

12PSX0242 EXHIBIT A1

TRAFFIC CONTROL DURING MAINTENANCE OPERATIONS (English Version)

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS: Traffic control patterns shall be used when a work operation requires that all or part of any vehicle protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

1. Speed and volume of traffic.
2. Duration of operation.
3. Exposure to hazards.

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 20 through 25 may be used for moving operations such as painting, pot hole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and flaggers shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Engineer or Supervisor must contact both the District Traffic Representative and the District Safety Advisor for assistance prior to setting up a traffic control pattern.

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PLACEMENT OF SIGNS: Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs may be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

Allowable Adjustment of Signs and Devices
Shown on the Traffic Control Plans

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer or Supervisor to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer or Supervisor may require that the signing pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I – MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

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PAVING OPERATIONS ON HIGHWAYS – WORK BY CONTRACTOR:

The Engineer or Supervisor will be assigned to each project to coordinate the traffic control for paving operations and determine the number of traffic control personnel required.

The District Traffic Representative will determine the hours of the paving operations and will coordinate the paving operations with other construction activities in the immediate area. The District Traffic Representative will be available to assist field forces on traffic control issues and may contact the Division of Traffic Engineering for additional assistance.

When work hours on a particular project have been established, an on-site meeting between the Department and the Contractor will be held two weeks prior to the starting date. If the District Traffic Representative determines that it is necessary, a news release will be prepared and distributed to the local papers, radio stations, State Police, and municipalities.

MOVING OPERATIONS - WORK BY STATE FORCES:

The Engineer or Supervisor will be assigned to each project and will direct the entire moving operation. If the Engineer or Supervisor must leave the operation, a substitute shall be assigned to continue the operation.

All personnel involved in this work will be instructed by the Engineer or Supervisor regarding the proper application of traffic control patterns that will be used to complete the work.

The first advance warning to the motorist shall be vehicle #1 which shall be located considering ramps, grades, curves, volumes, and speed of the traffic. This vehicle shall not restrict any portion of the travelway on multilane highways, except as noted on plans.

All vehicles shall have the appropriate illuminated warning devices.

INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

Lane Closures shall be installed beginning with the advanced warning signs and proceeding forward toward the work area.

Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advanced warning signs.

USE OF TRUCK MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)

On limited access, high volume roadways, a TMA shall be placed prior to the first work area in the traffic control pattern. If there are multiple work areas within the same pattern, then additional TMAs may be positioned at each additional work area in the pattern as needed.

TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area.

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TRAFFIC CONES

Traffic Cones shall be fluorescent orange PVC with 6" and 4" white retroreflective collars. Traffic cones shall be 36" minimum in height and 12 lbs. minimum in weight with the following approximate dimensions: 14" square base, 2 ¼" top O.D., 10 ½" bottom O.D.

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NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN THE INSTALLATION OF AN ADDITIONAL SIGN (A) IN ADVANCE OF THE STOPPAGE SHOULD BE CONSIDERED.
2. SIGNS (AA), (A) AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE #1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. A CHANGEABLE MESSAGE SIGN MAY BE UTILIZED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
5. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 72 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA WILL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS REOPENED TO ALL LANES OF TRAFFIC.
7. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED AND TEMPORARY PAVEMENT MARKINGS THAT DEPICT THE PROPER TRAVEL PATHS SHALL BE INSTALLED.
8. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 200' ON LOW SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
9. FOR SHORT DURATION OPERATIONS, 4 TRUCK MOUNTED ATTENUATOR UNITS MAY BE USED TO CREATE THE TAPER IN LIEU OF TRAFFIC CONES/DRUMS.
10. FOR THE INSTALLATION OF PAVEMENT MARKINGS, VEHICLE 1 SHALL HAVE A SIGN WITH THE LEGEND "LINE PAINTING".



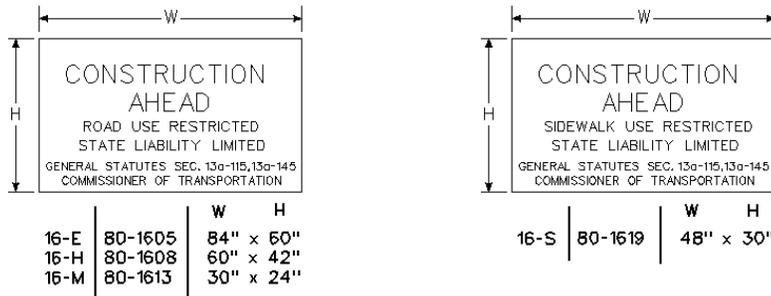
REV'D 7-02

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DIVISION OF TRAFFIC ENGINEERING

MAINTENANCE
TRAFFIC CONTROL PLAN
NOTES

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SERIES 16 SIGNS



THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED- ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMP PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS SHOULD BE INSTALLED AS DIRECTED BY THE ENGINEER OR SUPERVISOR, OR MAY BE FOUND ELSEWHERE IN THE PLANS.

IF SIGNS ARE TO BE POST MOUNTED THEN:

SIGN 16-E OR 16-H SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H OR 16-M SHALL BE USED ON ALL RAMP, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

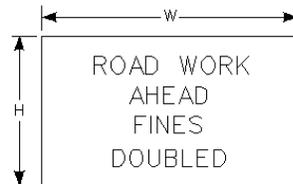
SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

IF SIGNS ARE TO BE MOUNTED ON PORTABLE SUPPORTS, THEN SIGN 16-M SHALL BE USED.

REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHEN THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS. THE "ROAD WORK AHEAD, FINES DOUBLED" REGULATORY SIGNS SHALL NOT BE INSTALLED ON TOWN ROADS.

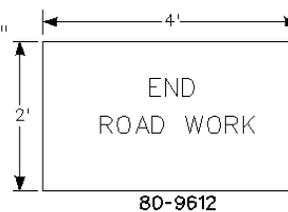
THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.



31-1906 48" x 42"

"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



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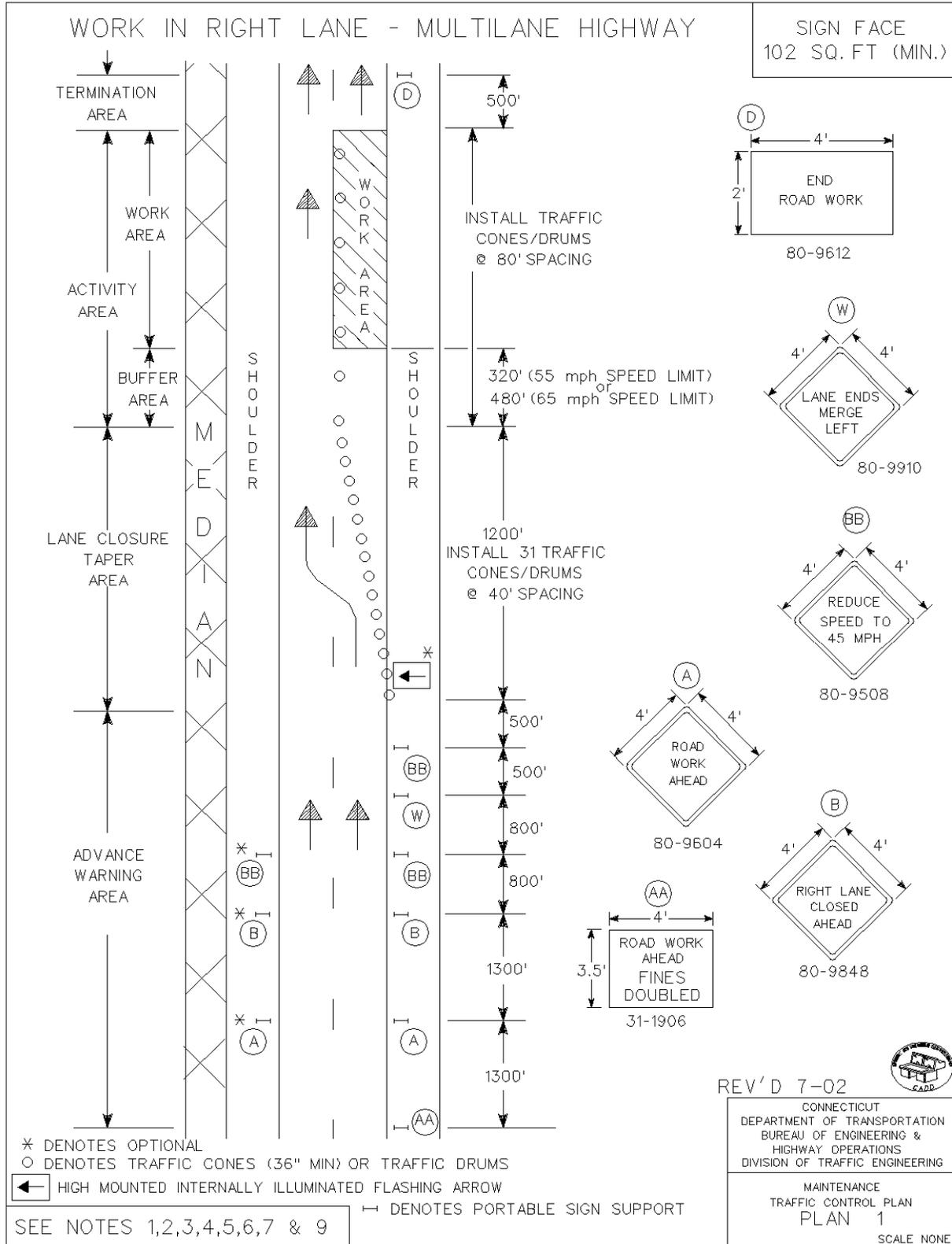


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TRAFFIC CONTROL PLAN

REQUIRED SIGNS

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* DENOTES OPTIONAL

O DENOTES TRAFFIC CONES (36" MIN) OR TRAFFIC DRUMS

← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

┌ DENOTES PORTABLE SIGN SUPPORT

SEE NOTES 1,2,3,4,5,6,7 & 9

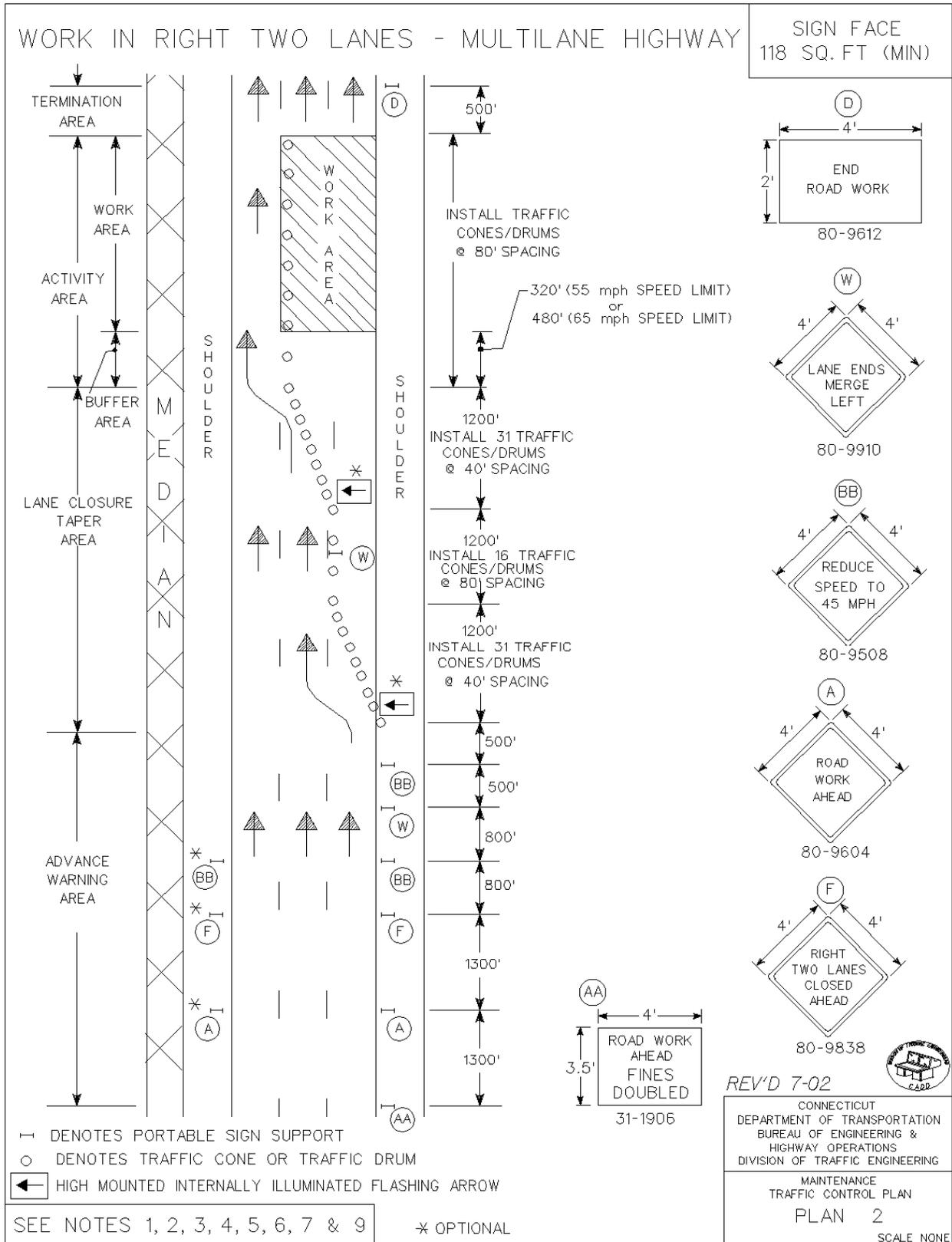
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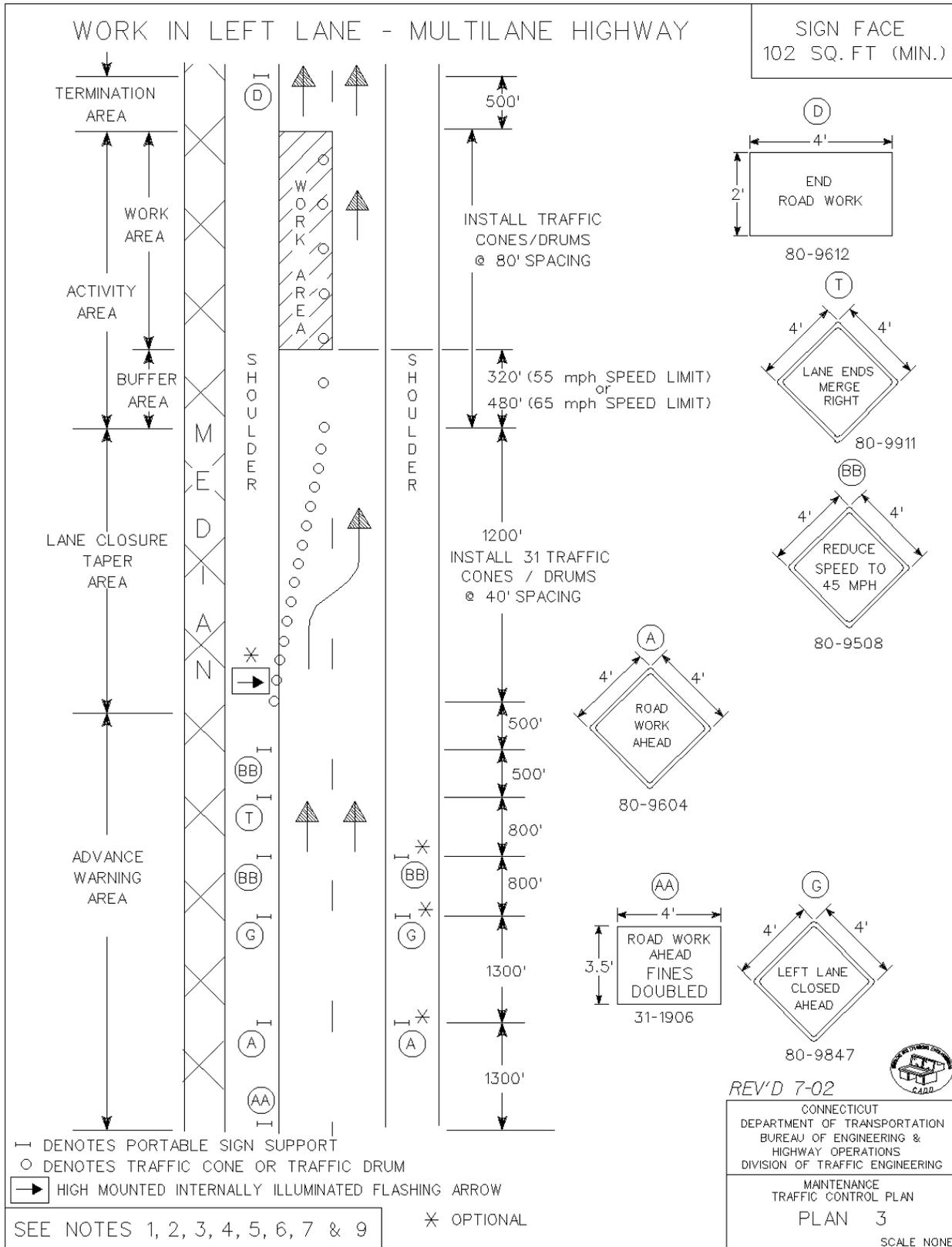
MAINTENANCE
TRAFFIC CONTROL PLAN
PLAN 1

