	45.5	20.9		
5		A-1-b, SiGrSa, brn, Moist, Rec. = 0.4 ft	38	7.1	36.1	42.8	21.1		
		A-2-4, SaSiGr, gry, Moist, Rec. = 1.2 ft		7.5	37.7	27.5	34.8		
		Lab Note, Fill Material: Broken thin angular rock particles with sand., brn, Dry, Rec. = 1.3 ft	75	2.4	60.6	25.3	14.1		
		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Moist, Rec. = 0.7 ft	19	3.9	59.5	28.1	12.4		
10		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Moist, Rec. = 1.3 ft	24	3.8	69.2	20.5	10.3		
		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Dry, Rec. = 1.4 ft	28	1.7	63.3	23.6	13.1		
15		A-4, Cisi, gry, Moist, Rec. = 0.5 ft	23	26.0	6.3	7.7	86.0	35	8
		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Moist, Rec. = 0.8 ft		5.9	51.0	30.7	18.3		
20		A-6, GrSiCl with broken thin angular rock particles, gry, Moist, Rec. = 1.0 ft	5	25.9	26.6	6.8	66.6	40	16
25		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Moist, Rec. = 1.6 ft	28	11.2	54.2	27.3	18.5		
30		A-6, SiCl, gry, Moist, Rec. = 1.25 ft	8	27.4	0.9	7.0	92.1	37	13
		Hole stopped @ 32.0 ft							

LOG OF BORING - WATERBURY NHG SGNL(27) (P.1) VT AUT.G01 9/20/07

DEFINITIONS (AASHTO)

- BEDROCK (LEDGE)** - ROCK IN ITS NATIVE LOCATION OF INDEFINITE THICKNESS.
- BOULDER** - A ROCK FRAGMENT WITH AN AVERAGE DIMENSION >12 INCHES.
- COBBLE** - ROCK FRAGMENTS WITH AN AVERAGE DIMENSION BETWEEN 3 AND 12 INCHES.
- GRAVEL** - ROUNDED PARTICLES OF ROCK <3" AND > 0.075" (#10 SIEVE).
- SAND** - PARTICLES OF ROCK < 0.075" (#10 SIEVE) AND > 0.0029" (#200 SIEVE).
- SILT** - SOIL < 0.0029" (#200 SIEVE), NON OR SLIGHTLY PLASTIC AND EXHIBITS NO STRENGTH WHEN AIR-DRIED.
- CLAY** - FINE GRAINED SOIL, EXHIBITS PLASTICITY WHEN MOIST AND CONSIDERABLE STRENGTH WHEN AIR-DRIED.
- VARVED** - ALTERNATE LAYERS OF SILT AND CLAY.
- HARDPAN** - EXTREMELY DENSE SOIL, CEMENTED LAYER, NOT SOFTENED WHEN WET.
- MUCK** - SOFT ORGANIC SOIL (CONTAINING > 10% ORGANIC MATERIAL).
- MOISTURE CONTENT** - WEIGHT OF WATER DIVIDED BY DRY WEIGHT OF SOIL.
- FLOWING SAND** - GRANULAR SOIL SO SATURATED (LOOSE) THAT IT FLOWS INTO DRILL CASING DURING EXTRACTION OF WASH ROD.
- STRIKE** - ANGLE FROM MAGNETIC NORTH TO LINE OF INTERSECTION OF BED WITH A HORIZONTAL PLANE.
- DIP** - INCLINATION OF BED WITH A HORIZONTAL PLANE.



STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING NUMBER: B-102
SHEET 1 of 1
DATE STARTED: 6/25/07
DATE COMPLETED: 6/25/07

PROJECT NAME: WATERBURY
SITE NAME: POLE BASE
STATION: 12+05
OFFSET: 35.90
VTSPG: N 671707.22 ft E 1573595.45 ft

PROJECT NUMBER: NHG SGNL(27)
SITE NUMBER: VT-100 & I-89 Ramp "G"
GROUND ELEVATION: 483.24 ft
GROUNDWATER DEPTH: NWD
PROJECT PIN NUMBER: 05B140

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: WERNER

BORING RIG: LAG TRACK RIG w/AUTO HAMMER
BORING TYPE: HOLLOW STEM AUGER
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: CAA

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)	LL (%)	PI (%)
		A-1-b, GrSa, brn, Moist, Rec. = 1.7 ft	17	5.0	45.8	46.7	7.5		
		A-1-b, GrSa, brn, Moist, Rec. = 1.5 ft	25	4.6	42.1	49.6	8.3		
5		No Recovery, Cobbles, Tough augering, 4.0 ft - 6.0 ft	8						
		A-1-b, SaGr, brn-gry, Moist, Rec. = 0.5 ft	11	4.9	52.0	33.4	14.6		
		A-1-a, SaGr, gry, Moist, Rec. = 0.9 ft	19	5.0	60.3	27.1	12.6		
10		A-1-a, SaGr, gry, Moist, Rec. = 0.9 ft	14	5.3	63.5	25.2	11.3		
		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Moist, Rec. = 0.4 ft	7	7.9	61.1	24.4	14.5		
		A-4, Cisi, gry, Moist, Rec. = 0.6 ft		27.6	8.3	6.1	85.6	35	9
		A-4, Cisi, gry, Moist, Rec. = 0.4 ft		21.5	17.3	7.0	75.7	34	8
15		Lab Note, Fill Material: Broken thin angular rock particles with sand., gry, Moist, Rec. = 1.2 ft	14	4.9	62.6	25.3	12.1		
20		Lab Note, Fill Material: Broken angular rock particles with sand., gry, Moist, Rec. = 0.3 ft	21	3.6	60.3	27.9	11.8		
25		Lab Note, Fill Material: Broken angular rock particles with sand., gry, Moist, Rec. = 1.4 ft	36	3.6	63.3	24.1	12.6		
30		A-6, SiCl, gry, Moist, Rec. = 1.5 ft	8	28.6	0.7	8.8	90.5	36	12
		Hole stopped @ 32.0 ft							

LOG OF BORING - WATERBURY NHG SGNL(27) (P.1) VT AUT.G01 9/20/07

GENERAL NOTES

- THE SUBSURFACE EXPLORATIONS SHOWN AND OTHER FACTORS. HEREIN WERE MADE BETWEEN AND BY THE AGENCY.
- ENGINEERING JUDGEMENT 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 JUDGEMENT BY THE CONTRACTOR.
- 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

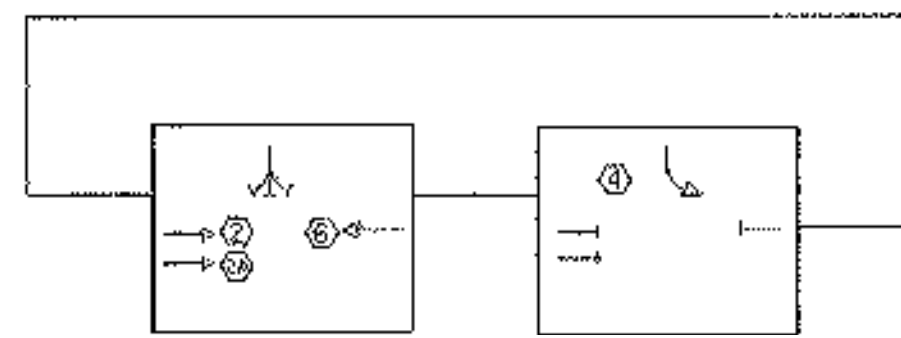
PROJECT NAME: WATERBURY
PROJECT NUMBER: NHG SGNL (27)

FILE NAME: traf\05b140\tb140nul.dgn PLOT DATE: 13-NOV-2007
PROJECT LEADER: J. SCHULTZ DRAWN BY: B. MCAVOY
DESIGNED BY: B. MCAVOY CHECKED BY: J. SCHULTZ
tb140bor.i SHEET 4 OF 13

CONTROLLER TIMING CHART							
VT 100 & I-89 SOUTH RAMP							
PHASE	1	2	3	4	5	6	7
TRAFFIC MOVEMENT	↑	←	←	←	←	↓	↓
MINIMUM GREEN	5	5	5	5	5	5	5
MAXIMUM 1 GREEN	27	25	27	27	27	27	27
MAXIMUM 2 GREEN	29	29	29	29	29	29	29
MAXIMUM 3 GREEN	29	25	29	29	29	29	29
YELLOW CLEARANCE	4	4	4	4	4	4	4
ALL RED CLEARANCE	2	2	2	2	2	2	2
VEH. EXTENSION	2	2	2	2	2	2	2

CONTROLLER TO OPERATE MAXIMUM 2 GREEN TIMINGS FROM 6:00AM-10:00AM
 CONTROLLER TO OPERATE MAXIMUM 1 GREEN TIMINGS FROM 10:00AM-2:30PM
 & 6:00PM-6:00AM
 CONTROLLER TO OPERATE MAXIMUM 3 GREEN TIMINGS FROM 2:30PM-6:00PM

PHASING DIAGRAM



VEHICLE LOOP DETECTORS										
LOOP NO.	LANE	CALL Ø	SIZE	TYPE & NO. TURNS	DELAY OR PRESENCE	INDUCTANCE CALC. ACT.	RESISTANCE CALC. ACT.	LEAKAGE TO GROUND	LOCKING MEMORY	
2	EB	2	6x40	QUAD-2	PRESENCE	381	1.11			
2A	EB	2	6x40	QUAD-2	PRESENCE	377	1.07			
4	SB	4	6x40	QUAD-2	PRESENCE	351	0.72			
6	WB	6	6x40	QUAD-2	PRESENCE	353	0.75			

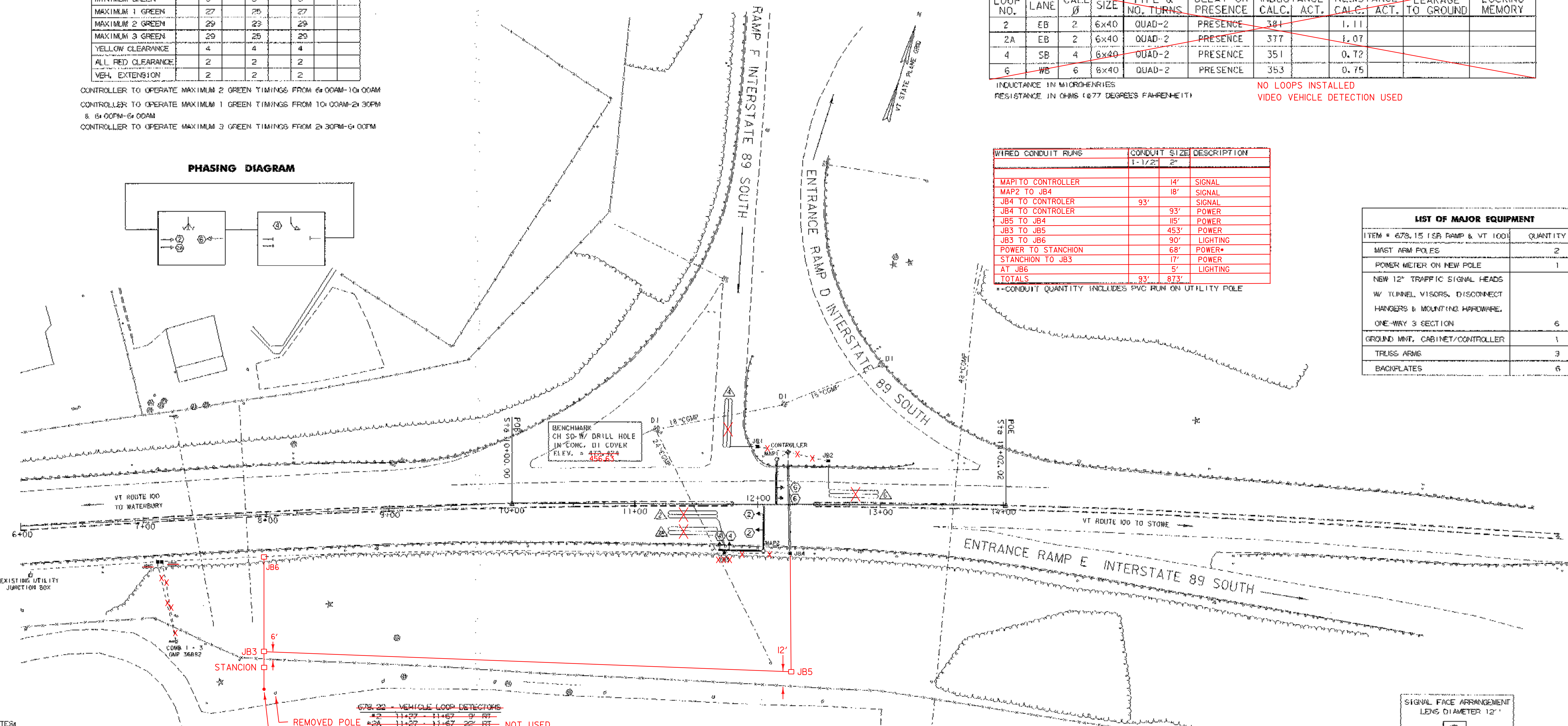
INDUCTANCE IN MICROHENRIES
 RESISTANCE IN OHMS (@77 DEGREES FAHRENHEIT)

