

# TRAFFIC SIGNAL & GENERAL NOTES

## A. NEW EQUIPMENT

1. ALL SIGNAL HEADS SHALL BE POLYCARBONATE. THE HOUSING, HEADS, DOORS, MOUNTING HARDWARE AND VISORS SHALL BE FLAT BLACK.
2. PEDESTRIAN HEADS, POLES AND BASES TO BE ALUMINUM AND BLACK IN COLOR. POLES AND BASES TO FOLLOW COLOR SPECIFICATION SET FORTH FOR ALUMINUM LIGHT POLES.
3. ALL TRAFFIC SIGNAL INDICATIONS SHALL BE LED'S WITH A VISIBLE BEAM SPREAD OF EIGHTY DEGREES OFF AXIS.
4. THE CONTROLLERS SHALL BE ECONOLITE BRAND, MODEL ASC/2S-2100.
5. THE MASTER CONTROLLER SHALL ECONOLITE BRAND, MODEL ASC/2M-2100 ~~1000~~
6. THE CONTROLLER SHALL HAVE AN EMERGENCY POWER CONNECTION DEVICE.
7. THE CONTROLLER SHALL BE INSTALLED WITH PREEMPTION EQUIPMENT.
8. ID PLAQUES SHALL BE AFFIXED TO ALL CONTROLLERS.
9. ALL CABINETS SHALL BE GROUND MOUNTED CABINETS AND SHALL HAVE A BASE EXTENSION.
10. THE CABINET SHALL BE EQUIPPED WITH A PULL-OUT SHELF CAPABLE OF SUPPORTING A LAPTOP COMPUTER.
11. THE CONTRACTOR SHALL COORDINATE WITH THE TELEPHONE COMPANY TO PROVIDE A PHONE DROP AT THE CONTROLLER LOCATION. THE COST OF THE PHONE DROP HOOK-UP SHALL BE INCLUDED IN ITEM 678.15.
12. A DISCONNECT BREAKER FOR EACH CIRCUIT SHALL BE INSTALLED IN A RAINPROOF (NEMA 3R), LOCKED CABINET ON A STANCHION BELOW THE METER SOCKET. USE OPTION #3 ON STANDARD SHEET E-175.
13. FIBER OPTIC NO TURN ON RED SIGNS SHALL BE PROVIDED AS SHOWN ON THE SIGNAL DRAWINGS. THESE WILL BE PAID INCLUSIVE OF ITEM 678.15.

## B. TRAFFIC SIGNAL INTERCONNECT CABLE AND CONDUIT

1. THE TRAFFIC SIGNAL INTERCONNECT CABLE SHALL CONSIST OF TWO INDEPENDANT SYSTEMS WITHIN THE SAME CONDUIT. THE FIRST SYSTEM SHALL BE TELEMETRY SYSTEM USING A TWISTED PAIR OF TELEPHONE GRADED COMMUNICATIONS CABLES. THE SECOND SYSTEM SHALL CONSIST OF A 12 - CONDUCTOR HARDWIRE INTERCONNECT CABLE. ALL CABLES SHALL MEET THE APPROPRIATE INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION (ISMA) SPECIFICATIONS FOR THAT PARTICULAR APPLICATION.
2. INITIAL COORDINATION SHALL BE BY TELEMETRY. TBC'S & HARDWIRE ARE FOR BACKUP.
3. ~~INTERCONNECT CABLE SHALL BE FIBEROPTIC.~~

REMOVE  
HARDWIRE

## C. REMOVAL OF EXISTING OR REUSE OF EXISTING EQUIPMENT

1. ALL REMOVED AND NOT REUSED EQUIPMENT(HEADS,CONTROLLERS,CABINETS,POLES ETC.) SHALL BE STOCKPILED AND DELIVERED TO THE DISTRICT 5 FACILITY ON BARNES AVE IN COLCHESTER. REMOVAL OF EQUIPMENT SHALL INCLUDE REMOVAL OF CONCRETE BASES AND BACKFILL OF THE HOLES, WHERE APPLICABLE, ANY EQUIPMENT THAT IS DAMAGED BY THE CONTRACTOR DURING REMOVAL SHALL BE REPAIRED OR REPLACED, TO THE SATISFACTION OF THE STATE, AT THE CONTRACTOR'S EXPENSE.
2. EXISTING CONTROLLERS AND CABINETS TO BE REMOVED AND DELIVERED INCLUDE:

INTERSECTION NAME	CONTROLLER	CABINET
PINE HAVEN SHORES	TCT LMD 8000	ECONOLITE 8-PHASE
HOLMES ROAD	TCT LMD 8000	ECONOLITE 8-PHASE
BARTLETT BAY ROAD	TCT LMD 8000	ECONOLITE 8-PHASE
HOLMES ROAD	TCT LMD 8000	ECONOLITE 4-PHASE

## D. SIGNAL OPERATION

1. SIGNAL TIMING SHOWN ON THE PLANS FOR MINIMUM AND MAXIMUM GREEN, GAPS, OFFSETS AND CLEARANCE INTERVALS MAY REQUIRE FINE TUNING IN THE FIELD BASED ON TRAFFIC OBSERVATION.
2. NEW TRAFFIC SIGNAL(S) SHALL BE OPERATED IN THE FLASH MODE FOR A MINIMUM OF 24 HOURS PRIOR TO BEING PUT INTO FULL OPERATION. FULL OPERATION SHALL NOT BE INITIATED EXCEPT IN THE PRESENCE OF THE TRAFFIC OPERATIONS ENGINEER OR HIS DESIGNATED REPRESENTATIVE. WHEN THE NEW TRAFFIC SIGNAL IS REPLACING A PREEXISTING SIGNAL, THE NEW SYSTEM WILL BE PLACED IN FULL OPERATION IMMEDIATELY AFTER THE OLD SYSTEM IS REMOVED.
3. THE TRAFFIC SIGNALS SHALL NOT OPERATE BEFORE THE PAVEMENT MARKINGS AND SIGNAL RELATED SIGNING IS IN PLACE. OPERATION OF THE TRAFFIC SIGNAL SHALL NOT CONFLICT WITH PAVEMENT MARKING INDICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, STOP BAR PLACEMENT.
4. PHASE 2 & 6 SHALL BE USED FOR DWELL AND START-UP FOLLOWING FLASH OPERATION.
5. SWITCHOVER FROM EXISTING TO REPLACEMENTS SIGNALS SHALL NOT BE DONE DURING PEAK TRAFFIC PERIODS. STRONG CONSIDERATION SHOULD BE GIVEN TO EVENING SWITCHOVER. UTO'S SHALL CONTROL TRAFFIC DURING SWITCHOVER.

## E. PULLBOXES AND JUNCTION BOXES

1. PULLBOXES AND JUNCTION BOXES ARE DETAILED ON STANDARD SHEET E-173. MINIMUM JUNCTION BOX SIZE SHALL BE 18" X 12" X 12" (A X B X C), OR LARGER AS REQUIRED BY THE ELECTRICAL CODE.
2. PULLBOXES, IF PLACED IN THE ROADWAY OR SHOULDER, SHALL HAVE STEEL COVERS OF A MINIMUM THICKNESS OF 1/2" AND SHALL MEET ASTM A-36. THESE COVERS SHALL BE HELD IN PLACE WITH 3/8" DIA. STAINLESS STEEL PENTA-HEAD BOLTS. THE COVER SHALL BE APPROPRIATELY MACHINED SO THAT THE BOLT HEADS ARE FLUSH WITH COVER.
3. ALL SPLICES IN PULLBOXES/JUNCTION BOXES SHALL BE SOLDERED AND SEALED IN A WATERPROOF EPOXY SPLICE KIT.
4. JUNCTION BOXES SHALL INCLUDE A HEAVY DUTY COVER.

## F. TRAFFIC SIGNAL CONDUIT

1. ALL TRAFFIC SIGNAL CONDUIT SHALL BE PVC WITH SCHEDULE 40 MINIMUM USED UNDERGROUND AND SCHEDULE 80 USED ABOVE GROUND.
2. MINIMUM CONDUIT SIZES SHALL BE:
  - A) 1-1/2" FOR LOOP LEAD-INS
  - B) 2" FOR ALL OTHERS
SEE CHART ON STANDARD SHEET E-172 FOR DESIGN VALUES
3. WHEN CONDUIT IS PLACED BELOW THE ROADWAY OR ACROSS SIDE ROADS, IT SHALL BE PLACED IN A PVC SLEEVE, AS SHOWN ON THE PLANS (6" MINIMUM).
4. THE MINIMUM DEPTH BELOW THE ROADWAY SURFACE FOR THE PLACEMENT OF SLEEVES AND CONDUIT SHALL BE 5 FEET. THE MINIMUM DEPTH BELOW SIDEWALK OR GROUND FOR THE PLACEMENT OF SLEEVE AND CONDUIT SHALL BE 3 FEET.
5. SIX INCH WIDE YELLOW PLASTIC MARKING TAPE SHALL BE PLACED IN THE EXCAVATED TRENCH 6 TO 12 INCHES ABOVE THE CONDUIT AND SLEEVE RUNS EXCEPT THOSE JACKED UNDER THE ROADWAY.