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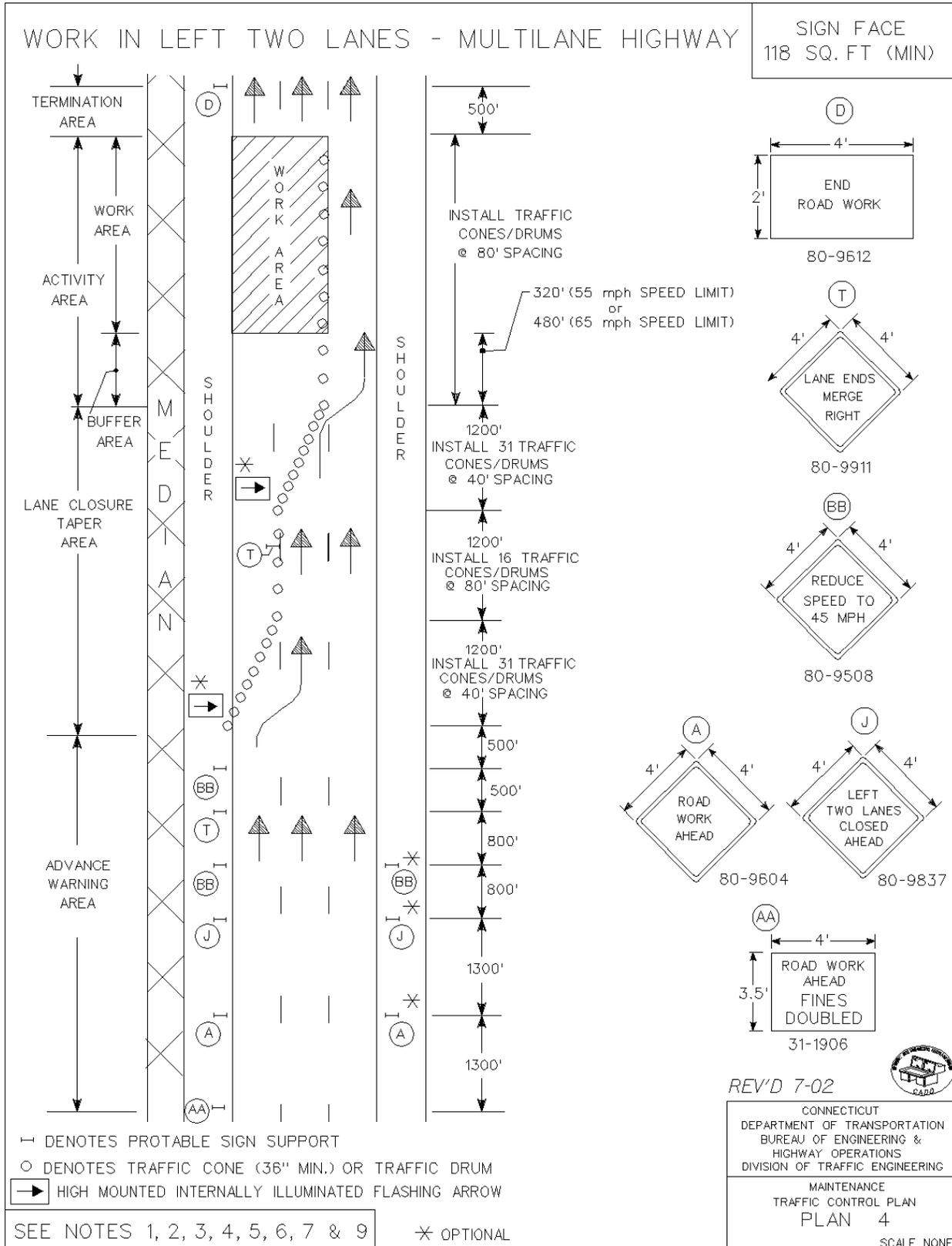
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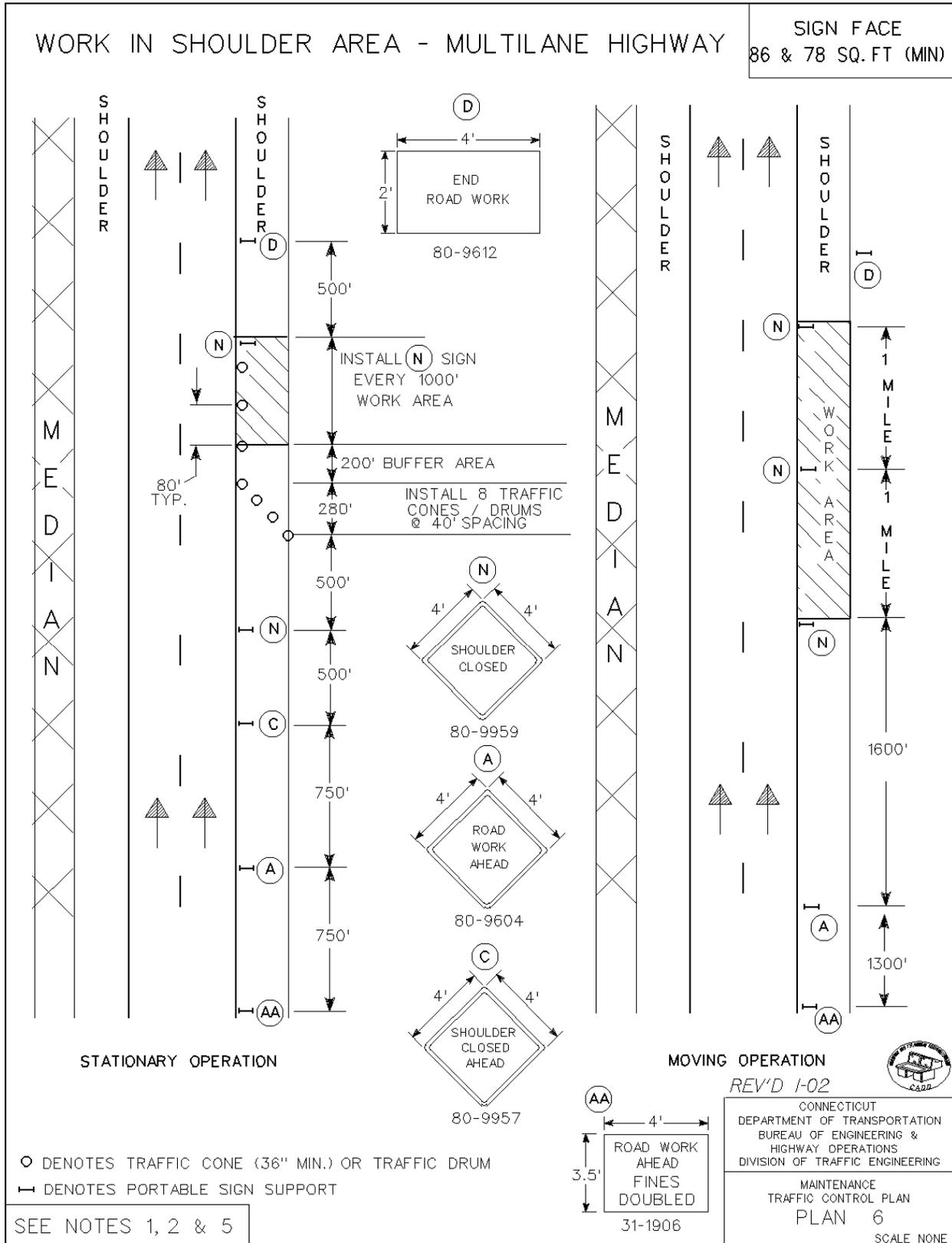
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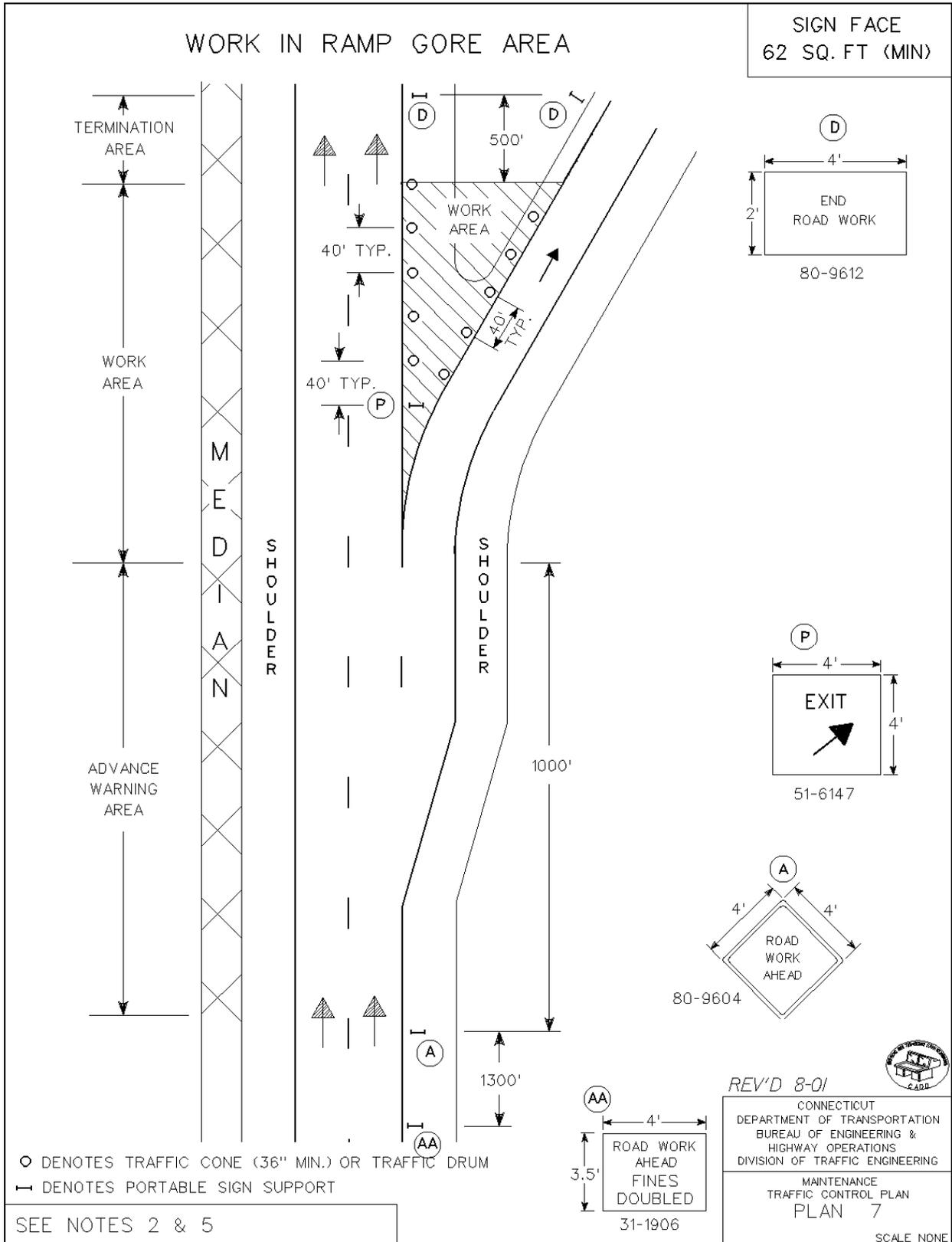
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12PSX0242 EXHIBIT A1