NO LOOPS INSTALLED
 VIDEO VEHICLE DETECTION USED

WIRED CONDUIT RUNS	CONDUIT SIZE	DESCRIPTION
MAP1 TO CONTROLLER	14'	SIGNAL
MAP2 TO JB4	18'	SIGNAL
JB4 TO CONTROLLER	93'	SIGNAL
JB4 TO CONTROLLER	93'	POWER
JB5 TO JB4	115'	POWER
JB3 TO JB5	453'	POWER
JB3 TO JB6	90'	LIGHTING
POWER TO STANCHION	68'	POWER*
STANCHION TO JB3	17'	POWER
AT JB6	5'	LIGHTING
TOTALS	93'	873'

*CONDUIT QUANTITY INCLUDES PVC RUN ON UTILITY POLE

LIST OF MAJOR EQUIPMENT	
ITEM #	QUANTITY
678.15 (SB RAMP & VT 100)	
MAST ARM POLES	2
POWER METER ON NEW POLE	1
NEW 12" TRAFFIC SIGNAL HEADS W/ TUNNEL VISORS, DISCONNECT HANGERS & MOUNTING HARDWARE, ONE-WAY 3 SECTION	6
GROUND MNT. CABINET/CONTROLLER	1
TRUSS ARMS	3
BACKPLATES	6



NOTES:

- CALL DIG SAFE PRIOR TO PERFORMING ANY EXCAVATION WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM THE ACTUAL LOCATION OF THE EXISTING UNDERGROUND FACILITIES PRIOR TO EXCAVATING. ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- A NEW UTILITY POLE WILL BE INSTALLED BY GREEN MOUNTAIN POWER AT APPROX. VT 100 STA. 7+22.100' RT TO REPLACE EXIST. POLE #1 GMP 36852. A NEW STANCHION WITH METERS AND DISCONNECTS FOR THE SIGNAL AND LIGHTING WILL BE NEXT TO THIS NEW POLE. THE LIGHTING WILL BE CONNECTED AT THE EXISTING UTILITY BOX THEN TIED INTO EXISTING CONDUIT. SEPARATE CONDUIT WILL BE RUN FOR THE TRAFFIC SIGNAL POWER BACK TO THE CONTROLLER WHERE ANOTHER DISCONNECT WILL BE INSTALLED.
- TRAFFIC ITEMS LISTED ARE APPROXIMATE LOCATIONS AND MAY BE CHANGED BY THE RESIDENT ENGINEER IN THE FIELD.
- ELECTRICAL CONDUIT SLEEVE TO BE INSTALLED BY DIRECTIONAL BORING.

678.22 - VEHICLE LOOP DETECTORS			
42	11+27	11+67	9' RT
2A	11+27	11+67	22' RT
4	11+75	146'	06' LT
6	12+58	12+98	9' LT

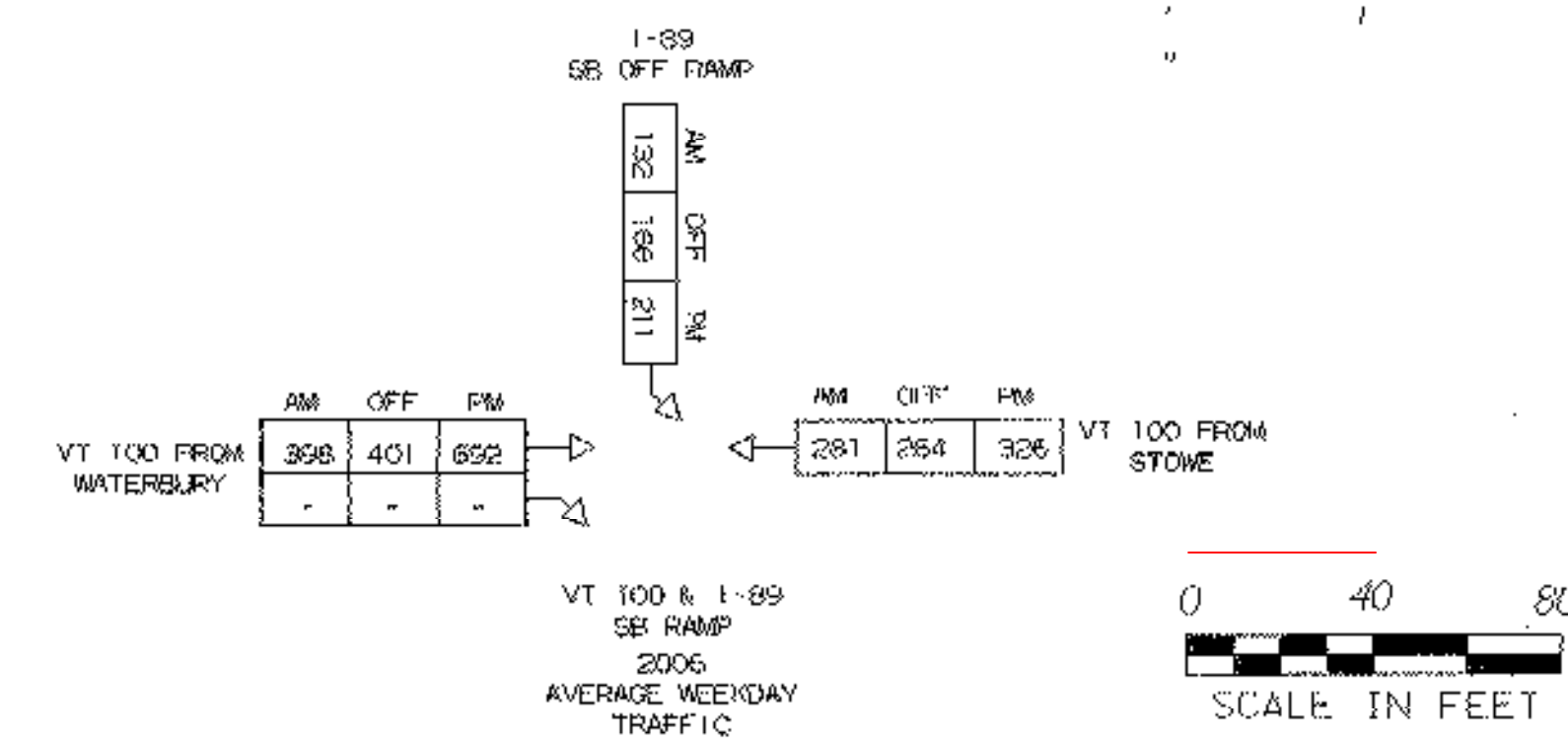
REMOVED POLE #122354
 NEW POLE #122354

678.25 - JUNCTION BOX			
JB1	12+00	47.3'	LT (SIGNAL)
JB2	12+67	25.6'	LT (SIGNAL)
JB3	11+75	29.8'	RT (SIGNAL) 109'
JB4	12+26	40.2'	RT (SIGNAL)
JB5	7+13	34.4'	RT (SIGNAL) 134'
JB6	7+10	34.4'	RT (LIGHTING) 32'

UNDER CONTRACT ITEM 678.15 MAST ARM POLES			
MAP1	12+16	36.9'	LT
MAP2	12+05	37.9'	RT

UNDER CONTRACT ITEM 678.15 CABINET / CONTROLLER			
12+25	42.6'	LT	

678.30 - ELECTRICAL CONDUIT SLEEVE (6") (PVC)
 12+26 (70 LF)



EXISTING	NEW	LEGEND
⊕	⊕	UTILITY POLE
⊕	⊕	LUMINAIRE
⊕	⊕	LIGHT OR WOOD POLE
⊕	⊕	MAST ARM POLE
⊕	⊕	CONTROLLER CABINET
⊕	⊕	JUNCTION BOX
⊕	⊕	SIGNAL HEAD
⊕	⊕	CONDUIT
⊕	⊕	VEHICLE LOOPS
⊕	⊕	STANCHION
⊕	⊕	SWEEP

TRAFFIC SIGNAL LAYOUT SHEET

PROJECT NAME: WATERBURY
 PROJECT NUMBER: NHG SGNL (27)
 FILE NAME: /traf/05b140/tb140n1.dgn
 PROJECT LEADER: B. NYQUIST
 DESIGNED BY: B. MCAVOY
 PLOT DATE: 13-NOV-2007
 DRAWN BY: B. MCAVOY
 CHECKED BY: J. SCHULTZ
 SHEET 5 OF 13

646.85 - REMOVAL OF EXISTING PAVEMENT MARKINGS

- SB RAMP - (STOP BAR)
- SB RAMP - (STOP)
- SB RAMP - (34-51' LT) (YELLOW LINE)
- SB RAMP - (STOP) (SEE NOTE 5)
- SB RAMP - (AHEAD) (SEE NOTE 5)
- SB RAMP (156-181' LT) (THRU ARROW)
- VT 100 STA. 11+02 - 11+10 RT (ONLY)
- VT 100 STA. 11+14 - 11+22 RT (RIGHT ARROW)
- VT 100 STA. 11+51 - 11+59 RT (RIGHT ARROW)
- VT 100 STA. 10+80 - 13+43 RT (SOLID LANE LINE)

621.20 - STEEL BEAM GUARDRAIL, GALVANIZED

- SB RAMP (84' LT) - VT 100 STA. 12+90 LT (150 LF)

621.50 - MANUFACTURED TERMINAL SECTION, FLARED

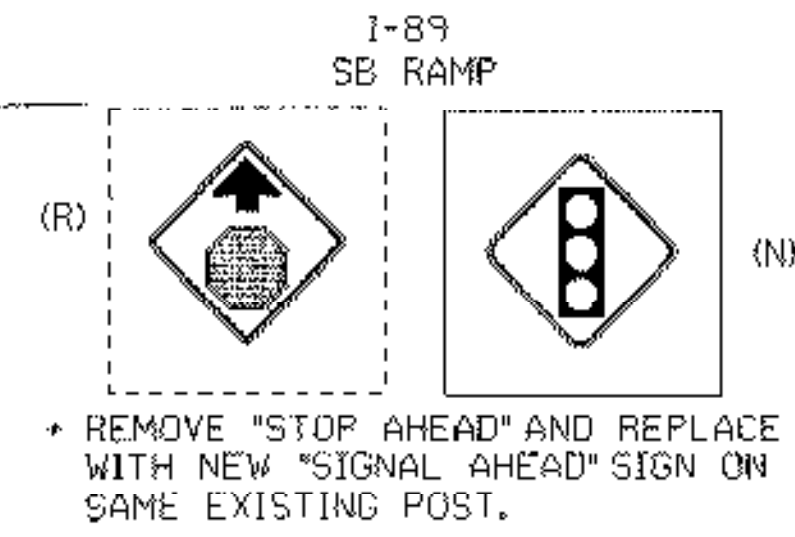
- SB RAMP - (84-121' LT)
- VT 100 STA. 12+90 - 13+27.5 LT
- 12+85 - 12+22