## G. VEHICLE DETECTOR LOOPS

1. VEHICLE DETECTOR LOOP INSTALLATION SHALL BE IN ACCORDANCE WITH THE DETAILS ON STANDARD SHEET E-172, VEHICLE DETECTOR LOOP DETAILS.

## H. GENERAL

1. ALL ELECTRICAL WORK AND MATERIALS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE STATE ELECTRICAL INSPECTOR. ALL WORK MUST MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
2. PAYMENT WILL BE MADE TO THE CONTRACTOR AFTER COMPLETION OF THE 30-DAY TEST PERIOD. THE CONTRACTOR WILL CONTINUE TO BE RESPONSIBLE FOR THE SIGNALS UNTIL PROJECT ACCEPTANCE. AFTER PROJECT ACCEPTANCE, THE TRAFFIC SIGNAL INSTALLATION(S) SHALL BECOME THE PROPERTY AND RESPONSIBILITY OF THE STATE OF VERMONT.
3. THE CONTRACTOR SHALL ACQUIRE ALL 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 UTILITY COMPANY HAS FULL RESPONSIBILITY FROM THE SOURCE TO THE WEATHERHEAD AND THE STATE SHALL MAINTAIN FROM THAT POINT THROUGH THE SIGNAL. NO INTERVENING OWNERSHIP/RESPONSIBILITY SHALL BE ALLOWED.
4. A METAL PLAQUE LISTING OWNERSHIP AND EMERGENCY PHONE NUMBERS SHALL BE ATTACHED TO THE OUTSIDE OF THE CONTROLLER CABINET. THE DETAIL OF THIS PLAQUE CAN BE FOUND ON SIGNAL DWG. NO. 02. CONTACT THE AREA DISTRICT TRANSPORTATION ADMINISTRATOR FOR APPROPRIATE NUMBER.
5. THE REQUIRED 30 DAY TEST PERIOD FOR THE SIGNAL EQUIPMENT SHALL NOT BEGIN UNTIL ALL CONSTRUCTION IS COMPLETE AND ALL PAPERWORK HAS BEEN DONE TO THE SATISFACTION OF THE AGENCY. THE CONTRACTOR WILL RETAIN OWNERSHIP OF THE SIGNAL SYSTEMS THROUGH THE COMPLETION OF THE ENTIRE PROJECT (NOT INCLUDING LANDSCAPING), OR THE SUCCESSFUL COMPLETION OF THE 30-DAY TEST PERIOD, WHICHEVER IS LATER. THIS INCLUDES ANY REQUIRED MAINTENANCE AND POWER COST.
6. TRAFFIC SHALL BE CONTROLLED BY A UNIFORM TRAFFIC OFFICER(S) WHENEVER THE SIGNALS ARE NOT WORKING CORRECTLY.
7. EXISTING SYSTEMS SHALL REMAIN IN PLACE AND BE UTILIZED IN THE TRAFFIC CONTROL PLAN. CONTRACTOR SHALL MODIFY, AS REQUIRED, AND APPROVED BY THE ENGINEER DURING THE PLAN. PAYMENT TO BE MADE UNTER ITEM 678.40 - TEMPORARY TRAFFIC SIGNAL SYSTEM.
8. VEHICLE DETECTOR LOOPS, CONDUIT, PULLBOXES, JUNCTION BOXES, AND INTERCONNECT CABLE SHALL BE PAID UNDER THEIR OWN ITEM NUMBERS. ALL OTHER SIGNAL EQUIPMENT, LABOR, REMOVAL OF EXISTING EQUIPMENT, ETC., UNLESS OTHERWISE STATED, SHALL BE PAID UNDER THE TRAFFIC SIGNALS (ITEM 678.15). EACH INTERSECTION SHALL BE A SEPARATE PAY ITEM.