12PSX0242 EXHIBIT A1



○ DENOTES TRAFFIC CONE (36" MIN.) OR TRAFFIC DRUM
 → DENOTES PORTABLE SIGN SUPPORT

SEE NOTES 2 & 5

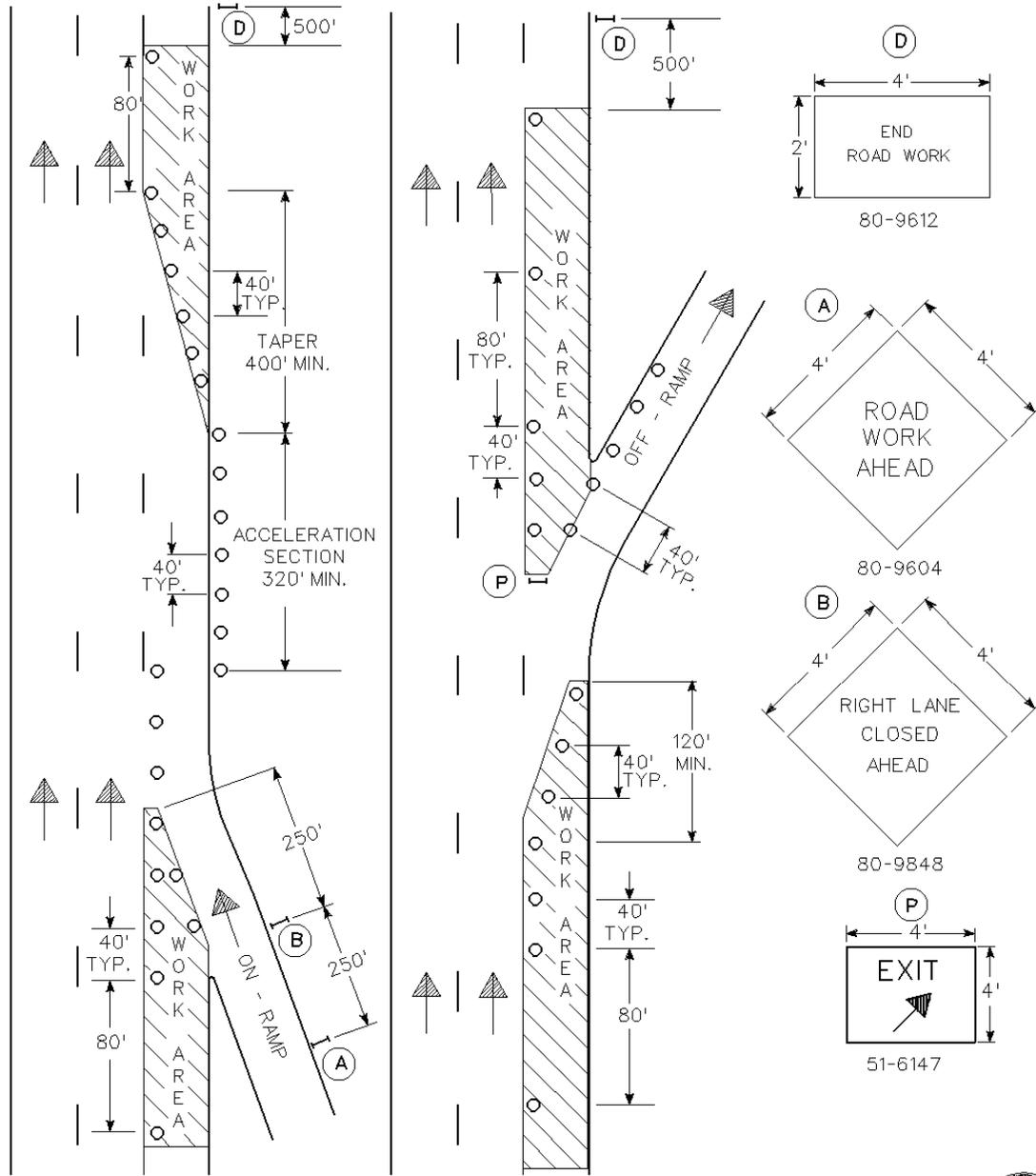
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 MAINTENANCE
 TRAFFIC CONTROL PLAN
 PLAN 7
 SCALE NONE

APPROVED John F. Carey DATE 8/7/01
 PRINCIPAL ENGINEER

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TYPICAL RAMP TREATMENTS FOR MAINLINE LANE CLOSURE - MULTILANE HIGHWAY

SIGN FACE SQ. FT VARIES



ON - RAMP TREATMENT

OFF - RAMP TREATMENT

USE TRAFFIC CONTROL PLAN 1 TO CLOSE THE RIGHT LANE.

⇨ DENOTES PORTABLE SIGN SUPPORT

○ DENOTES TRAFFIC CONE (36" MIN.) OR TRAFFIC DRUM

SEE NOTES 1, 2, 4, 5, 6 & 7

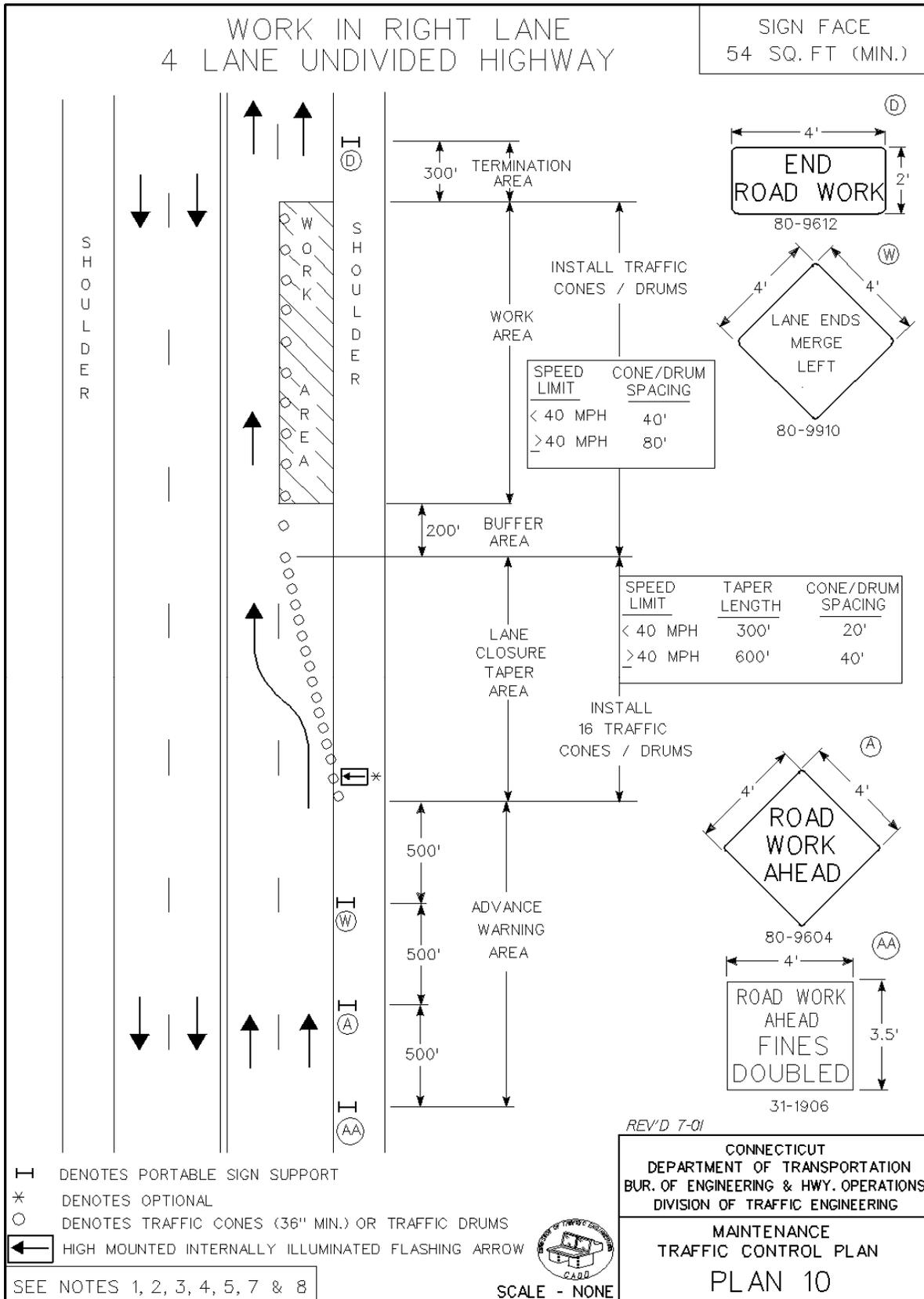
REV'D 11-01

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MAINTENANCE
TRAFFIC CONTROL PLAN
PLAN 8

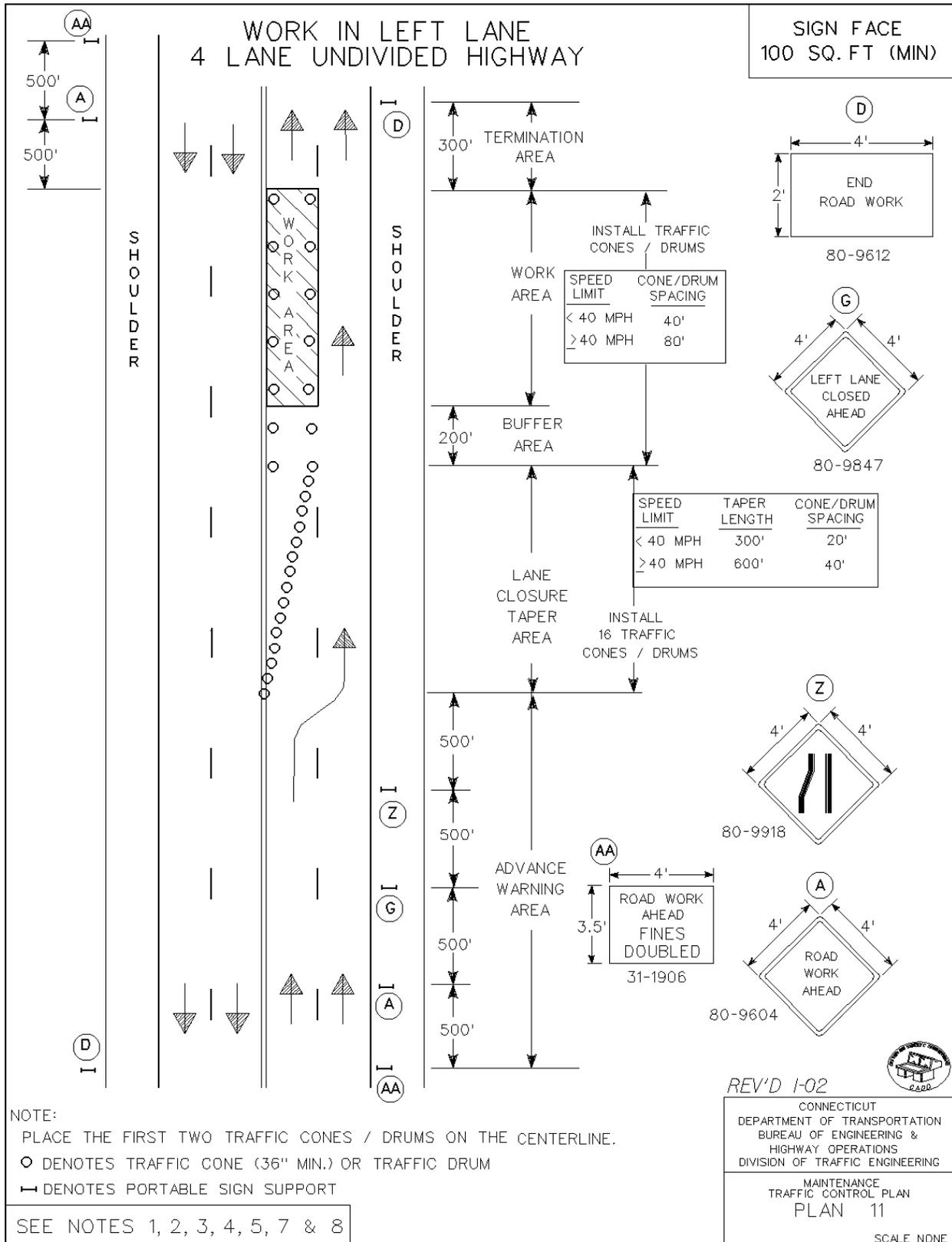
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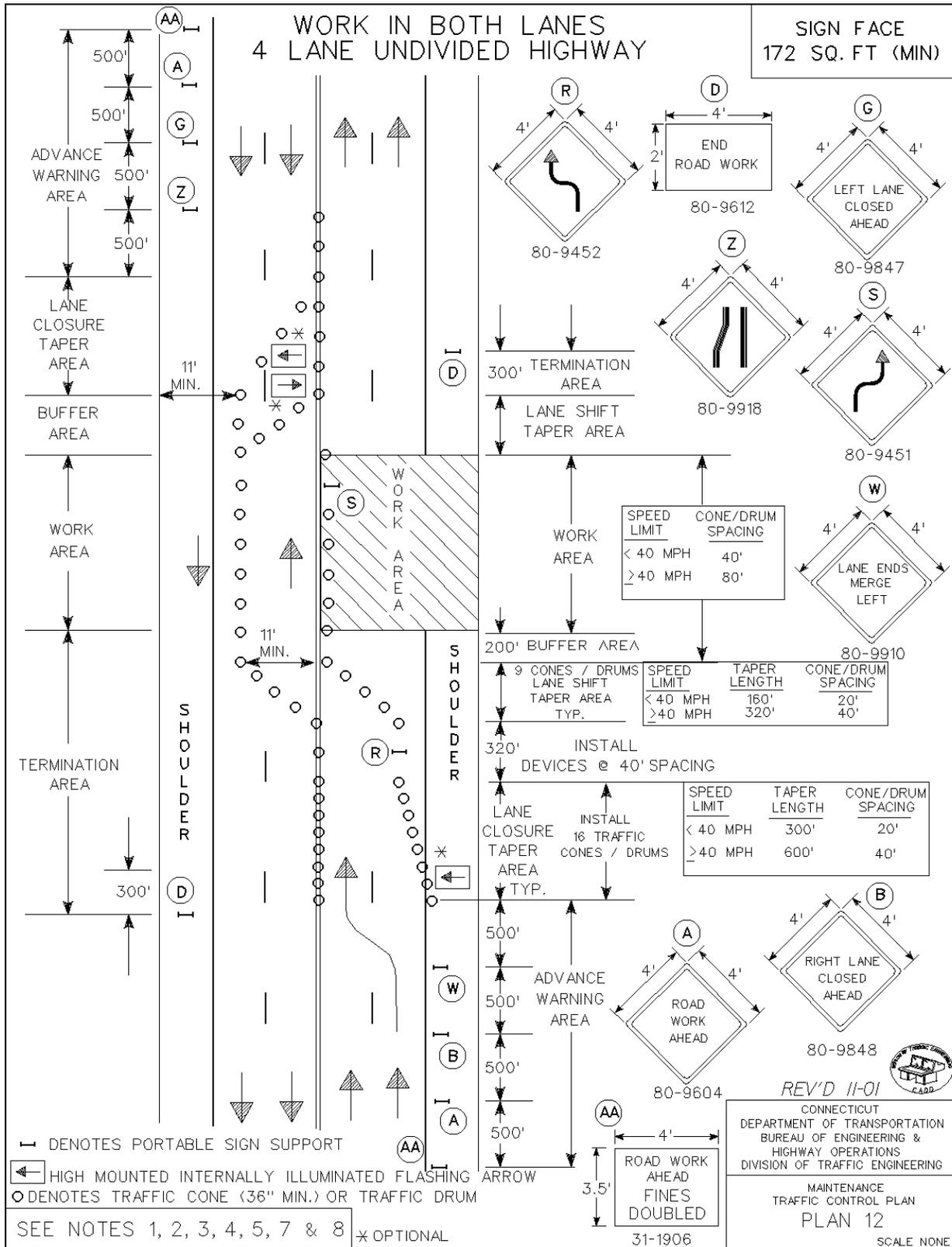