675.50 - REMOVING SIGNS

- SB OFF RAMP (STOP AHEAD) (SEE NOTE 4)
- VT 100 STA. 6+65 RT
- VT 100 STA. 11+55 LT (STOP)
- VT 100 STA. 12+05 LT (STOP)

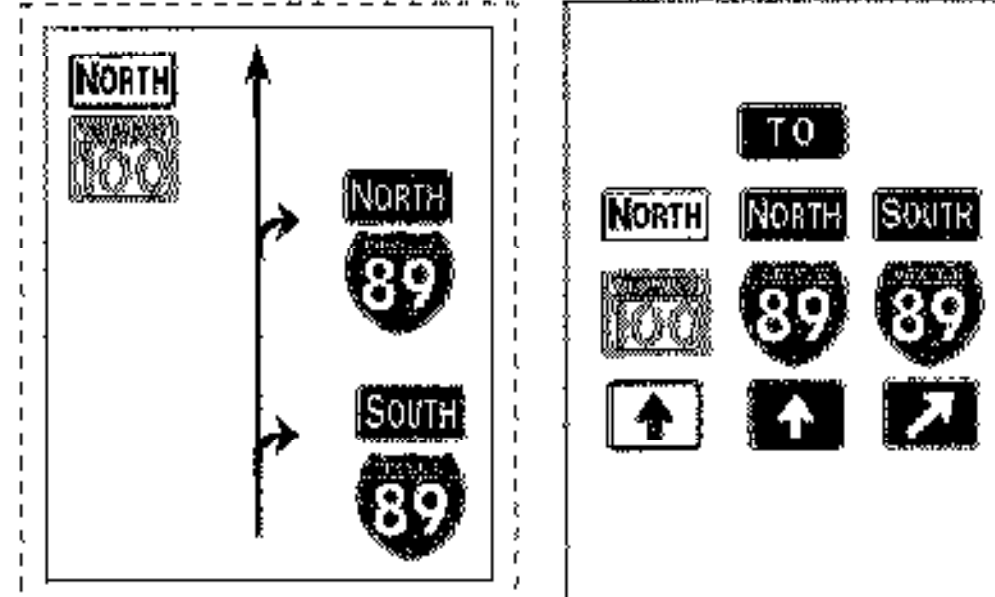
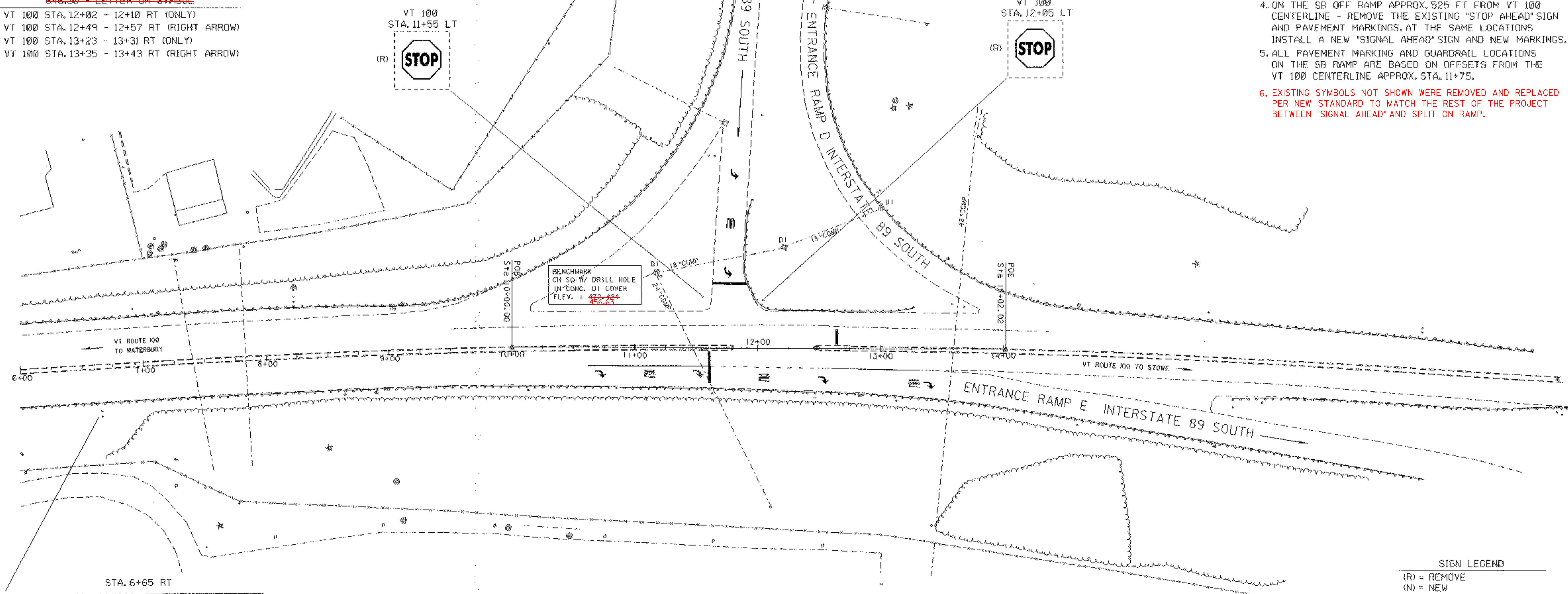
646.492 - DURABLE LETTER OF SYMBOL, THERMOPLASTIC
646.30 - LETTER OR SYMBOL

- VT 100 STA. 12+02 - 12+10 RT (ONLY)
- VT 100 STA. 12+49 - 12+57 RT (RIGHT ARROW)
- VT 100 STA. 13+23 - 13+31 RT (ONLY)
- VT 100 STA. 13+35 - 13+43 RT (RIGHT ARROW)



NOTES:

1. ALL EXISTING LANE CONFIGURATIONS TO REMAIN.
2. ALL EXISTING PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED.
3. ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED.
4. ON THE SB OFF RAMP APPROX. 525 FT FROM VT 100 CENTERLINE - REMOVE THE EXISTING "STOP AHEAD" SIGN AND PAVEMENT MARKINGS. AT THE SAME LOCATIONS INSTALL A NEW "SIGNAL AHEAD" SIGN AND NEW MARKINGS.
5. ALL PAVEMENT MARKING AND GUARDRAIL LOCATIONS ON THE SB RAMP ARE BASED ON OFFSETS FROM THE VT 100 CENTERLINE APPROX. STA. 11+75.
6. EXISTING SYMBOLS NOT SHOWN WERE REMOVED AND REPLACED PER NEW STANDARD TO MATCH THE REST OF THE PROJECT BETWEEN "SIGNAL AHEAD" AND SPLIT ON RAMP.



646.492 - DURABLE LETTER OR SYMBOL, THERMOPLASTIC

- SB RAMP (57-85' LT) (LEFT TURN ARROW)
- SB RAMP (97-105' LT) (ONLY)
- SB RAMP (137-145' LT) (LEFT TURN ARROW)
- SB RAMP (SIGNAL) (SEE NOTE 5)
- SB RAMP (AHEAD) (SEE NOTE 5)
- VT 100 STA. 10+68 - 10+76 (RIGHT ARROW)
- VT 100 STA. 11+08 - 11+16 (ONLY)
- VT 100 STA. 11+48 - 11+56 (RIGHT ARROW)
- SB RAMP (LEFT TURN ARROW) (SEE NOTE 6)
- SB RAMP (ONLY'S) (SEE NOTE 6)
- SB RAMP (RIGHT TURN ARROW) (SEE NOTE 6)

646.482 - DURABLE 24" STOP BAR, THERMOPLASTIC

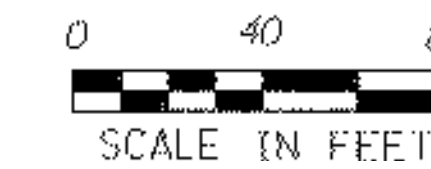
- VT 100 STA. 11+61 RT (26 FT)
- VT 100 STA. 11+63 - 11+91 (52' LT) (28 FT)
- VT 100 STA. 12+65 LT (12 FT)

646.402 - DURABLE 4" WHITE LINE, THERMOPLASTIC

- VT 100 STA. 10+60 - 11+60 (SOLID LANE LINE)
- VT 100 STA. 11+62 - 12+50 (DASHED LANE LINE) (WITH 3' DASH AND 6' GAP)
- VT 100 STA. 12+50 - 13+43 (SOLID LANE LINE)

SIGN LEGEND

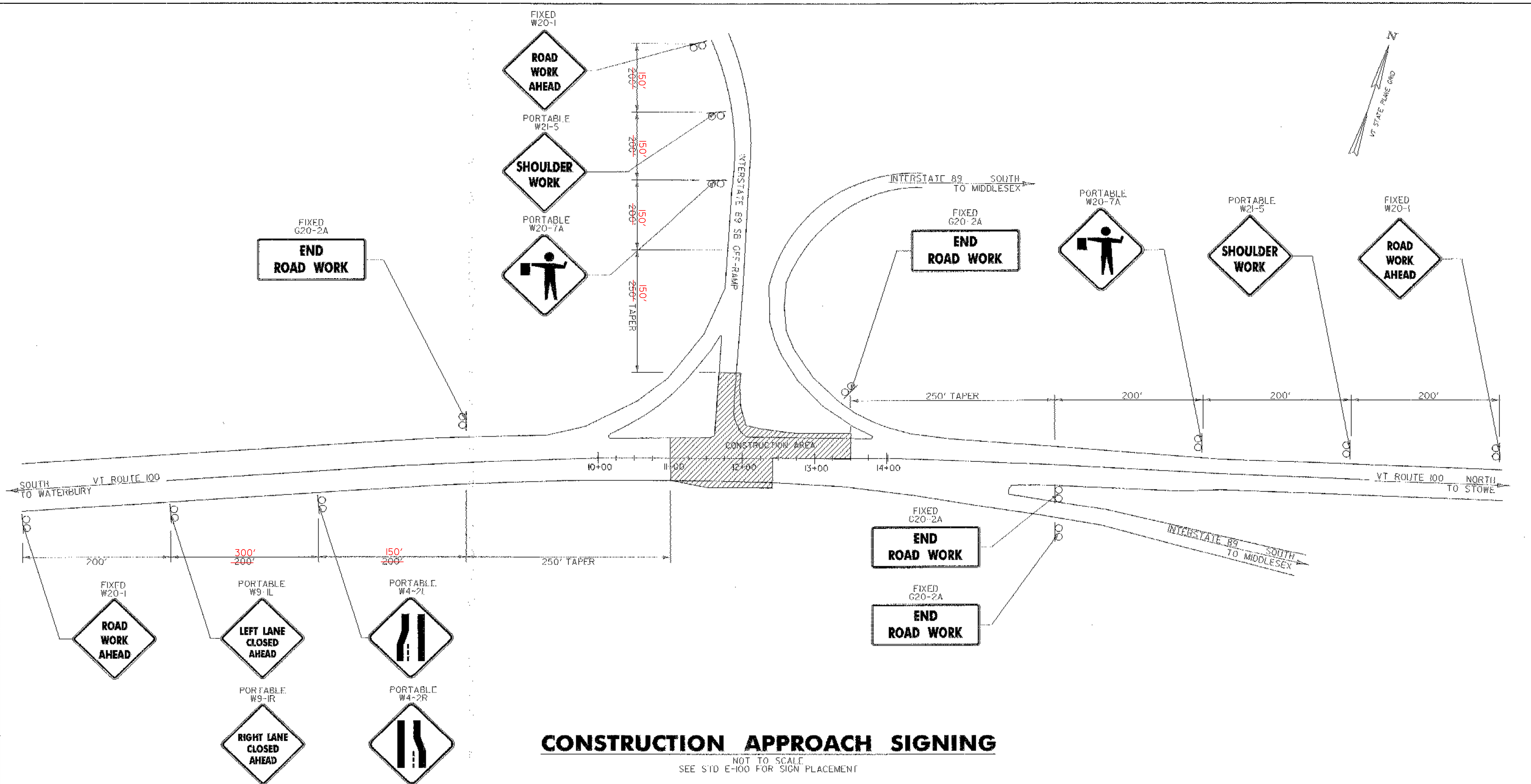
- (R) = REMOVE
- (N) = NEW
- (S) = SALVAGE
- (R&S) = REMOVE & SALVAGE
- (RET) = RETAIN
- EXISTING = - - - - -
- NEW = _____