## I. PRE-EMPTION

1. OPTICOM PRIORITY CONTROL SYSTEM (OR APPROVED COMPATABLE EQUIVALENT) SHALL CONSIST OF ALL EQUIPMENT NECESSARY TO RUN THE OPTICALLY ACTIVATED PRE-EMPTION. PAYMENT SHALL BE MADE UNDER THE 678.15 ITEMS. EQUIPMENT SHALL INCLUDE, BUT NOT LIMITED TO:
  - A. CONCEALED-TYPE EMITTERS FOR 3 VEHICLES. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY MATERIALS. INSTALLATION SHALL BE BY FIRE DEPARTMENT PERSONNEL. (THE VEHICLE TYPES & NUMBERS WILL BE VERIFIED AT THE PRE-CONSTRUCTION CONFERENCE)
  - B. DETECTORS FOR 4 INTERSECTIONS. 2-WAY AT 3 INTERSECTIONS AND 3-WAY AT HOLMES ROAD. THESE PHASES SHALL HOLD FOR A PRESET AMOUNT OF TIME (SET INITIALLY AT 45 SEC.) AFTER LOSS OF SIGNAL AT THE REMOTE DETECTOR.
  - C. PHASE SELECTOR MODULES AND ALL NECESSARY INSTALLATION EQUIPMENT FOR 4 INTERSECTIONS.
  - D. SHIELDED DETECTOR CABLE. THIS CABLE SHALL NOT BE RUN IN THE SAME CONDUIT AS THE SIGNAL POWER CABLE.
  - E. STROBE LIGHTS FOR EACH OF THE INTERSECTIONS. THESE SHALL BE WIRED SUCH THAT THEY GO ON AT THE START OF GREEN OF THE PRE-EMPTION PHASE TO NOTIFY EMERGENCY VEHICLE DROIVERS THAT THE PRE-EMPT IS IN EFFECT.
  - F. SPARE PARTS: 2 DETECTORS AND 4 STROBE LIGHT BULBS.(FOR CONFIRMATION LAMPS.)
2. IMPLEMENTATION:
  - A. THE HOLD AND DURATION SETTINGS SHALL BE DETERMINED IN THE FIELD BASED UPON AT LEAST 4 TEST RUNS (AM, NOON, PM AND OFF PEAK). THESE TEST RUNS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER AND BOTH THE FIRE DEPARTMENT AND CITY OFFICIALS. TESTING & FINE-TUNING SHALL BE INCIDENTAL TO THE SIGNAL INSTALLATIONS - ITEM 678.15.
  - B. ONCE ONE PRE-EMPT HAS BEEN ACTIVATED (NB OR SB), THE OTHER SHALL BE CAPABLE OF ACTIVATION UNTIL THE FIRST ONE TIMES OUT.

## J. ELECTRICAL PERMIT

1. THE CONTRACTOR SHALL PLACE ELECTRICAL PERMITS AND BILLING IN HIS NAME (NOT THAT OF THE STATE OR MUNICIPALITY) UNLESS PRIOR WRITTEN PERMISSION IS GRANTED BY THE ENGINEER. FAILURE TO COMPLY WILL RESULT IN NON-ACCEPTANCE OF THE FACILITIES OR DELAY TO THE 30-DAY TEST PERIOD IN THE CASE OF SIGNALS, UNTIL THE SITUATION IS REMEDIED.

## K. ELEVATION REQUIREMENTS: (SEE SIGNAL DRAWING 7 & 8)

1. THERE ARE ELEVATION REQUIREMENTS FOR SIGNAL AND LIGHTING POLE BASES. THIS IS DUE TO THE URBAN NATURE AND CLOSE PROXIMITY TO SIDEWALK. THESE GRADES ARE CRITICAL. IF THESE BASES ARE NOT WITHIN 1" OF REQUIRED, THE RESULT WILL BE NON-ACCEPTANCE OF THE FACILITIES OR DELAY TO THE 30-DAY TEST PERIOD IN THE CASE OF SIGNALS, UNTIL THE SITUATION IS REMEDIED.

## L. SIGNALS

1. THREE EXISTING SIGNALS WILL BE MAINTAINED DURING CONSTRUCTION SEQUENCING AND MODIFIED AS NECESSARY FOR THIS PROJECT. THE ITEM 678.40 TEMPORARY TRAFFIC CONTROL SYSTEM HAS BEEN INCLUDED FOR THIS PURPOSE. SEE TRAFFIC CONTROL DRAINGS 1 & 2 FOR MORE INFORMATION.

DATUM  
VERTICAL NGVD 1929  
HORIZONTAL NAD 1927

AS-BUILT REVISIONS		
NO.	DATE	DESCRIPTION
1.	3/7/06	NOTES REVISED PER ADDENDUM #2

4/4/03

SHELburnE - SOUTH BURLINGTON

SURVEYED BY V.S.C. INC. DATE \_\_\_\_\_  
DRAWN BY E.A.A. INC. DATE \_\_\_\_\_  
TRACED BY E.A.A. INC. DATE \_\_\_\_\_

PROJECT NH-EGC-019-4(28)  
SIGNAL DRAWING NO. 1  
SHEET NO. 126 OF 283