APPROVED J.F. Carey DATE 7-23-01
PRINCIPAL ENGINEER

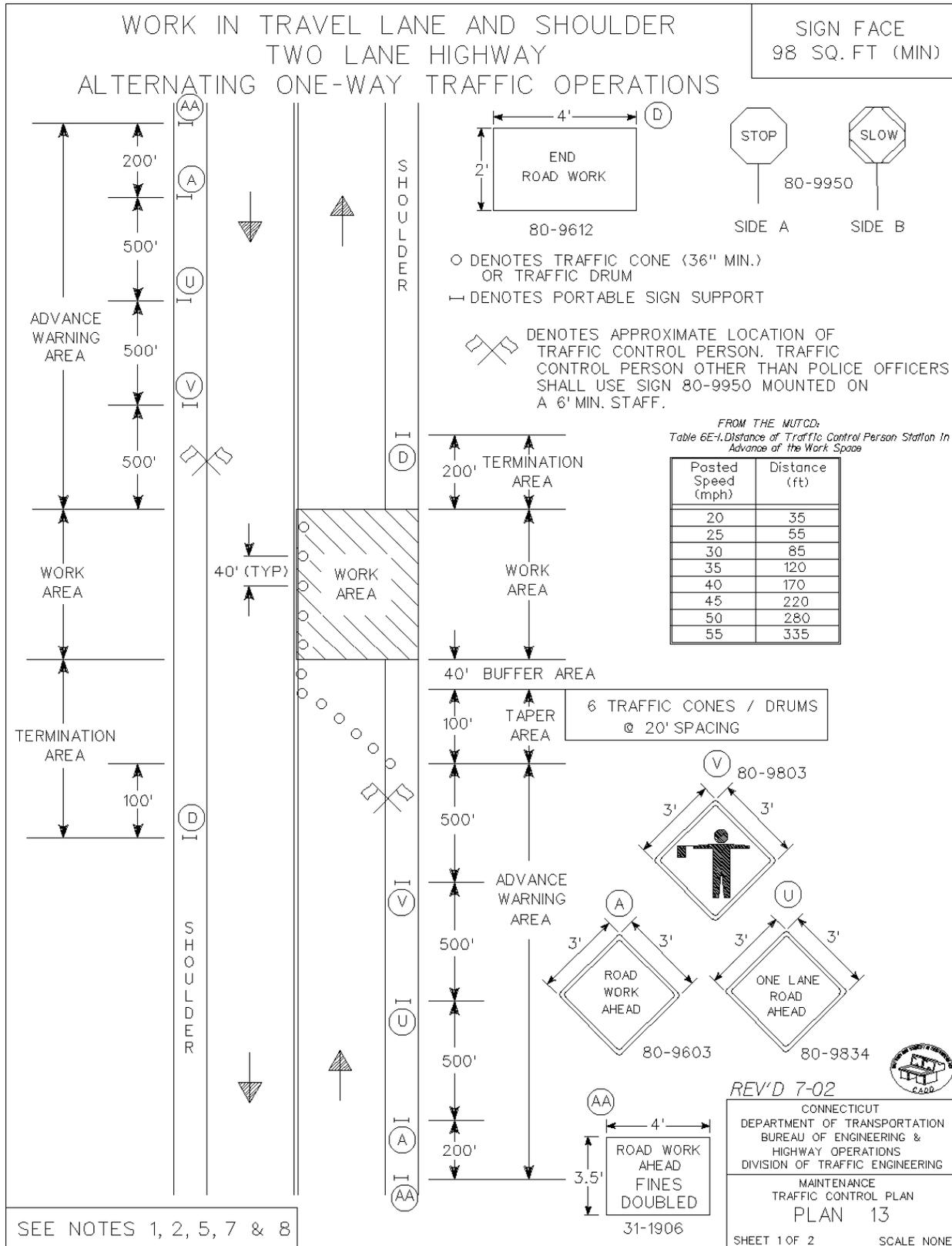
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12PSX0242 EXHIBIT A1



12PSX0242 EXHIBIT A1



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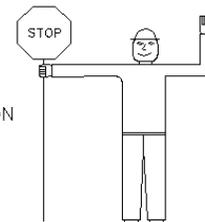
WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

HAND SIGNAL METHODS TO BE USED BY TRAFFIC CONTROL PERSONS

THE FOLLOWING METHODS FROM SECTION 6E.04 TRAFFIC CONTROL PERSON PROCEDURES IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE USED BY TRAFFIC CONTROL PERSONS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TYPICAL DETAIL SHEET ENTITLED "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

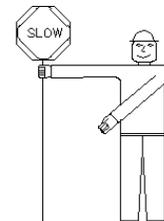
A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE TRAFFIC CONTROL PERSON SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



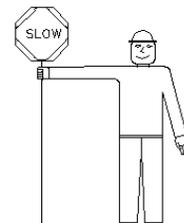
B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE TRAFFIC CONTROL PERSON SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE TRAFFIC CONTROL PERSON SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE TRAFFIC CONTROL PERSON SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE TRAFFIC CONTROL PERSON HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



SEE NOTES 1, 2, 5, 7 & 8



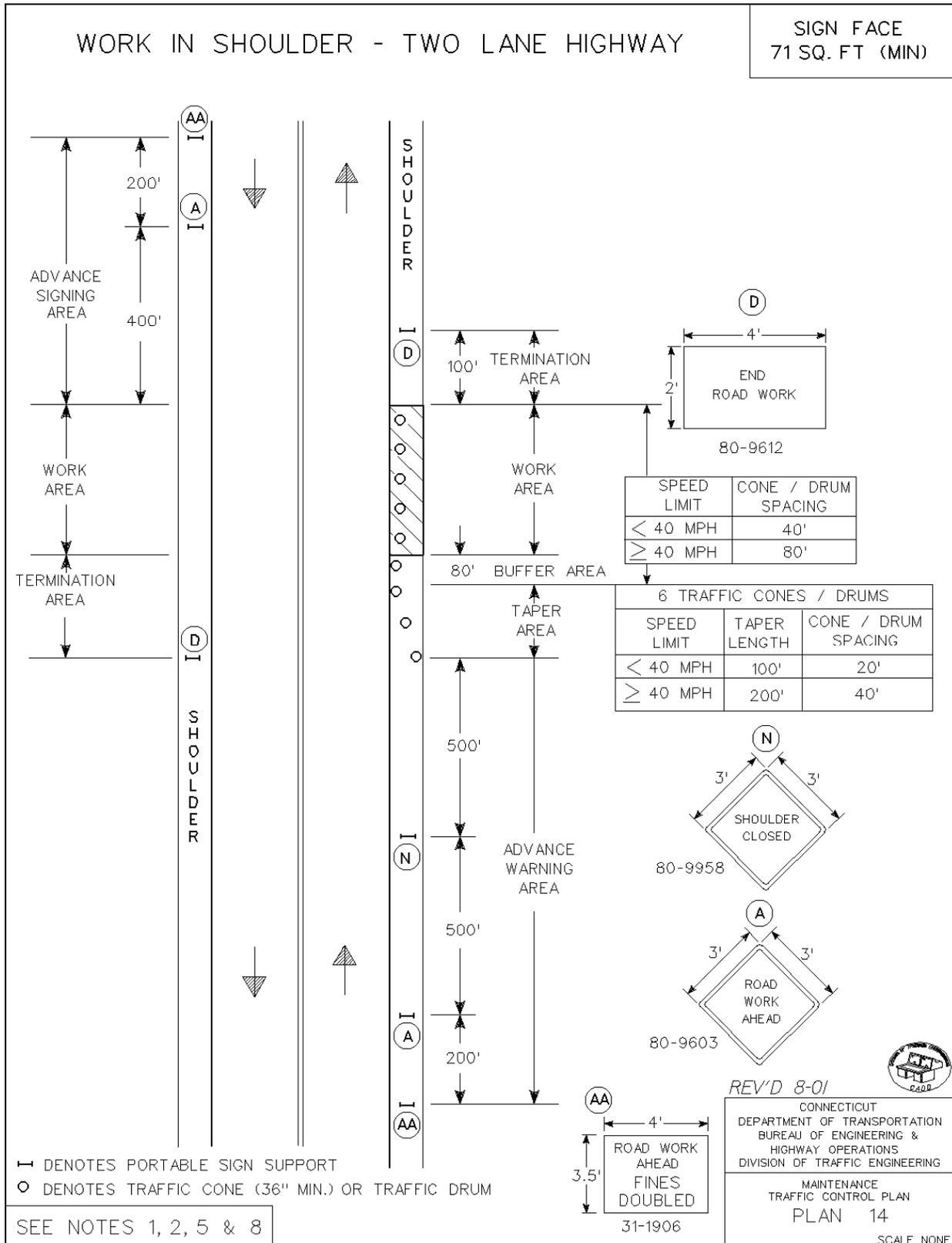
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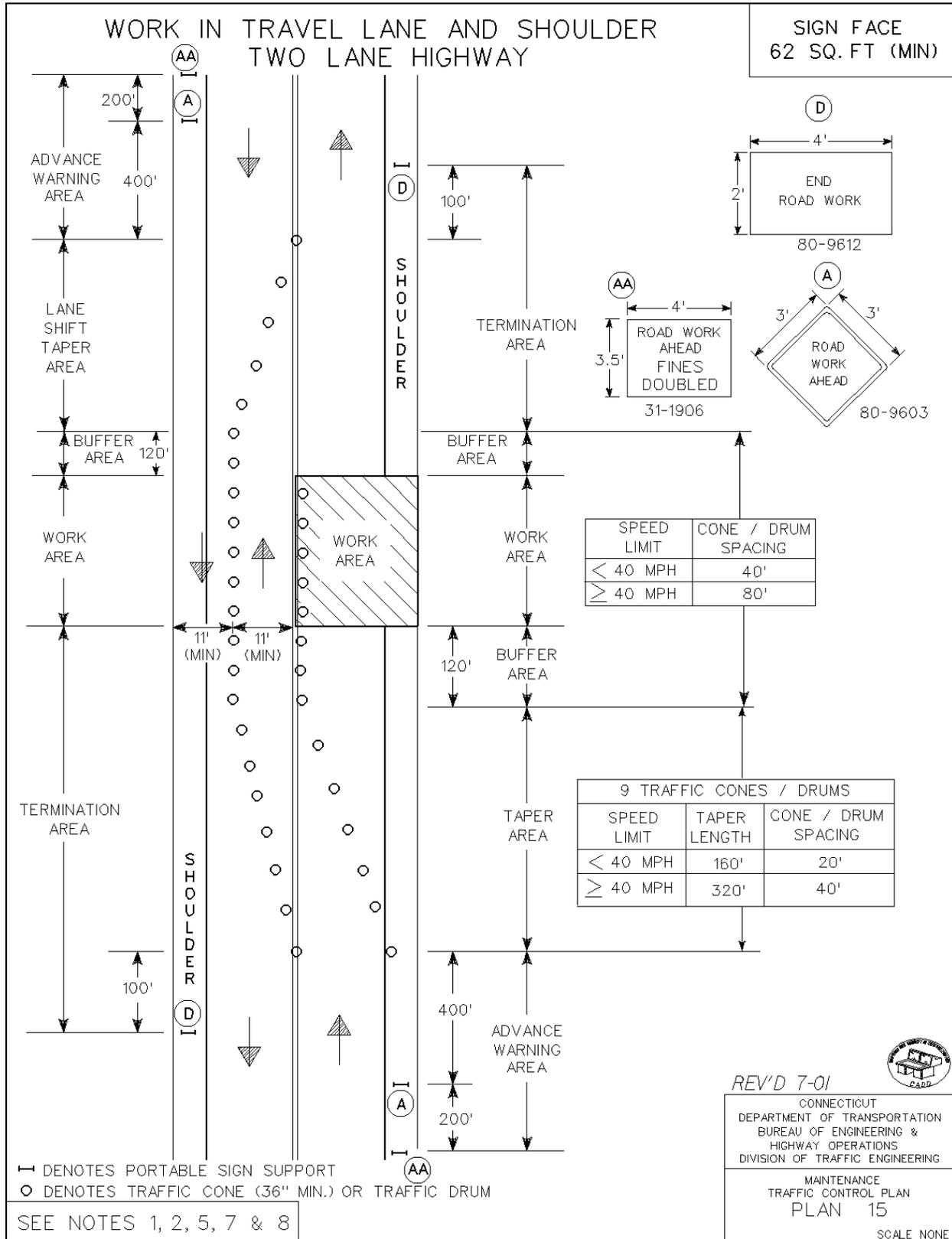
MAINTENANCE
TRAFFIC CONTROL PLAN
PLAN 13
SHEET 2 OF 2 SCALE NONE