TRAFFIC SIGNS AND PAVEMENT MARKINGS SHEET

PROJECT NAME:	WATERBURY	
PROJECT NUMBER:	NHG SGNL (27)	
FILE NAME:	/traf/05bl40/tbl40nul.dgn	PLOT DATE: 13-NOV-2007
PROJECT LEADER:	B. NYQUIST	DRAWN BY: B. MCAVOY
DESIGNED BY:	B. MCAVOY	CHECKED BY: J. SCHULTZ
	tbl40spm.j	SHEET 6 OF 13

* REMOVE EXISTING "TYPE B" SIGN AND REPLACE WITH NEW DESTINATION SIGN ASSEMBLY ON EXISTING POSTS.



CONSTRUCTION APPROACH SIGNING

NOT TO SCALE
SEE STD E-100 FOR SIGN PLACEMENT

TRAFFIC CONTROL GENERAL NOTES

1. NO CONSTRUCTION SIGNS SHALL BE INSTALLED AS TO INTERFERE OR OBSTRUCT THE VIEW OF EXISTING TRAFFIC DEVICES AND STOPPING SIGHT DISTANCE.
2. THIS TEMPORARY TRAFFIC CONTROL PLAN COVERS WORK ASSOCIATED WITH THE INSTALLATION OF THE TRAFFIC SIGNAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A SEPARATE TEMPORARY TRAFFIC CONTROL PLAN FOR ALL OTHER WORK. ALL WORK AND EQUIPMENT ASSOCIATED WITH THIS TEMPORARY TRAFFIC CONTROL PLANS SHALL BE PAID FOR UNDER ITEM 641.10 - TRAFFIC CONTROL.
3. SEE TYPICAL APPLICATIONS 23 & 42 IN THE MUTCD FOR GENERAL GUIDANCE.
4. FOR ADDITIONAL INFORMATION, SEE VT STDS E-100, E-100A, E-101, E-102, F-106, E-107, E-107A, E-110, E-123

TRAFFIC CONTROL SHEET

PROJECT NAME:	WATERBURY		
PROJECT NUMBER:	NHG SGNL (27)		
FILE NAME:	/trdf/05b140/tb140tc.dgn	PLOT DATE:	13-NOV-2007
PROJECT LEADER:	J. SCHULTZ	DRAWN BY:	D. LYMAN
DESIGNED BY:	B. MCAVOY	CHECKED BY:	J. SCHULTZ
	tc140tc.t	SHEET	8 OF 13

TRAFFIC SIGNAL NOTES

A. NEW SIGNAL EQUIPMENT

1. ALL SIGNAL HEADS SHALL HAVE POLYCARBONATE SECTIONS AND LENSES. THE SIGNAL HEADS SHALL HAVE FLAT BLACK HOUSINGS AND VISORS.
2. ALL SIGNAL HEADS SHALL HAVE BLACK LOUVERED BACK PLATES.
3. THE TRAFFIC SIGNAL CONTROLLER AND RELATED EQUIPMENT SHALL BE MANUFACTURED BY ECONOLITE CONTROL PRODUCTS, INC. THE SYSTEM CONTROLLER SHALL BE AN ASC/2S-2100 (TS-2, TYPE 2) IN CABINET P44 WITH BASE EXTENSION INSTALLED AT THE LOCATION SHOWN ON SHEET 5.
4. ALL SIGNAL HEADS SHALL HAVE RED, YELLOW AND GREEN LED SIGNALS WITH A VISIBLE BEAM SPREAD OF 80 DEGREES OFF AXIS.

B. SIGNAL OPERATION

1. SWITCH-OVER TO NEW SIGNAL SYSTEM SHALL NOT BE DONE DURING PEAK TRAFFIC PERIODS. UNIFORMED TRAFFIC OFFICERS SHALL CONTROL TRAFFIC DURING SWITCH-OVER.
2. ALL SIGNALS SHALL DWELL ON THE VT 100 THRU MOVEMENT.
3. THE VT 100 THRU PHASE SHALL BE USED FOR THE START-UP PHASE FOLLOWING FLASHING OPERATION.
4. SIGNAL TIMING SHOWN ON THE PLANS MAY REQUIRE FINE-TUNING IN THE FIELD BASED ON TRAFFIC OBSERVATION AND/OR ADDITIONAL FIELD STUDIES.

C. PULLBOXES AND JUNCTION BOXES

1. PULLBOXES AND JUNCTION BOXES ARE DETAILED ON STANDARD E-173. MINIMUM JUNCTION BOX SIZE SHALL BE 18" X 12" X 12", OR LARGER AS REQUIRED BY THE ELECTRICAL CODE.
2. THE LOGO ON PULLBOXES / JUNCTION BOXES SHALL BE "TRAFFIC SIGNALS" EXCEPT JB 6 SHALL BE "STREET LIGHTING".

D. TRAFFIC SIGNAL CONDUIT

1. ALL TRAFFIC SIGNAL CONDUIT SHALL BE PVC. ALL EXPOSED CONDUIT SHALL BE SCHEDULE 80, PVC.

E. VEHICLE DETECTOR LOOPS

- ~~1. SEE STANDARD E-172 REPLACED BY VIDEO VEHICLE DETECTION~~
- ~~2. LOOPS SHALL BE CUT INTO THE EXISTING PAVEMENT.~~

F. STREET LIGHTING

1. EXISTING TO REMAIN.

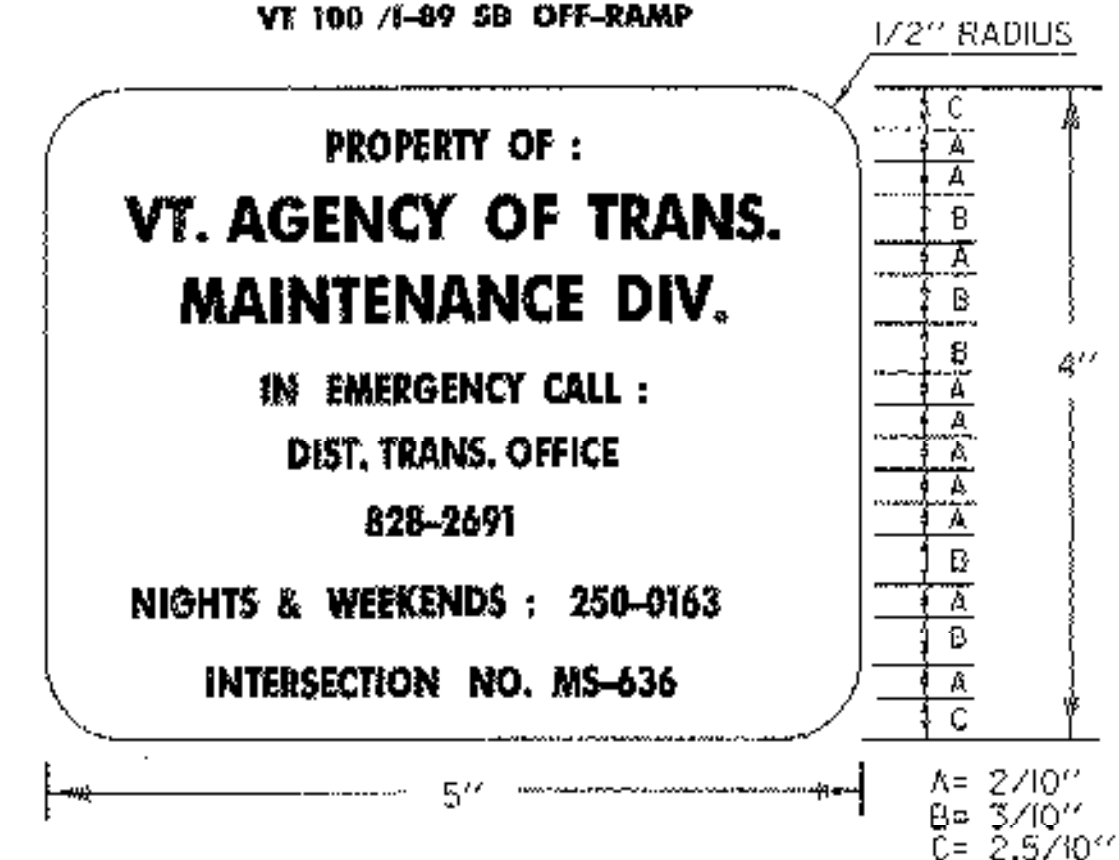
G. MAST ARM FOUNDATIONS

1. SEE THE SPECIAL PROVISIONS FOR THE GEOTECHNICAL ANALYSIS AND RECOMMENDED FOUNDATION DESIGN.

H. GENERAL

1. A UNIFORMED TRAFFIC OFFICER SHALL DIRECT TRAFFIC WHEN ONE-WAY TRAFFIC EXISTS ON ANY APPROACH.
2. 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 SIGNAL AND STREET LIGHTING 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. NO INTERVENING OWNERSHIP/ RESPONSIBILITY SHALL BE ALLOWED.
3. THE CONTRACTOR SHALL RETURN ANY SALVAGED SIGNS TO THE VTRANS TRAFFIC SHOP IN BERLIN PRIOR TO PROJECT COMPLETION. COORDINATE THROUGH RUSS VELANDER AT 802-828-3535.

**CONTROLLER IDENTIFICATION PLAQUE
VT 100 / I-89 SB OFF-RAMP**



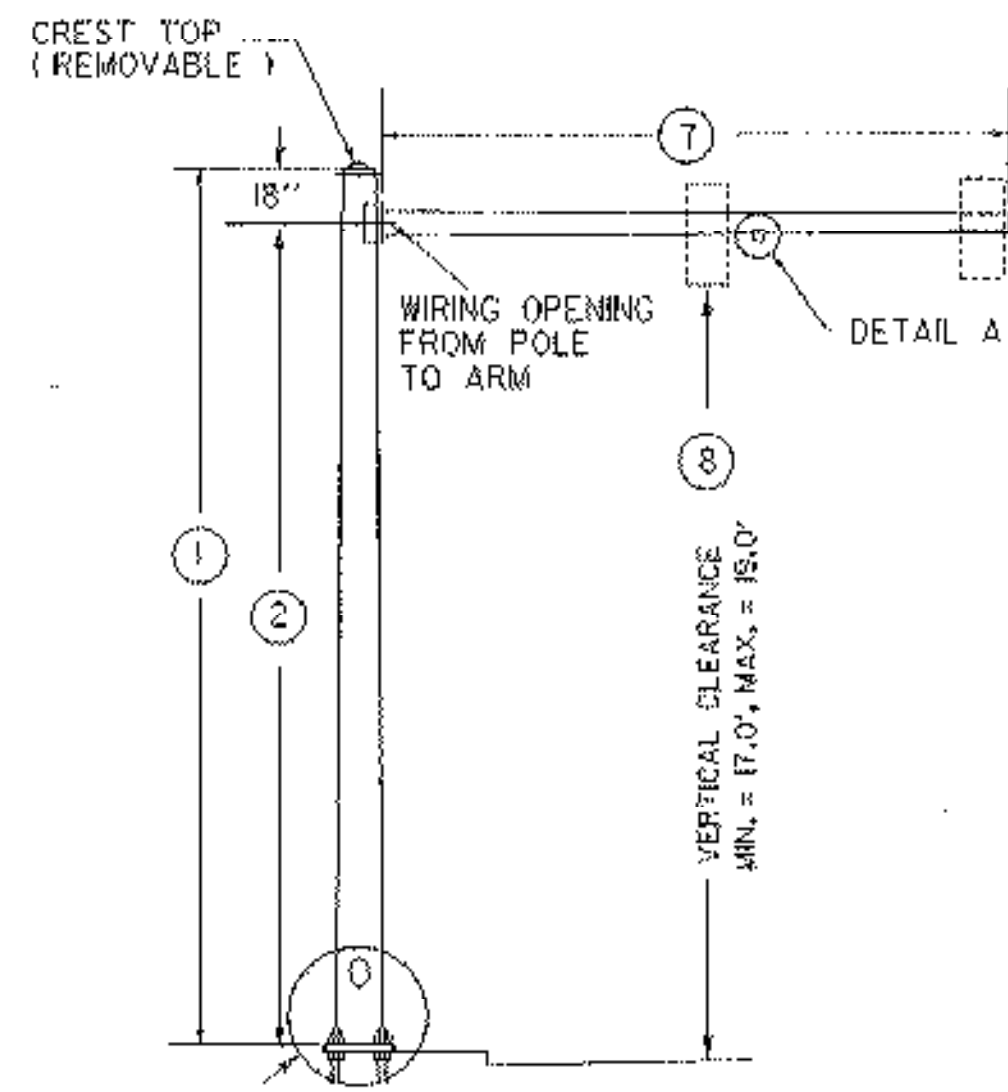
LEGEND: - BLACK (NON-REFL.) - STAMPED PRIOR TO PAINTING
BACKGROUND: NATURAL ALUMINUM OR BRASS SURFACE

NOTES:

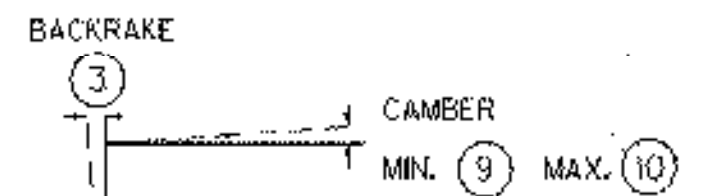
- 1.) THE PLAQUE SHALL BE MOUNTED ON ALL TRAFFIC SIGNAL CONTROLLER CABINETS. IT SHALL BE FASTENED TO THE CONTROLLER CABINET IN SUCH A MANNER AS TO BE NOT EASILY REMOVED, SUCH AS WELDED, RIVETED OR BOLTED WITH VANDAL PROOF BOLTS.
- 2.) THE LETTERS SHALL BE PUNCHED OR STAMPED. SUCH STAMPING SHALL PENETRATE AT LEAST 1/2 THE BASE MATERIAL THICKNESS.
- 3.) THE BASE MATERIAL FOR THE PLAQUE SHALL BE BRASS OR ALUMINUM WITH A MINIMUM THICKNESS OF 0.100 INCHES.

TRAFFIC SIGNAL NOTES

PROJECT: WATERBURY	PROJECT NO.: NHG SGNL(27)
DESIGN FILE NAME: /trac/05b140/tb140nul.dgn IPARM FILE NAME: tb140not.i SURVEYED BY: SQUAD LEADER: J. SCHULTZ	PLOT DATE: 13-NOV-2007 SURVEY DATE: DRAWN BY: B. MCAVOY SHEET: 9 OF 13

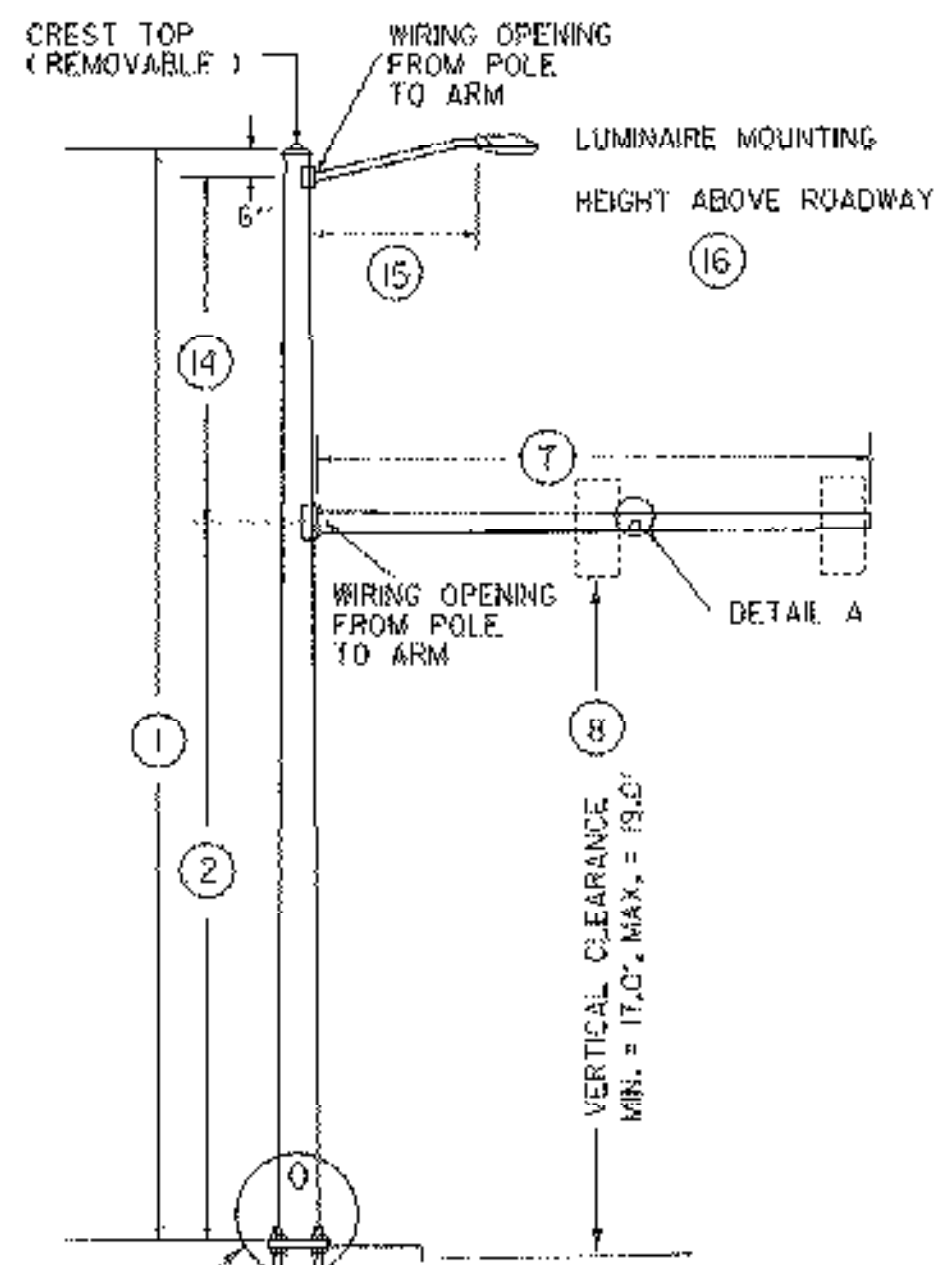


TYPE A

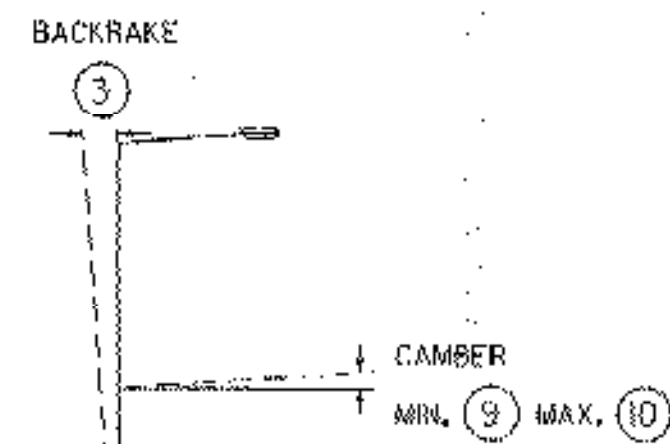


CAMBER AND BACKRAKE DATA
MIN. CAMBER = PERMANENT
LOAD DEFLECTION
CAMBER OF 3% PLUS DEAD

- POLE BASE DIAMETER (4)
- POLE GAUGE (5)
- POLE TAPER RATE (6)
- ARM DIAMETER (11)
- ARM GAUGE (12)
- ARM TAPER RATE (13)