APPROVED Charles S. Harlow DATE 7/19/02
PRINCIPAL ENGINEER

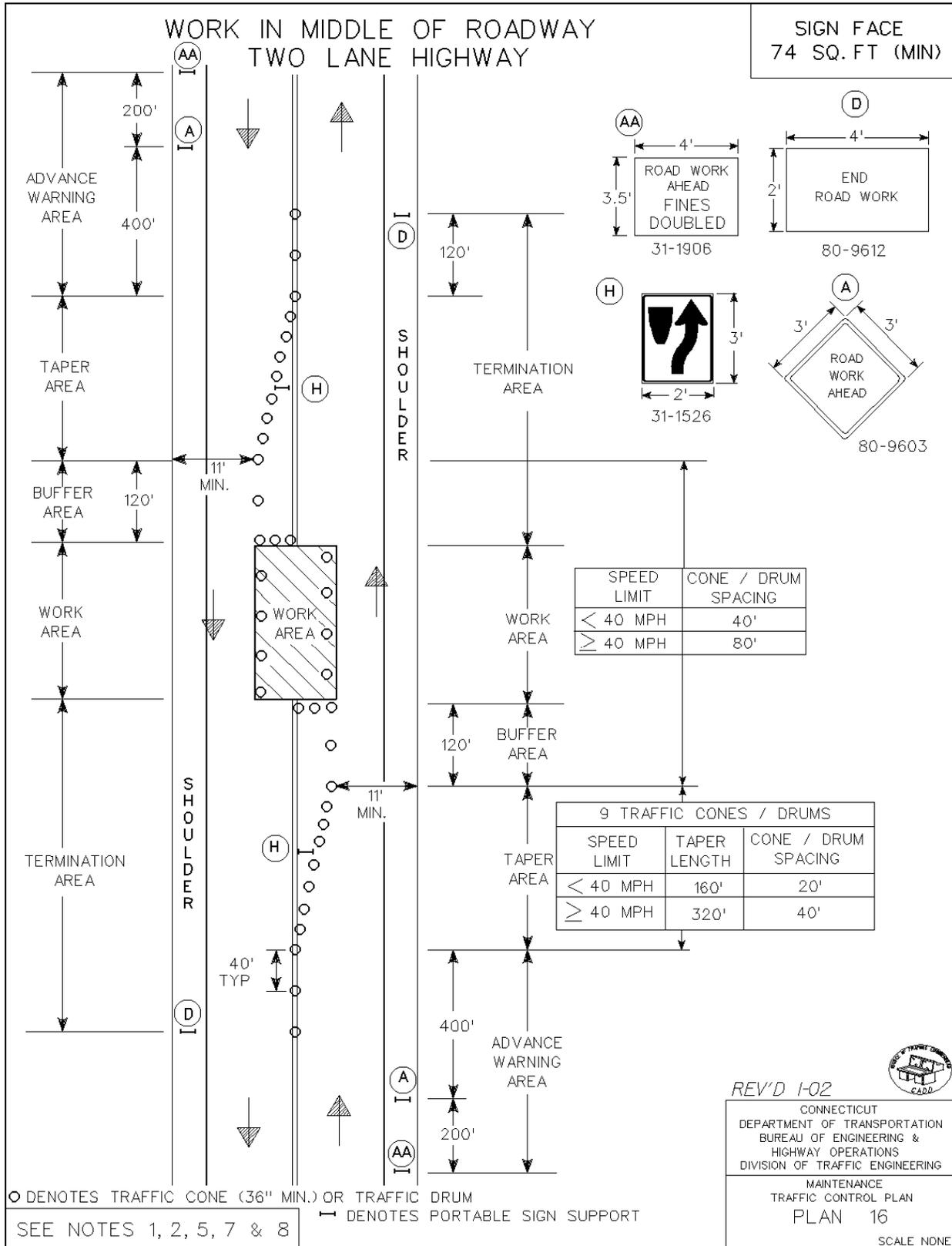
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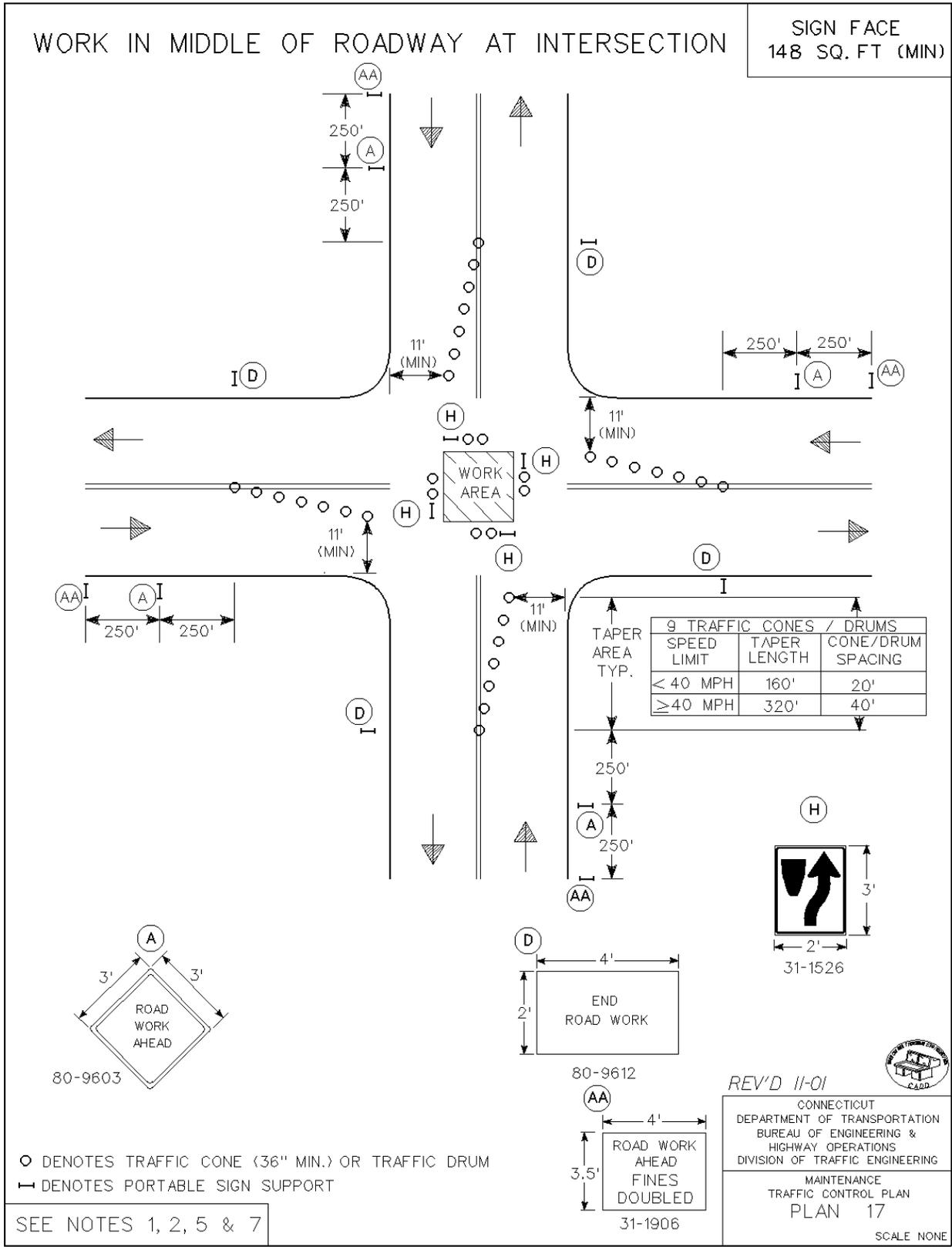
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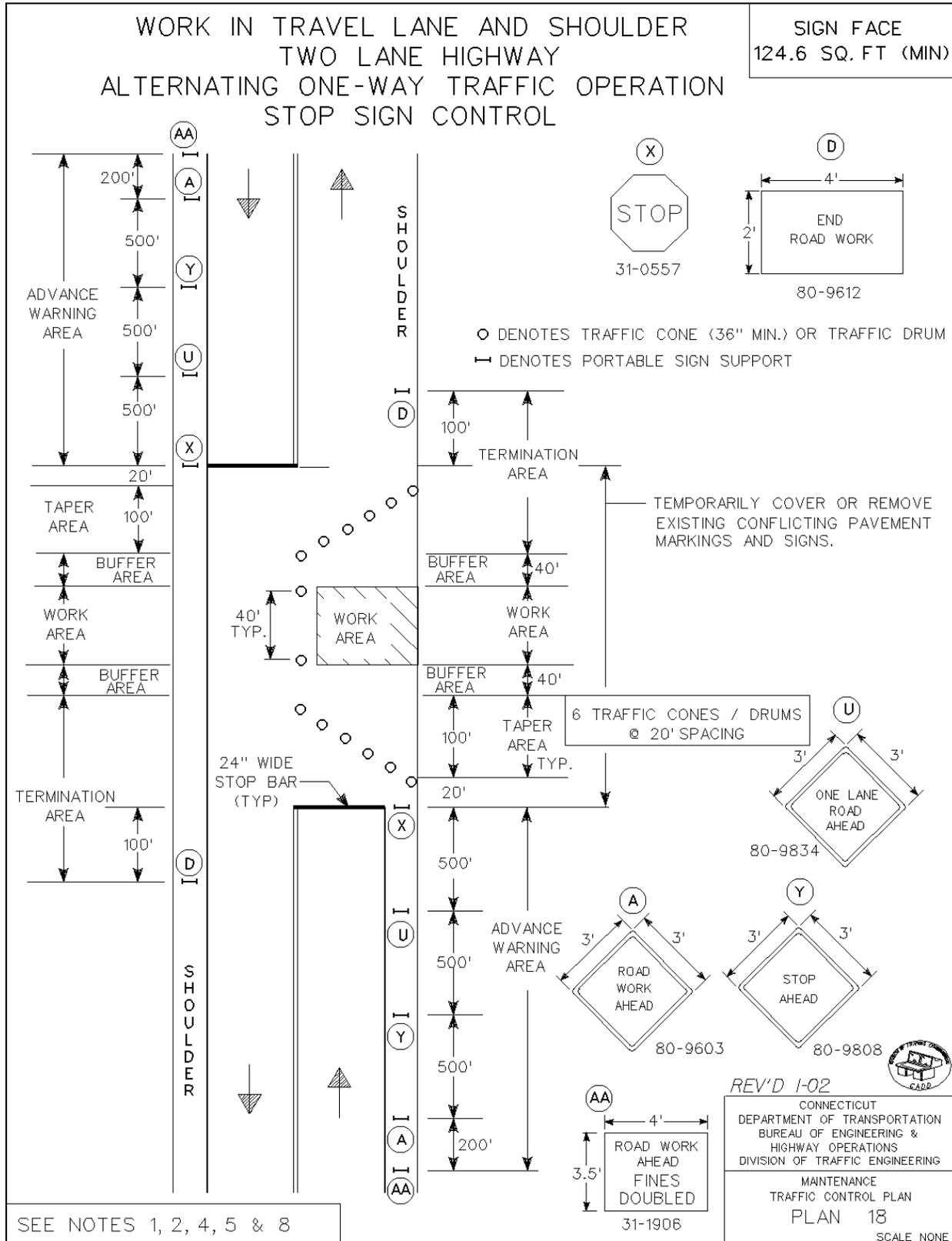