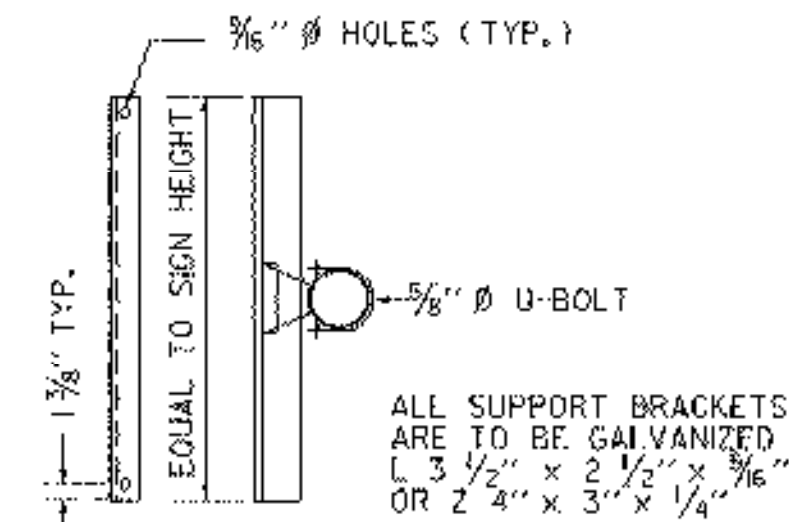
TYPE B



CAMBER AND BACKRAKE DATA
MIN. CAMBER = PERMANENT
LOAD DEFLECTION
CAMBER OF 3% PLUS DEAD

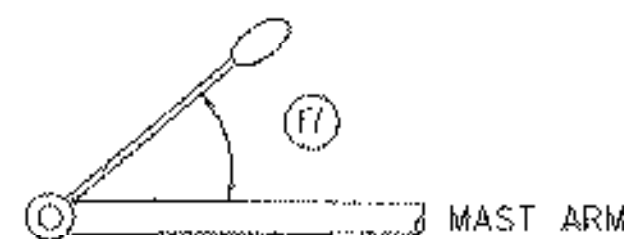


DETAIL A

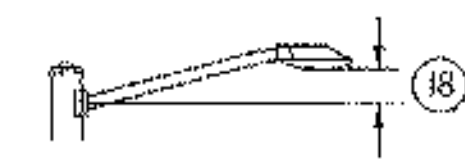


SIGN ON SINGLE
MAST ARM

SIGN BRACKET DETAILS

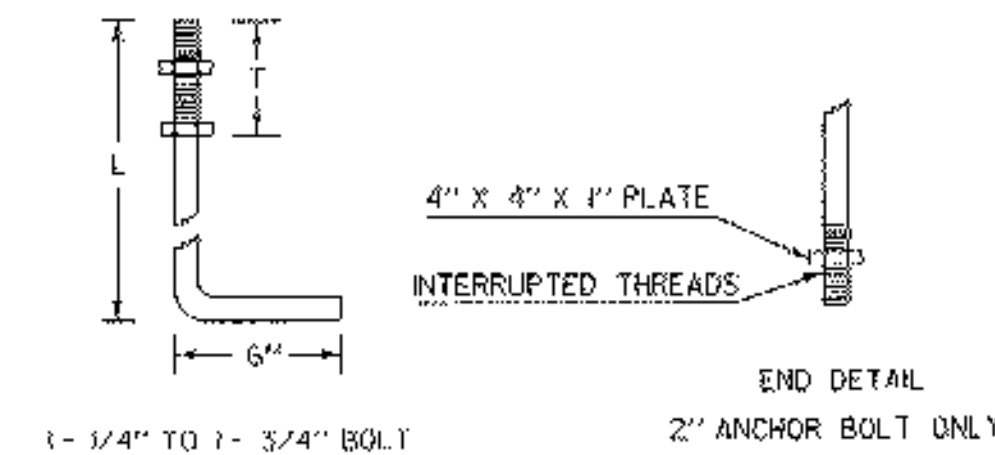


LUMINAIRE ORIENTATION

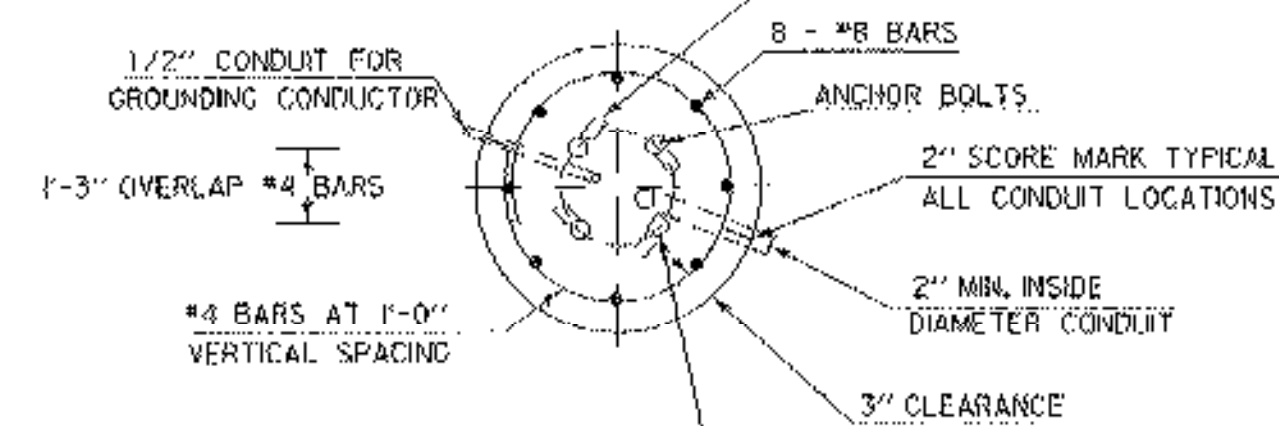


LUMINAIRE ARM RISE

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 80"	84	9
2" X 96"	96	9



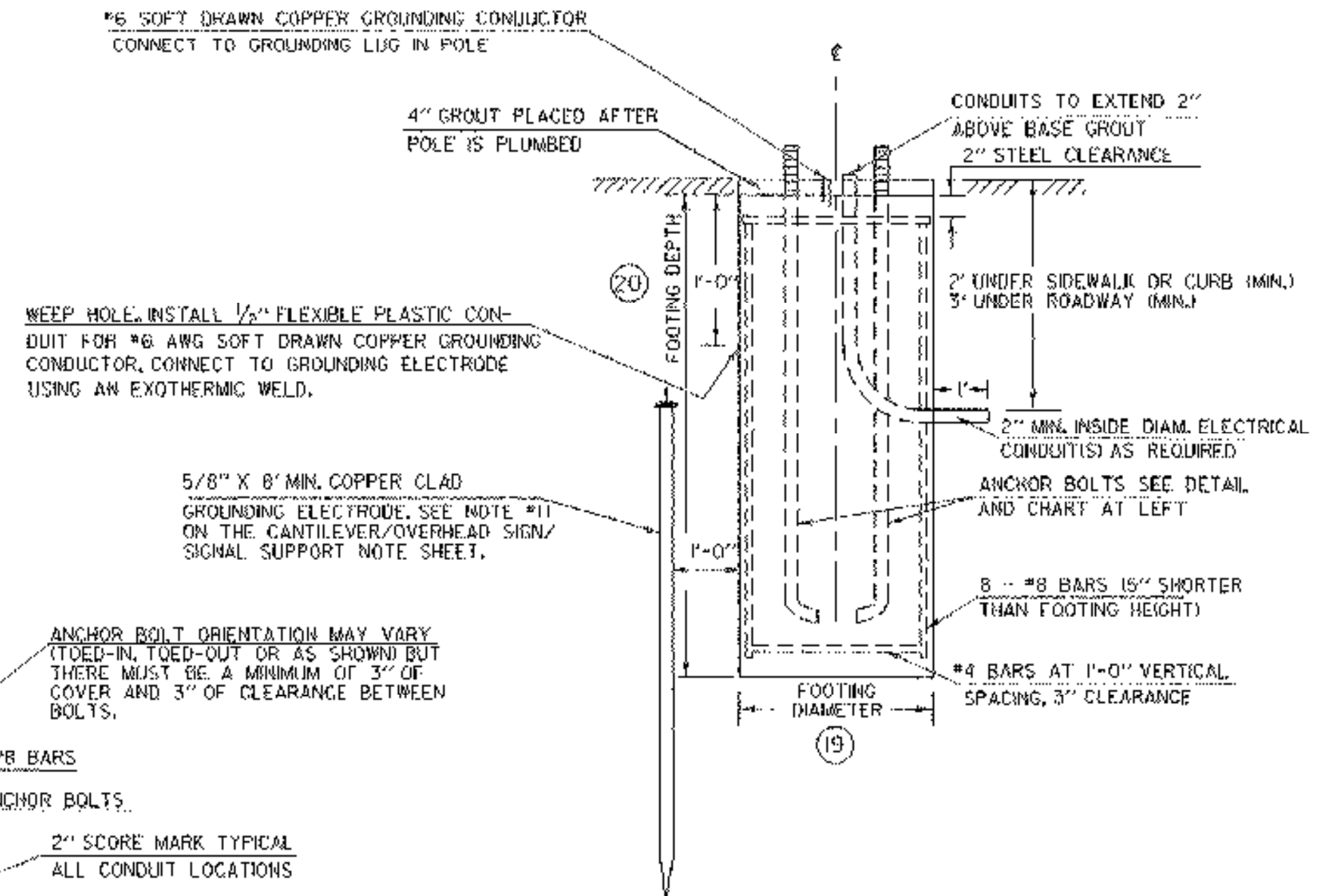
ANCHOR BOLT DETAIL



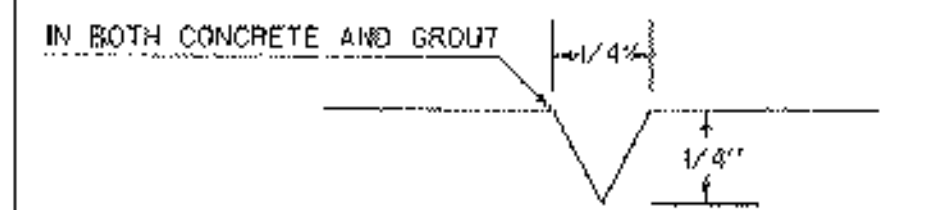
SECTION

CANTILEVER FOOTING DETAIL

(SPREAD FOOTINGS OR PILES ARE OPTIONAL)

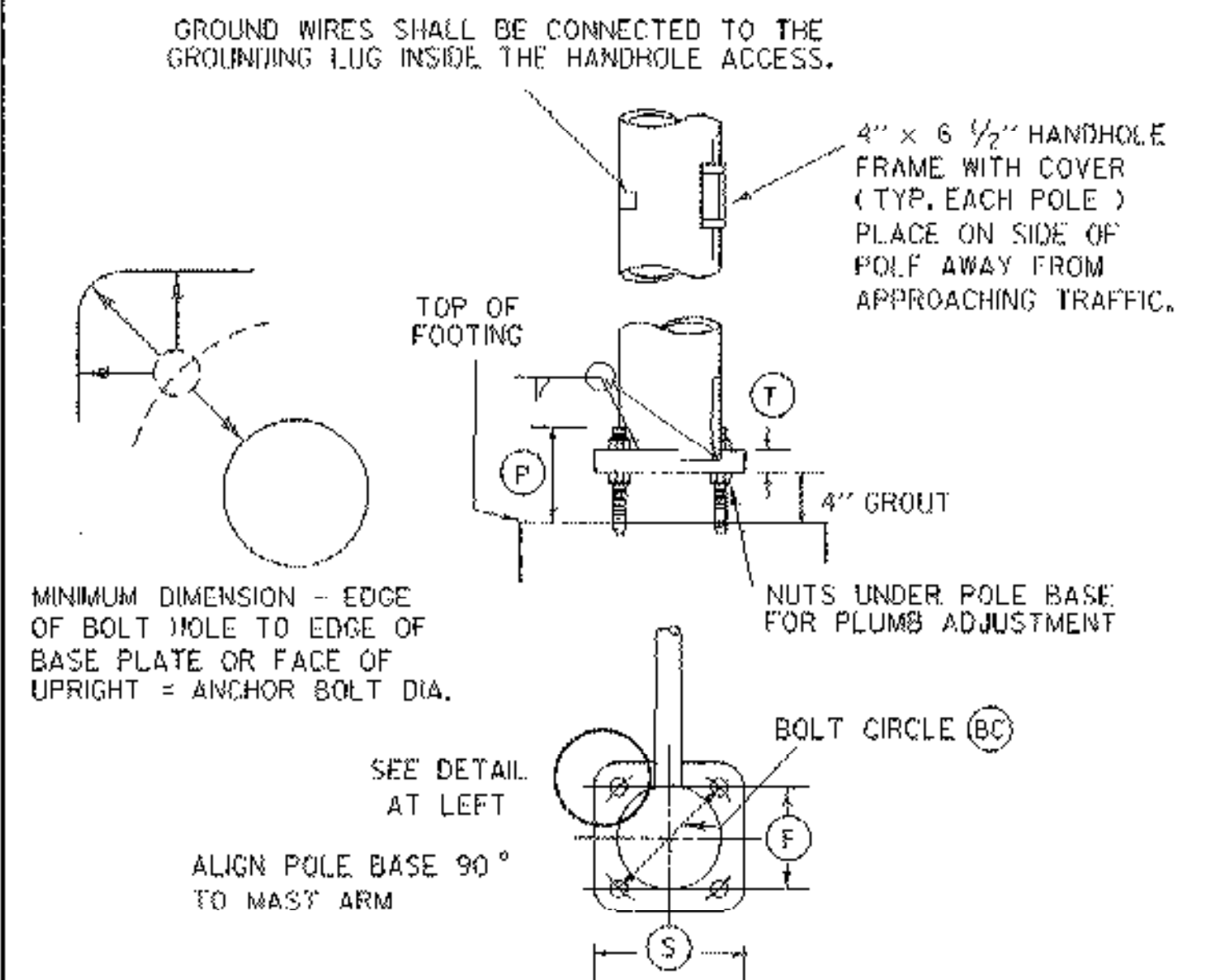


ELEVATION



USED FOR CONDUIT LOCATION, SEE SECTION
DETAIL AT LEFT

2" SCORE MARK DETAIL



POLE BASE AND BASE PLATE DETAIL

STRUCTURE DIMENSIONS																												
POLE	TYPE	POLE DATA						ARM DATA						LIGHTING 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	BC	F	S	T	P	ANCHOR BOLT SIZE	
MAP1	A	21'	20'		11"	7		35'	18'-6"	3"		9"	7							3'	3'-6"	15"		16.5"	1.5"		1 1/4" X 48"	
MAP2	A	21'	20'		12"	7		35'	18'-1"	3"		9"	7							3'	3'-6"	16"		17"	1.5"		1 1/4" X 48"	

NOTE:
DETAILS
NTS

SINGLE MAST ARM CANTILEVER WITH LIGHTING / FOOTING DETAIL SHEET

/traf/05b140/tb140nuf.dgn
/traf/05b140/tb140fds.i

PREPARED BY E. MCAVOY DATE _____
CHECKED BY _____ DATE _____
DESIGN SUPERVISOR JLS DATE _____
PROJ. _____

PLOYTFD:13-NOV 2007

LAST REVISED 8/15/95

**WATERBURY
NHG SGNL (27)**

SHEET 10 OF 13 SHEETS

GENERAL NOTES SHEET

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR CONSTRUCTION", DATED 2006, WITH CURRENT MODIFICATIONS.