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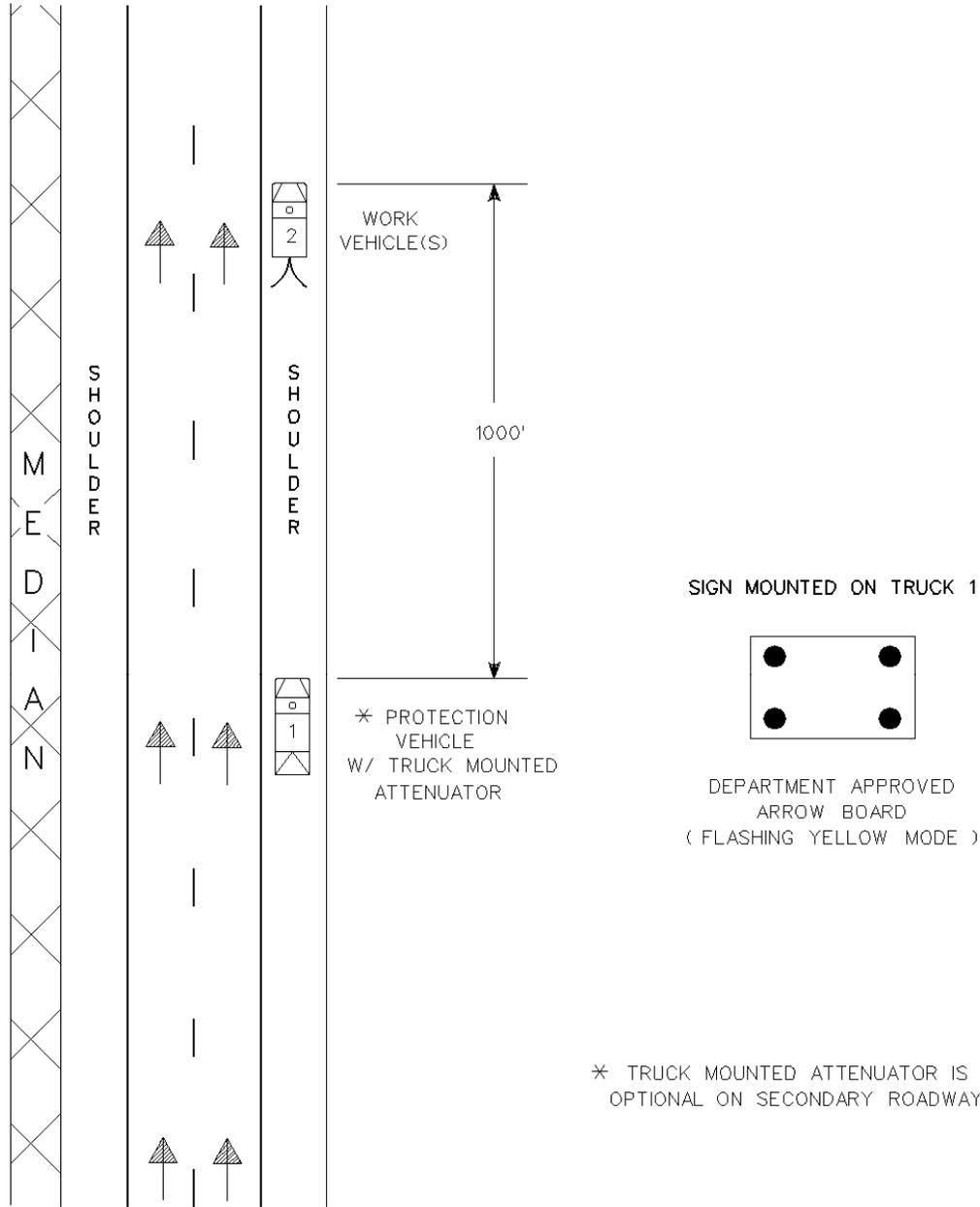
APPROVED John F. Carey DATE 11-15-01
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MOVING OPERATION ON RIGHT SHOULDER
MULTILANE HIGHWAY & SECONDARY ROADWAYS



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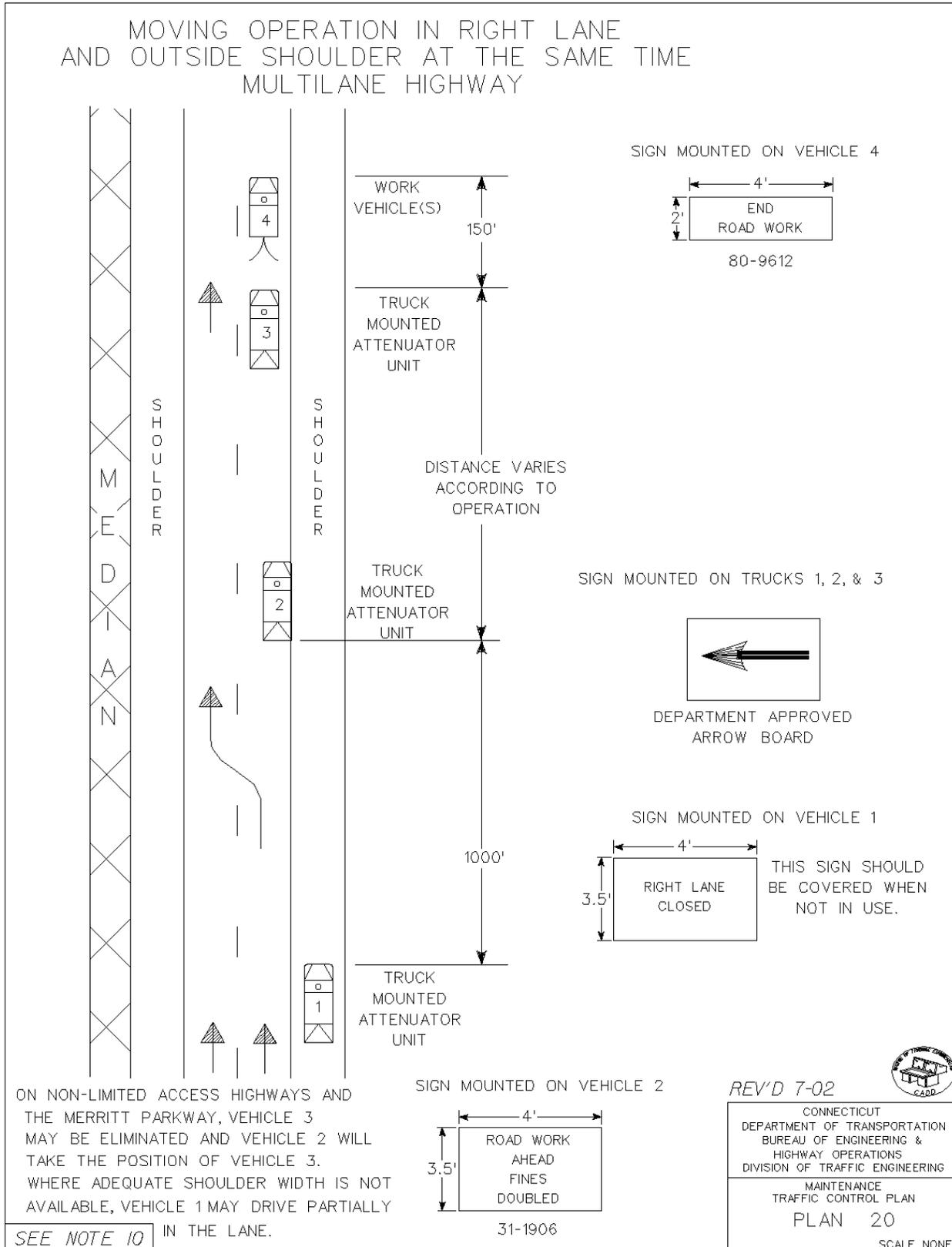
MAINTENANCE
TRAFFIC CONTROL PLAN
PLAN 19

SCALE NONE

APPROVED John D. Miceli DATE 3/27/02
PRINCIPAL ENGINEER

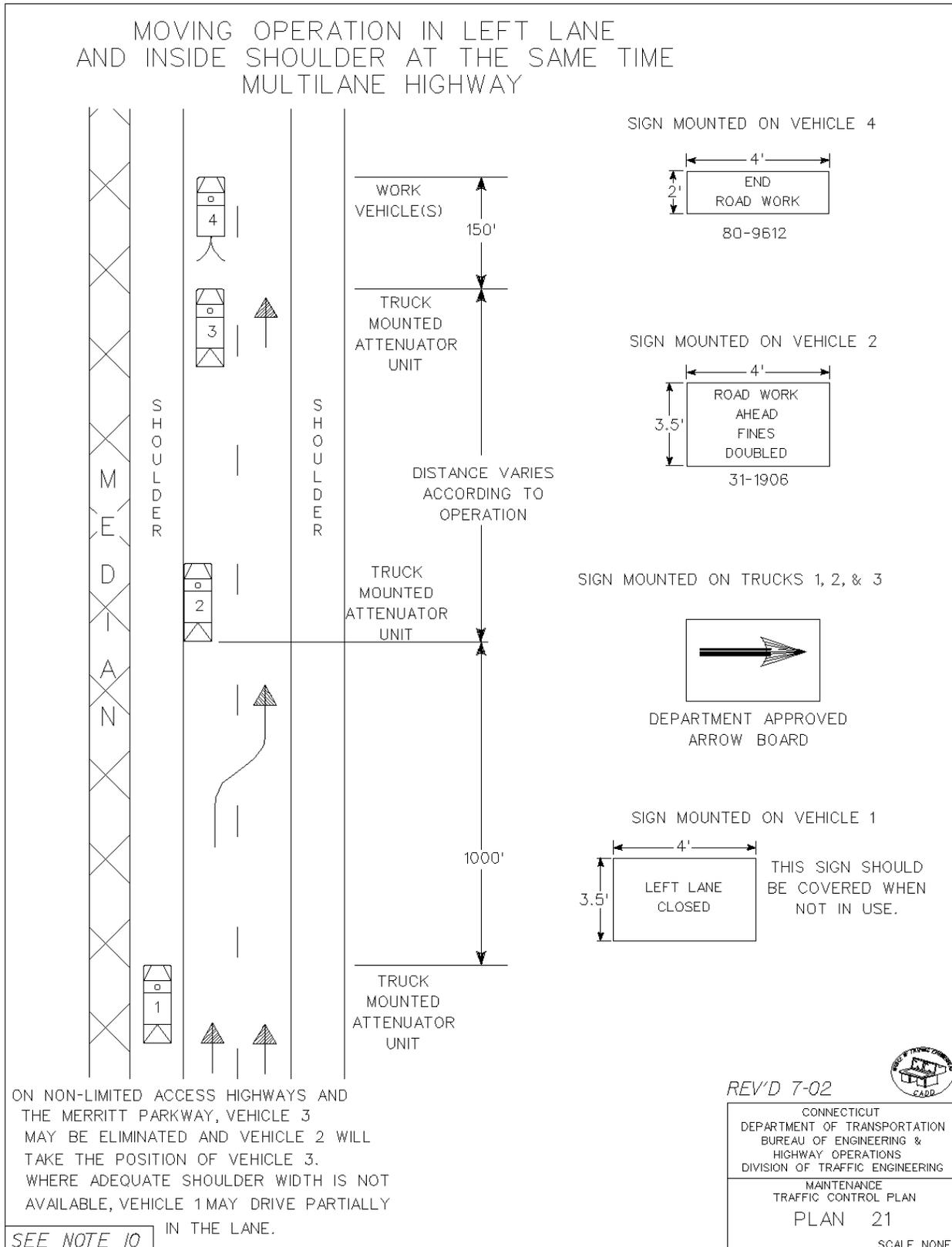
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MOVING OPERATION IN RIGHT LANE
AND OUTSIDE SHOULDER AT THE SAME TIME
MULTILANE HIGHWAY



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MOVING OPERATION IN LEFT LANE
AND INSIDE SHOULDER AT THE SAME TIME
MULTILANE HIGHWAY



ON NON-LIMITED ACCESS HIGHWAYS AND THE MERRITT PARKWAY, VEHICLE 3 MAY BE ELIMINATED AND VEHICLE 2 WILL TAKE THE POSITION OF VEHICLE 3. WHERE ADEQUATE SHOULDER WIDTH IS NOT AVAILABLE, VEHICLE 1 MAY DRIVE PARTIALLY IN THE LANE.