2. OVERHEAD SIGN/SIGNAL SUPPORTS SHALL CONFORM TO AASHTO'S PUBLICATION ENTITLED "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", DATED 2001 OR ITS LATEST REVISION.

3. ADDITIONAL DESIGN CRITERIA ARE AS FOLLOWS:

CONCRETE $f_c = 1400$ PSI $f'_c = 3500$ PSI
 REINFORCING $f_s = 24000$ PSI (GRADE 60)
 FOOTING SOIL PRESSURE : 3000 PSF (MAXIMUM)

WIND LOAD (BASED ON PEAK 3-SECOND GUSTS) AND ICE LOAD PER 2001 AASHTO "STANDARD SPECIFICATIONS"

2001 AASHTO SPECIFICATIONS	
CATEGORY 1	
CATEGORY 2	X
CATEGORY 3	
GALLOPING	
VORTEX SHEDDING	X
NATURAL WIND GUST	X
TRUCK INDUCED GUSTS	X

(X) DENOTES CATEGORIES TO BE USED

4. ANCHOR BOLTS

FOUR STAINLESS STEEL ANCHOR BOLTS WITH TWO HEXAGON NUTS, ONE WASHER AND ONE LOCK WASHER PER BOLT SHALL BE FURNISHED WITH EACH POLE. ANCHOR BOLT PLATES, WHEN USED, SHALL ALSO BE STAINLESS STEEL. SEE SUB-SECTION 714.09.

5. FLANGE BOLTS

ALL FLANGE BOLTS AND HEX NUTS SHALL BE HIGH STRENGTH STEEL AND SHALL CONFORM TO AASHTO M 164, TYPE I, GALVANIZED IN ACCORDANCE WITH AASHTO M 232M/M 232. 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 48,000 PSI. 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.

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 AASHTO M 111M/M111 AND M232M/M232.

8. WELDING

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

9. FOOTINGS

- A. FOOTINGS SHALL BE DESIGNED TO RESIST LOADS EQUAL TO, OR GREATER THAN, THE MAXIMUM LOADS THAT THE POLE IS DESIGNED FOR.
- B. THREE TYPES OF FOUNDATIONS, AS OUTLINED IN AASHTO STANDARD SPECIFICATIONS SECTION 13 (SEE NOTE 2) SHALL BE ALLOWED.

- 1. DRILLED SHAFTS
- 2. SPREAD FOOTINGS
- 3. PILES.

C. DRILLED SHAFT FOOTINGS SHALL BE POURED IN DRILLED SHAFTS AGAINST UNDISTURBED MATERIAL. THE TOP TWO FEET OF SOIL SHALL BE NEGLECTED FOR DESIGN PURPOSES. THE MAXIMUM FOOTING DIAMETER SHALL BE THREE FEET AND THE MAXIMUM DEPTH SHALL BE TWELVE FEET. IF THESE LIMITS ARE EXCEEDED OR IF THE SOIL IS NOT CAPABLE OF A BEARING PRESSURE OF 3000 PSF, A SPREAD FOOTING SHALL BE USED.

D. 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 FOOTING SIDES AND ONE FOOT DEEPER THAN THE FOOTING. CARE SHALL BE TAKEN TO AVOID EXCAVATING AROUND THE TOP OF THE FOOTING. THE BACKFILL MATERIAL SHALL BE COMPACTED AS DESCRIBED IN SUB-SECTION 204.08. DESIGN LIMITS AS FOR AUGERED FOOTING APPLY.

E. WHEN THE DESIGN DEPTH OF A FOOTING CANNOT BE OBTAINED DUE TO UNFORSEEN FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND OBTAIN A REVISED FOOTING DETAIL FROM THE ENGINEER.

F. ANY BACKFILL PLACED ADJACENT TO THE FOOTING SHALL BE GRANULAR MATERIAL MEETING THE REQUIREMENTS FOR GRANULAR BACKFILL FOR STRUCTURES, SUB-SECTION 704.08. CONCRETE FOR FOOTING SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE, CLASS B, SECTION 541, STRUCTURAL CONCRETE. GROUT MATERIAL SHALL BE NON-SHRINKING MORTAR CONFORMING TO SUB-SECTION 707.03 (MORTAR TYPE IV).

G. SIGNALS/SIGNS SHALL BE INSTALLED AND LEVELED AND POLES SHALL BE PLUMB PRIOR TO PLACING GROUT UNDER POLE BASE.

10. SHOP DRAWINGS (6 COPIES OF EACH) SHALL BE SUBMITTED TO THE STATE OF VERMONT, AGENCY OF TRANSPORTATION, IN ACCORDANCE WITH SUBSECTION 105.03. THE SHOP 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 SHOP DRAWINGS. (SEE SUB-SECTION 506.10)

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

- 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' (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 GROUNDING ELECTRODE CONDUCTOR 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 GROUNDING ELECTRODE CONDUCTOR FROM THE POLE GROUNDING LUG, CONTROLLER CABINET AND/OR LUMINAIRE MAY ATTACH TO THIS CONTINUOUS GROUNDING ELECTRODE CONDUCTOR FROM THE SERVICE METER AND DISCONNECT. THE CONTRACTOR SHALL PERFORM A RESISTANCE TO GROUND TEST ON THE CONTINUOUS GROUNDING 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.

12. THE COST OF SIGNAL/SIGN SUPPORTS, INCLUDING ALL HARDWARE, SIGN BRACKETS, FOOTINGS AND LUMINAIRE ARMS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 677.12, 677.13 OR 678.15, WHICHEVER IS APPLICABLE. THESE COMPONENTS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF SECTIONS 677, 678, AND 679.

13. 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.

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

15. THE DETAILS OF DESIGN FOR THE STRUCTURE AND FOOTINGS 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 DETAILS OF THE STRUCTURE AND THE FOOTING SHALL BE CHECKED AND STAMPED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF VERMONT PRIOR TO SUBMITTAL OF THE SHOP DRAWINGS TO THE VERMONT AGENCY OF TRANSPORTATION.

16. IN ADDITION TO THE SHOP DRAWINGS OUTLINED IN NOTE 10 THE CONTRACTOR SHALL SUBMIT ALL DESIGN CALCULATIONS SHOWING THE FOLLOWING INFORMATION FOR EACH OF THE VERTICAL AND HORIZONTAL COMPONENTS OF THE STRUCTURE AND FOOTING:

- A. THE DESIGN AXIAL AND SHEAR FORCES AND BENDING AND TORSIONAL MOMENTS.
- 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,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 3.
- F. FAILURE TO SUPPLY THE PROPER DESIGN INFORMATION SHALL BE CAUSE FOR REJECTION OF THE STRUCTURE.
- G. A MINIMUM OF FOUR (4) WEEKS SHALL BE REQUIRED FOR REVIEW BY THE VERMONT AGENCY OF TRANSPORTATION.

17. THE CONTRACTOR/MANUFACTURER SHALL BE RESPONSIBLE FOR COMPLETION OF THE STRUCTURE AND FOOTING DATA ON THE DETAIL SHEET(S).

18. FOR INSTALLATIONS WHERE BOTH "EXISTING" AND "FUTURE" CONDITIONS ARE SHOWN, THE SUPPORTS SHALL BE DESIGNED FOR THE MORE SEVERE OF THE TWO LOADING CONDITIONS. THE INFORMATION OUTLINED IN NOTE 16 ABOVE SHALL BE PROVIDED FOR BOTH THE LOADING CONDITIONS.

19. THE TRAFFIC SIGNALS SHALL BE MOUNTED TO THE ARM OR POLE USING A FIXED MOUNT SYSTEM AS SHOWN ON THE MAST ARM CROSS SECTION SHEET.

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

21. THIS PROJECT WILL DISTURB AN ESTIMATED 0.013 ACRES OF LAND INCLUDING BOTH ON-SITE AND CONTIGUOUS WASTE, BORROW, STAGING, AND HAUL ROADS. SHOULD THE AREA OF DISTURBANCE CHANGE AND RESULT IN 1 OR MORE ACRES OF EARTH DISTURBANCE, OR SHOULD THE PROJECT BECOME PART OF A COMMON PLAN OF DEVELOPMENT, THEN THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL PERMITTING WITH THE AGENCY OF NATURAL RESOURCES.

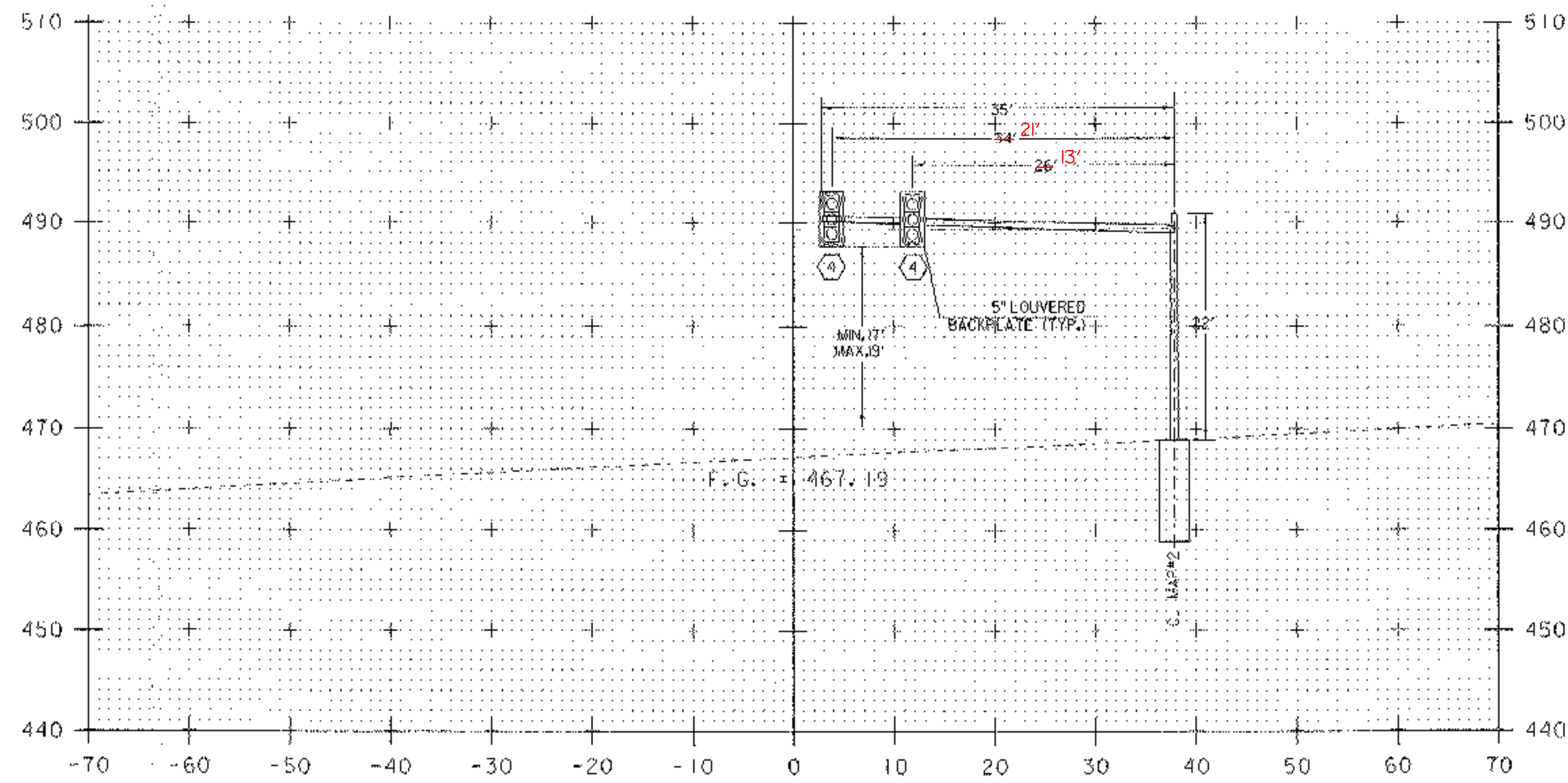
LAST REVISED 8/23/94

PREPARED BY B. MCAVOY DATE _____
 CHECKED BY _____ DATE _____
 DESIGN SUPERVISOR JLS DATE _____
 PROJ. _____

**WATERBURY
NHG SGNL (27)**

SHEET II OF 13 SHEETS

MAST ARM #3
 LOOKING SOUTH ON
 I-89 SB EXIT RAMP

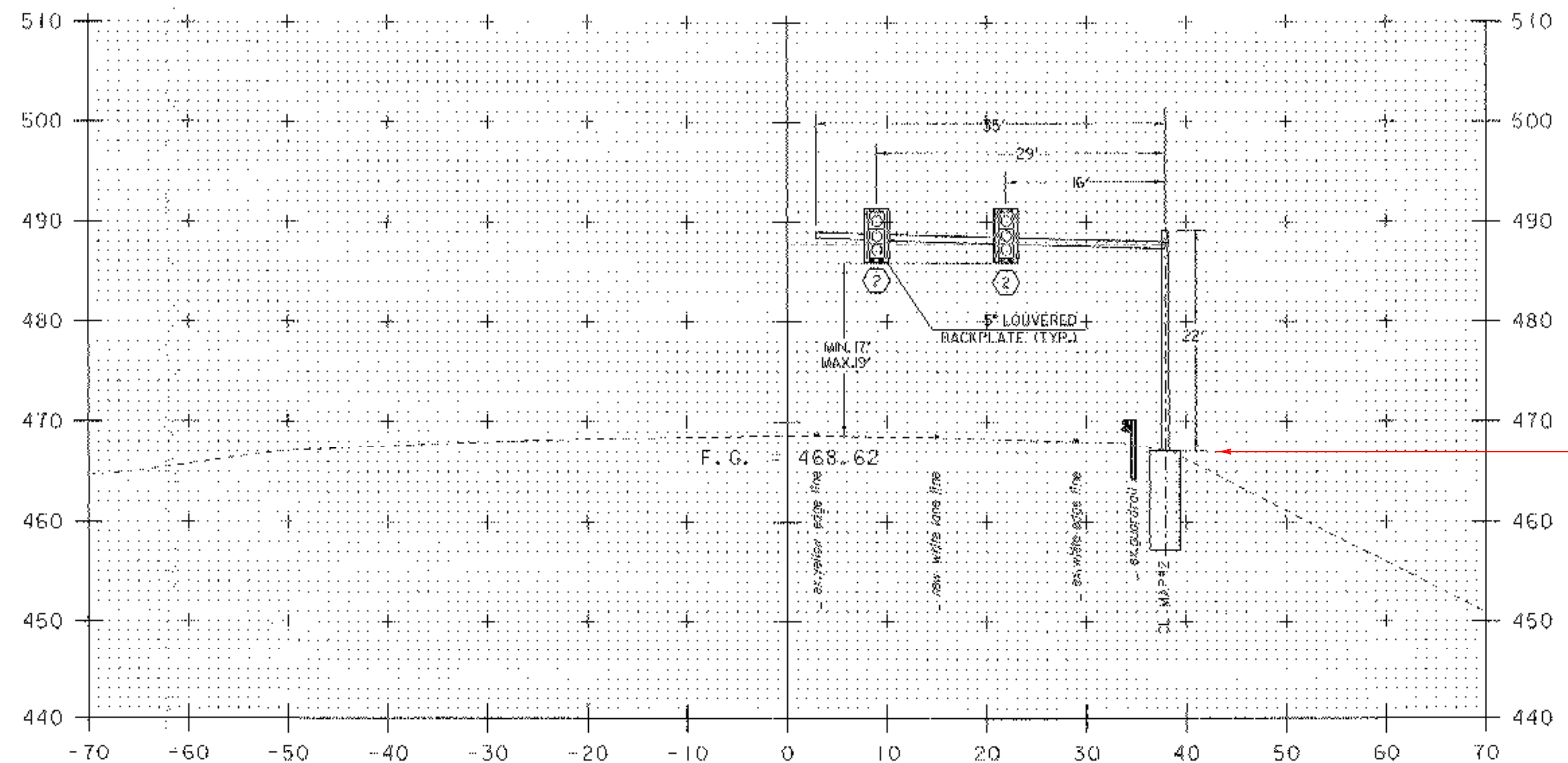


• ARM SHOULD BE ON RIGHT
 SIDE OF POLE

12+05

NOTE: THE FOUNDATION DEPTHS
 ARE NOT TO SCALE (TYP).

MAST ARM #2
 LOOKING EAST ON
 VT 100



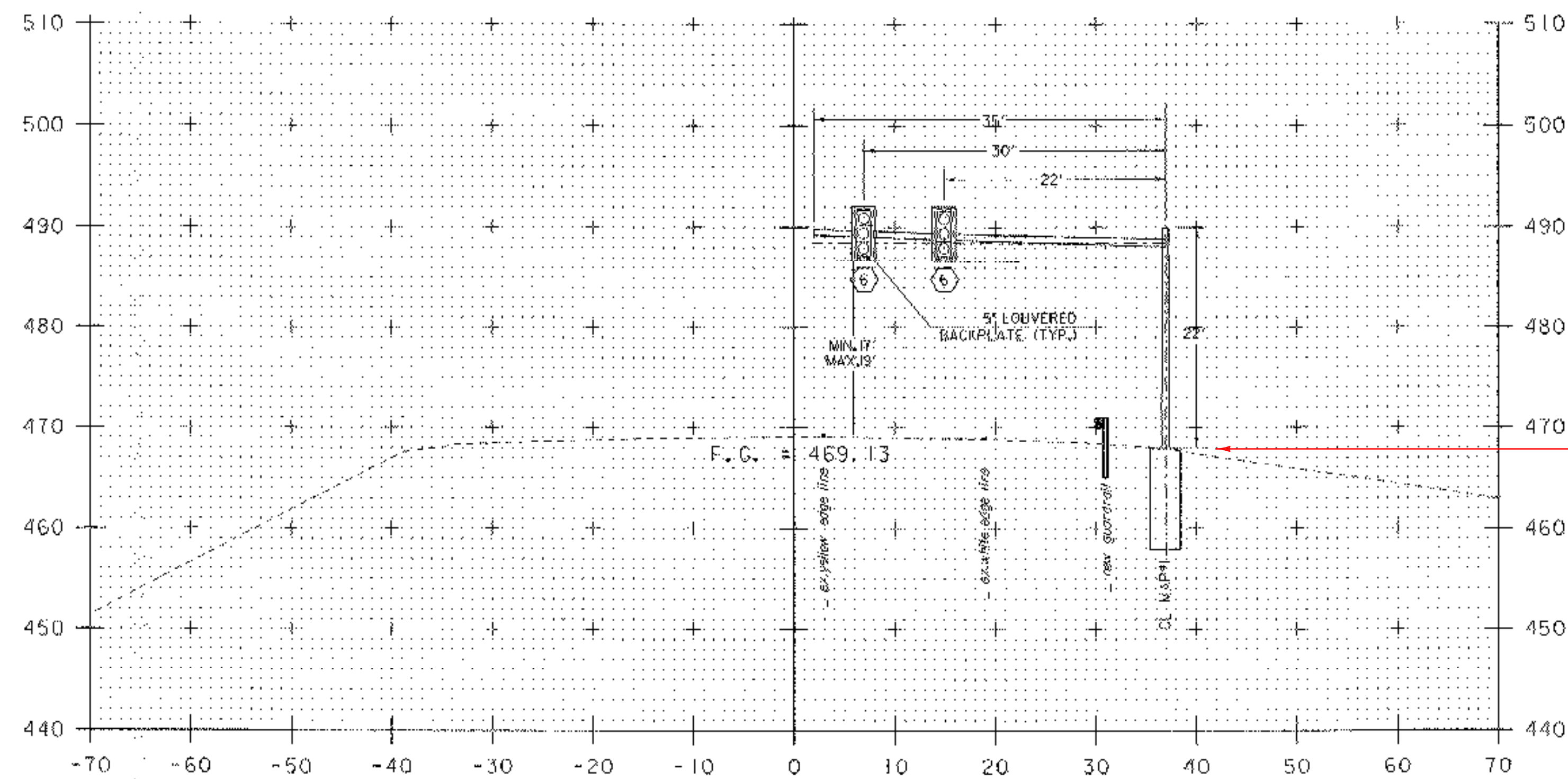
467.685 THEORETICAL
 467.98 ACTUAL

12+05

MAST ARM CROSS SECTION SHEET 1

PROJECT NAME:	WATERBURY		
PROJECT NUMBER:	NHG SGNL(27)		
FILE NAME:	traf/05bl40/tbl40wrk.dgn	PLOT DATE:	13-NOV-2007
PROJECT LEADER:	J. SCHULTZ	DRAWN BY:	B. MCAVOY
DESIGNED BY:	B. MCAVOY	CHECKED BY:	J. SCHULTZ
tbl40xsl1		SHEET	12 OF 13

MAST ARM #1
LOOKING WEST ON
VT 100



12+16

NOTE: THE FOUNDATION DEPTHS
ARE NOT TO SCALE (TYP).

467.9681 THEORETICAL
467.41 ACTUAL

MAST ARM CROSS SECTION SHEET 2

PROJECT NAME: WATERBURY
PROJECT NUMBER: NHG SGNL(27)

FILE NAME: traf/05b140/tb140wrk.dgn	PLOT DATE: 13-NOV-2007
PROJECT LEADER: J. SCHULTZ	DRAWN BY: B. MCAVOY
DESIGNED BY: B. MCAVOY	CHECKED BY: J. SCHULTZ
tbM0xs2.J	SHEET 13 OF 13