SEE NOTE 10

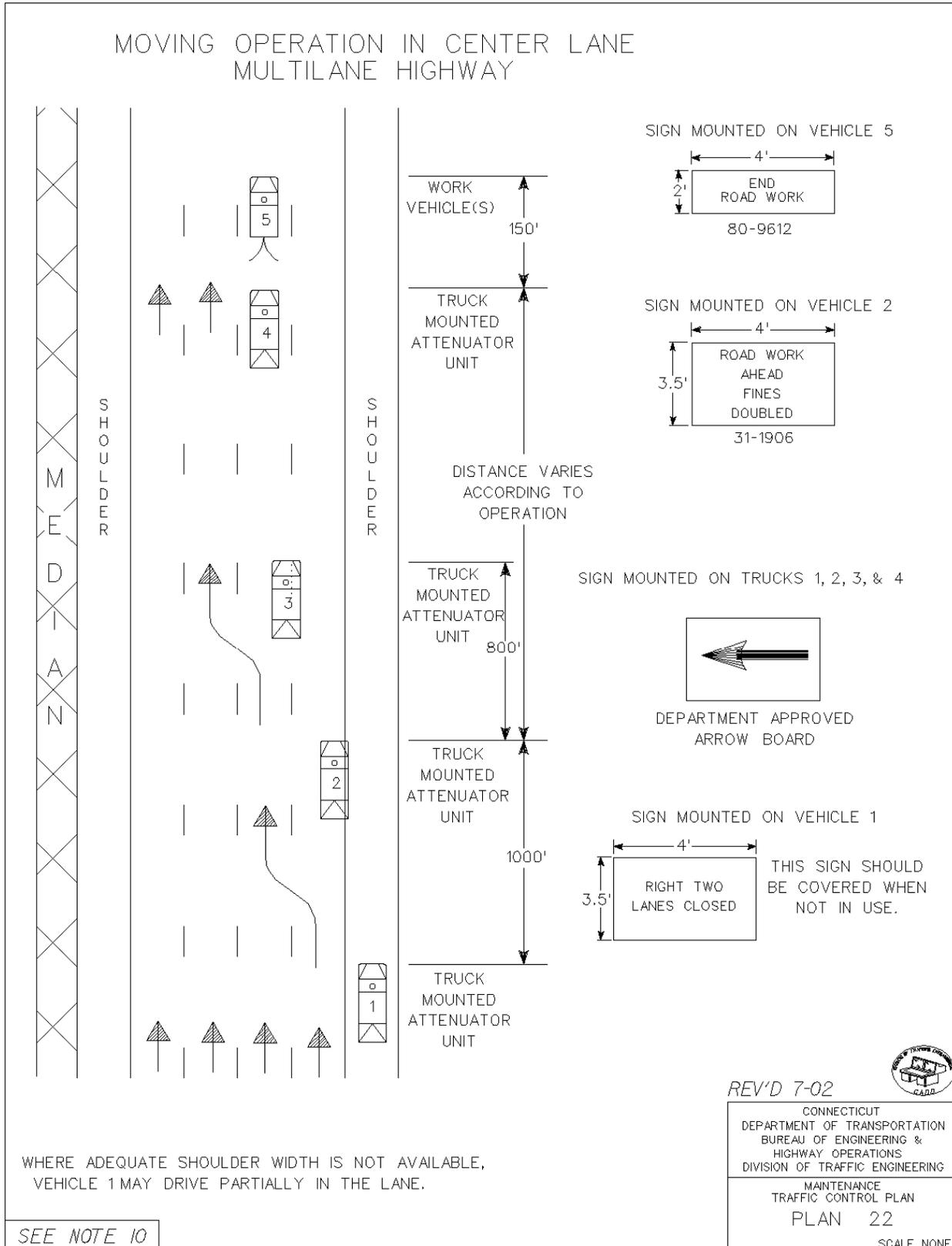
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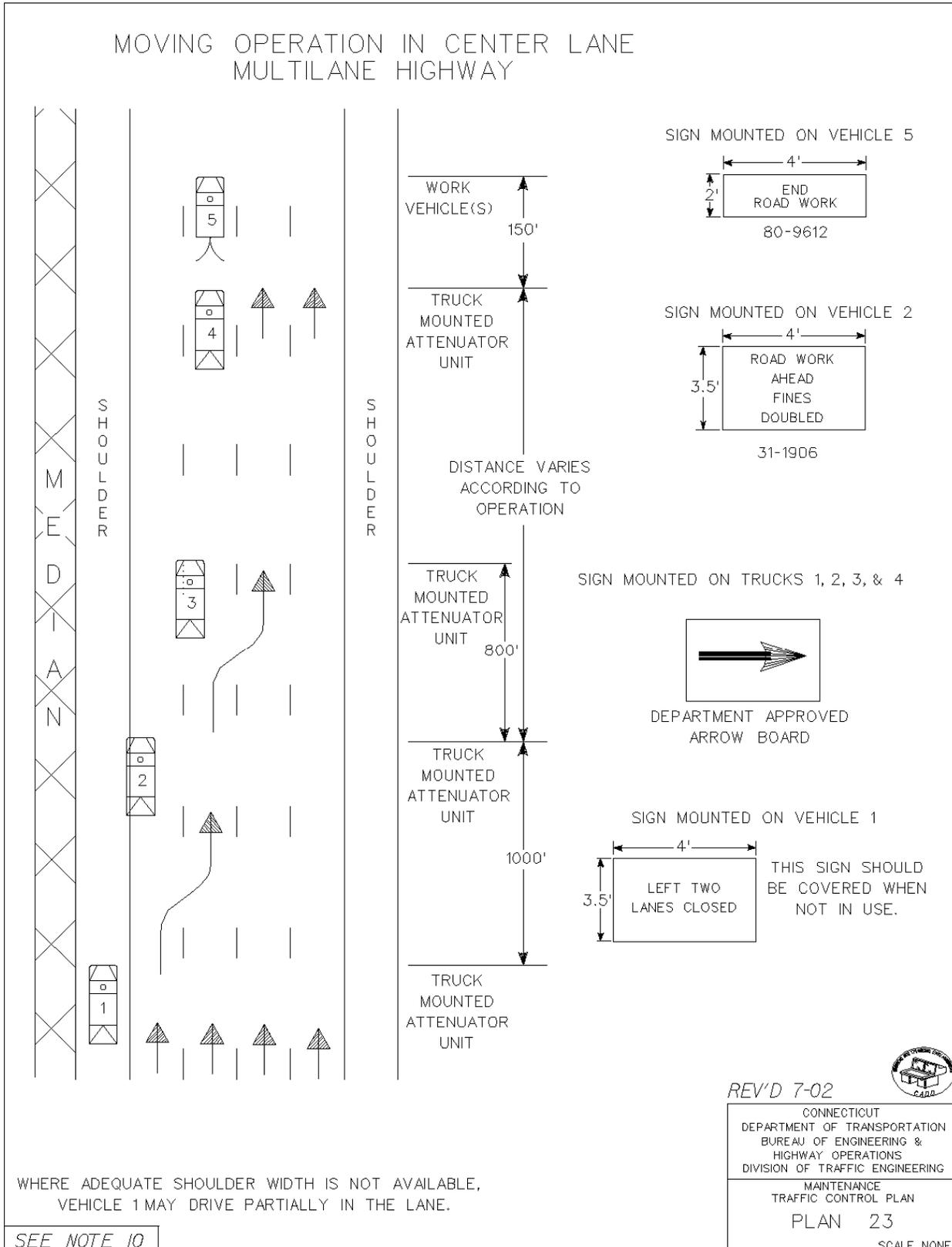
MAINTENANCE
TRAFFIC CONTROL PLAN
PLAN 21
SCALE NONE

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MOVING OPERATION IN CENTER LANE
MULTILANE HIGHWAY



WHERE ADEQUATE SHOULDER WIDTH IS NOT AVAILABLE,
VEHICLE 1 MAY DRIVE PARTIALLY IN THE LANE.

SEE NOTE 10

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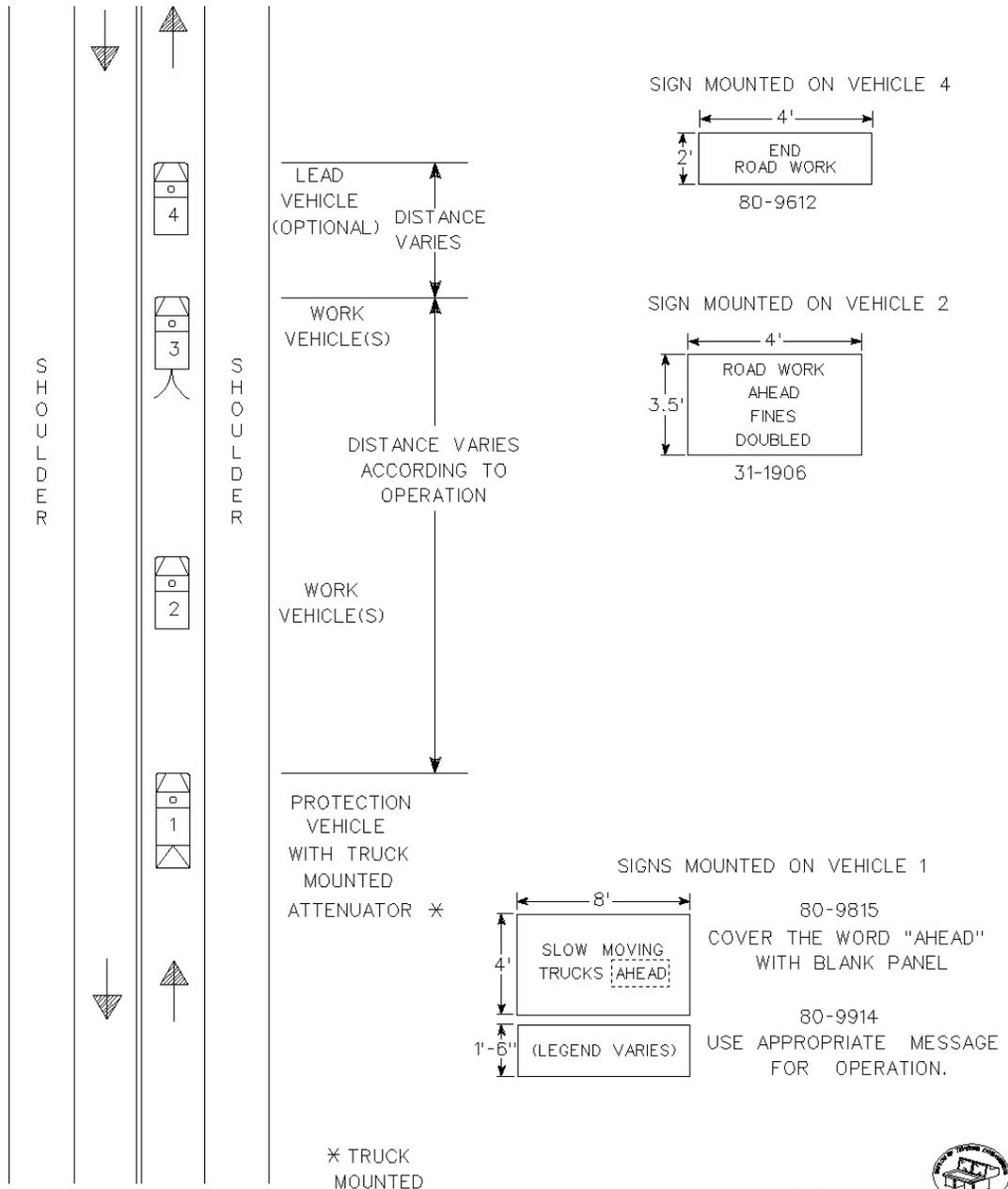


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MAINTENANCE
TRAFFIC CONTROL PLAN
PLAN 23
SCALE NONE

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MOVING OPERATION
TWO LANE HIGHWAY



* TRUCK MOUNTED ATTENUATOR IS OPTIONAL

SEE NOTE 10

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TRAFFIC CONTROL PLAN

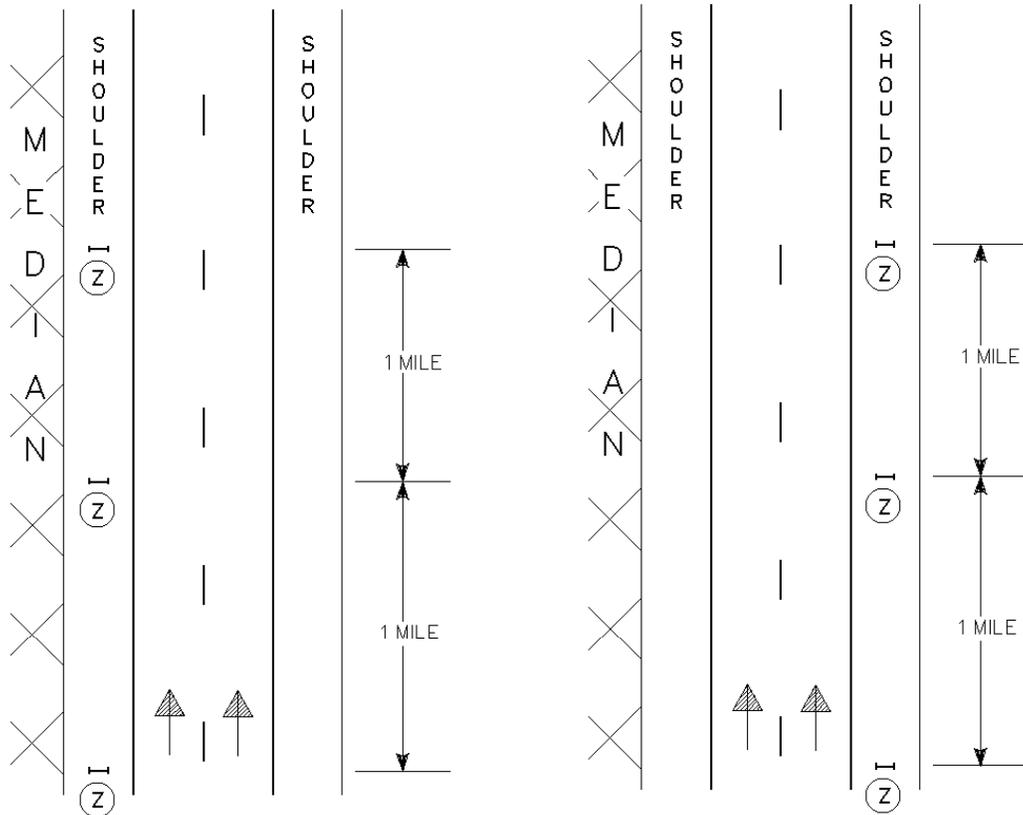
PLAN 24

SCALE NONE

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MOWING OPERATION - MULTILANE HIGHWAY

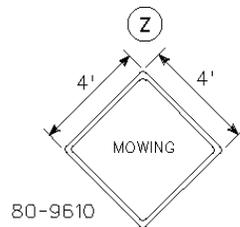
FOR EQUIPMENT ON THE ROADWAY, ROADSIDE
OR ON THE MEDIAN COMPLETELY OFF THE ROADWAY



MOWING IN MEDIAN

MOWING RIGHT OF TRAVELWAY

INSTALL "MOWING" SIGNS ON OPPOSITE TRAVELWAY MEDIAN SHOULDER AS SHOWN ABOVE.



ERECT "MOWING" SIGNS AT 1 MILE INTERVAL AND IMMEDIATELY BEYOND THE ENTRANCE RAMP.

WHEN MOWING FROM A TRAVEL LANE, USE BACK UP VEHICLES 1, 2 & 3 AS SHOWN ON PLANS 20 & 21 TO PROTECT MOWING OPERATIONS. WHEN MOWING EQUIPMENT MUST USE THE TRAVELWAY TO GET AROUND AN OBSTACLE, USE BACKUP VEHICLES 2 & 3 ONLY. THE BACKUP VEHICLES MUST REMAIN OFF THE ROADWAY UNTIL MOWING EQUIPMENT IS READY TO GET OUT ONTO THE TRAVELWAY. THE DISTANCE BETWEEN VEHICLE 3 AND THE MOWING EQUIPMENT IS TO BE 200 FEET.

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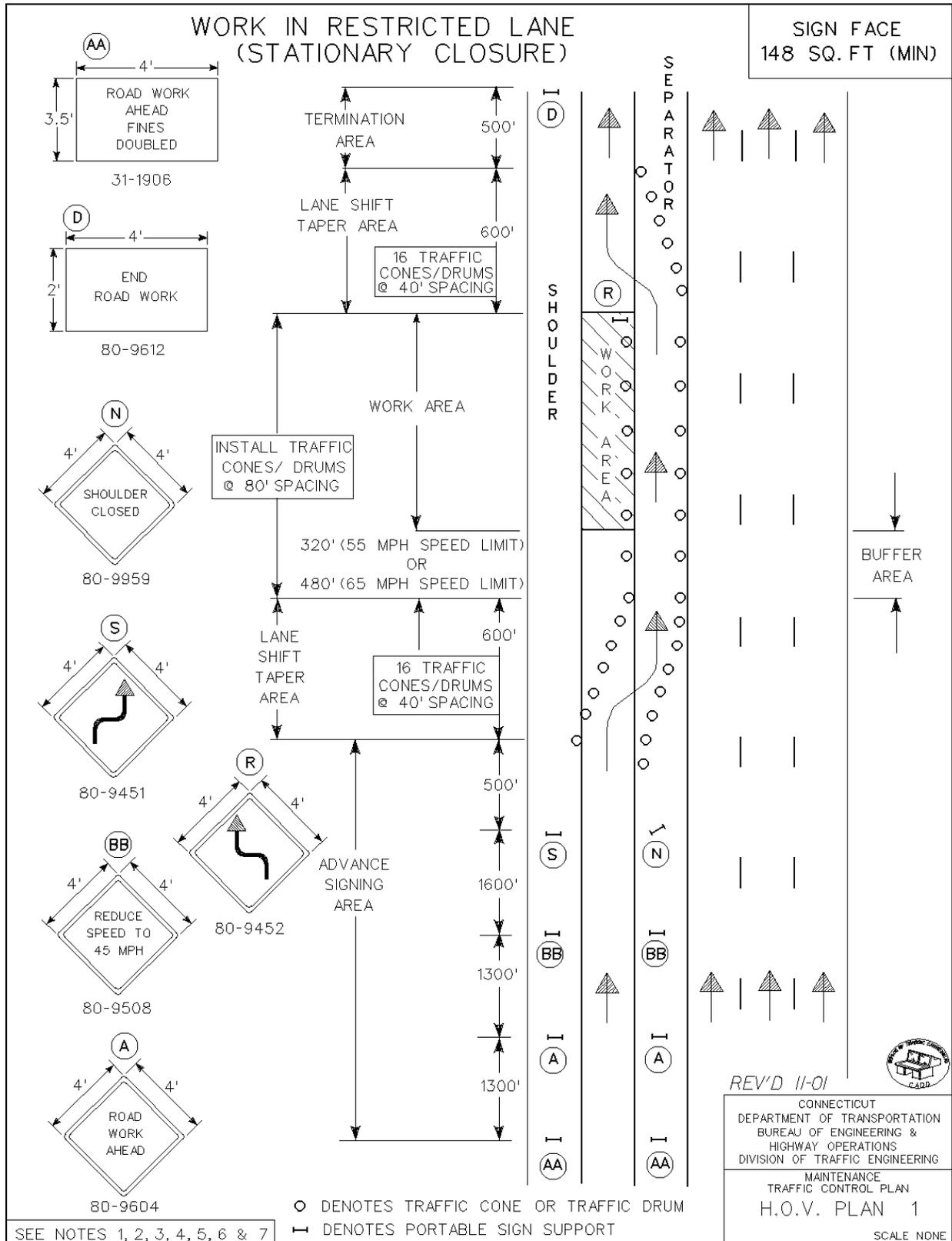
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MAINTENANCE
TRAFFIC CONTROL PLAN

PLAN 25

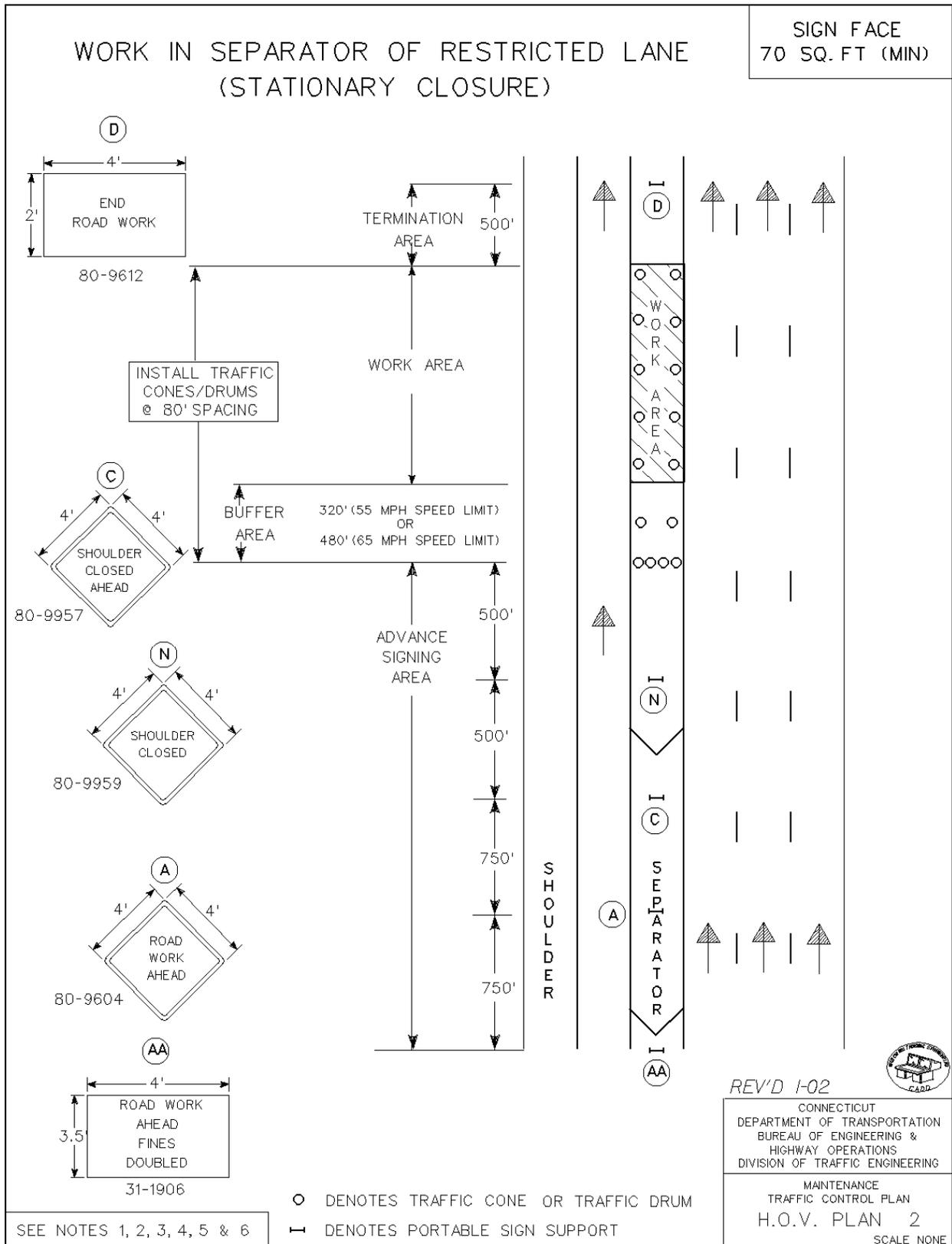
SCALE NONE

12PSX0242 EXHIBIT A1

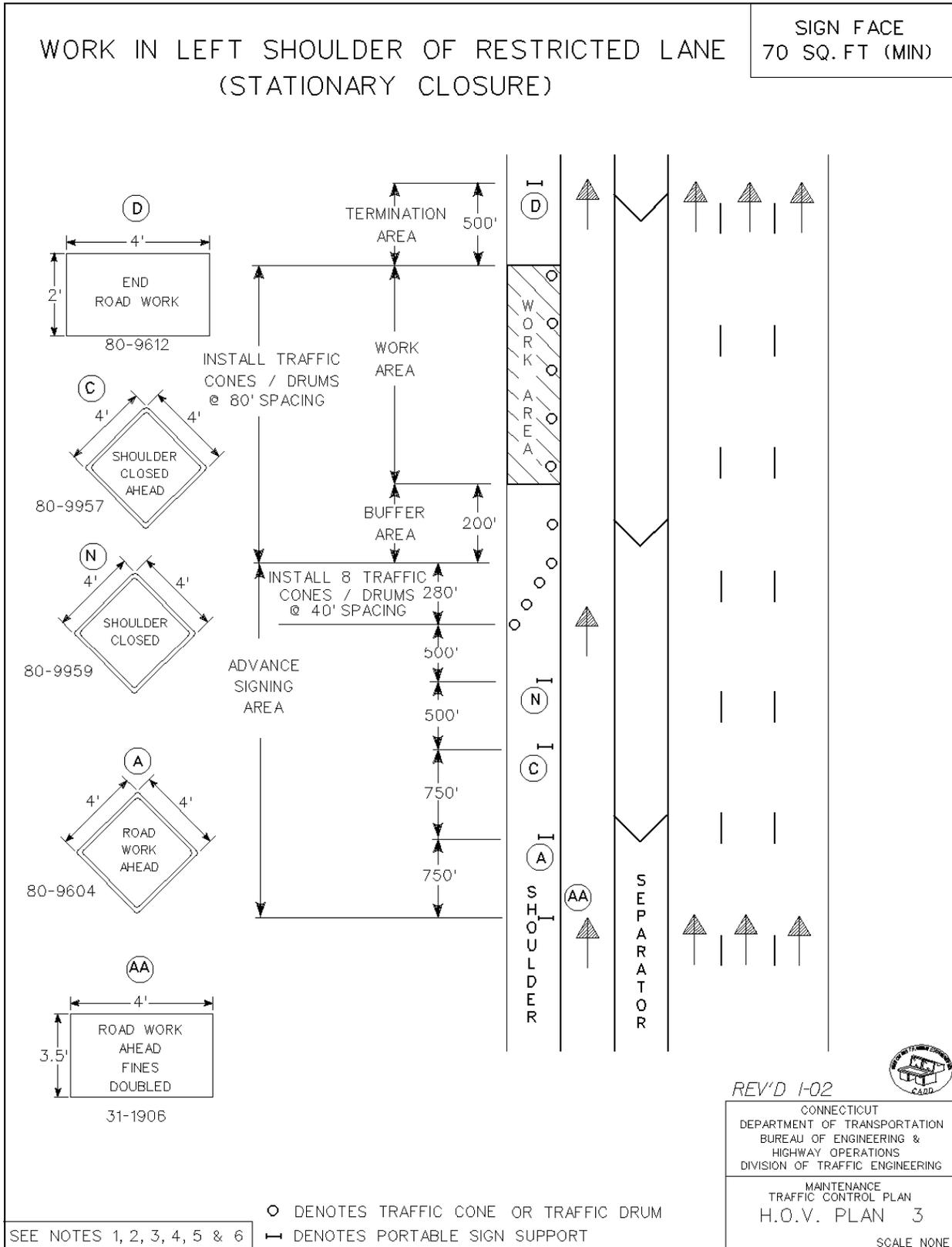


SEE NOTES 1, 2, 3, 4, 5, 6 & 7

12PSX0242 EXHIBIT A1

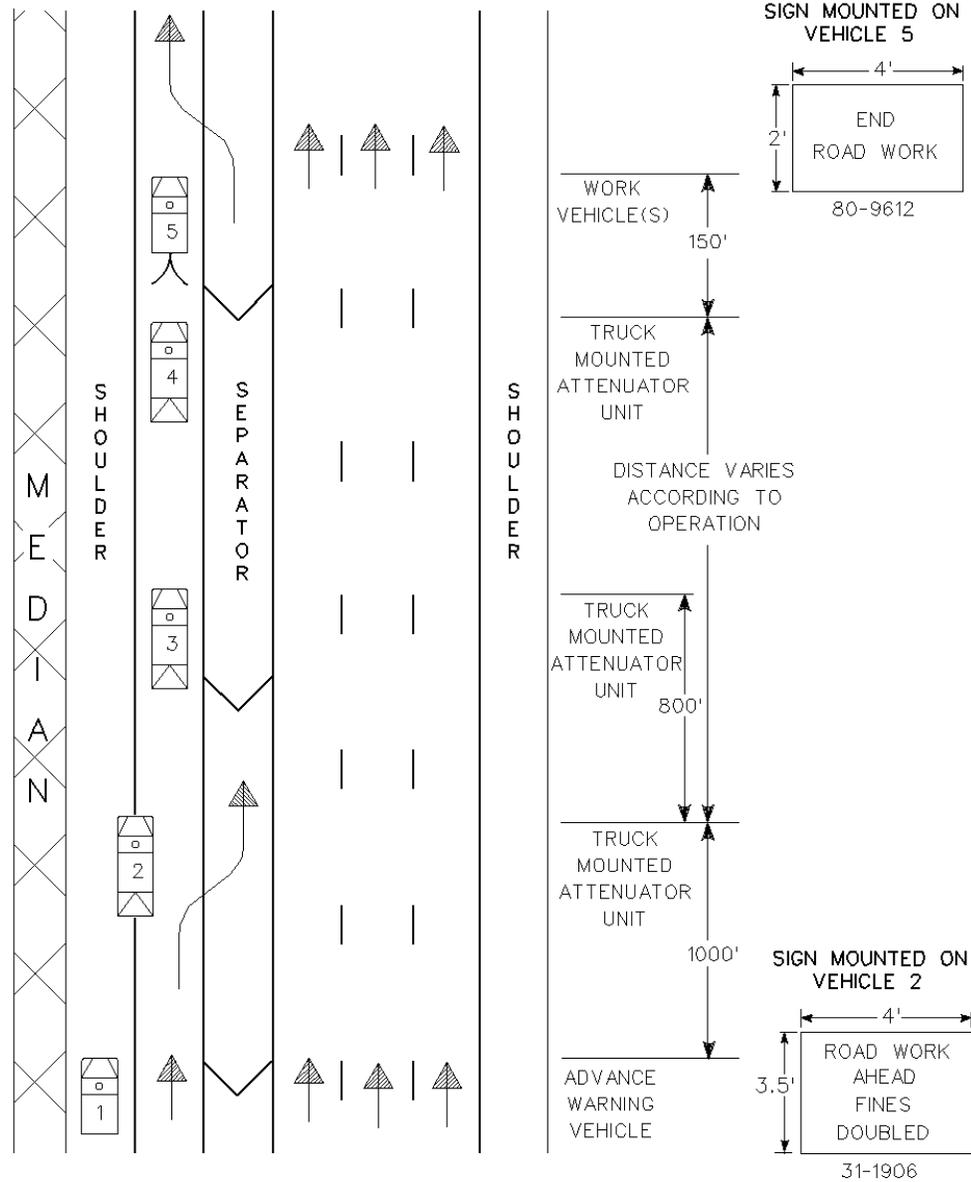


12PSX0242 EXHIBIT A1



12PSX0242 EXHIBIT A1

MOVING OPERATION IN RESTRICTED LANE



SIGNS MOUNTED ON VEHICLE 1

80-9815
THIS SIGN SHOULD BE COVERED WHEN NOT IN USE.

80-9914
USE APPROPRIATE MESSAGE FOR OPERATION.

SIGN MOUNTED ON TRUCKS 2, 3, & 4

DEPARTMENT APPROVED
ARROW BOARD

REV'D 11-01

CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

MAINTENANCE
TRAFFIC CONTROL PLAN
H.O.V. PLAN 4

SCALE NONE