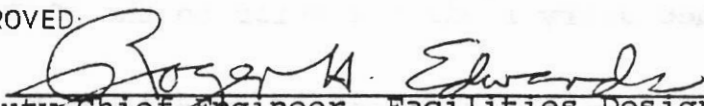


TO:  <b>MODIFIED BY EI 78-039</b> <b>EFFECTIVE 7/17/1978; EI 78-056</b> <b>EFFECTIVE 1/11/1979; EI 80-032</b> <b>EFFECTIVE 1/8/1981; EI 81-046</b> <b>EFFECTIVE 3/4/1982</b>	<h1>ENGINEERING INSTRUCTION</h1> <p>NEW YORK STATE DEPARTMENT OF TRANSPORTATION</p>
Distribution: <input checked="" type="checkbox"/> Main Office <input type="checkbox"/> Regions <input type="checkbox"/> Special	Code: <u>EI 77-57</u>
APPROVED:  Deputy Chief Engineer, Facilities Design Subdivision	Date: <u>12/23/77</u>  Supersedes: MODIFIES EI 77-023 DATE 5/13/77

Provisions for temporary barriers and barricades during construction have been handled largely on a project-by-project basis because no firm guidelines exist for when to use the various types. In some instances, this has led to specifying the use of barriers when delineation alone would suffice. In other instances not enough positive protection was provided. In some instances, agreement on the method to be used was not obtained until PS&E was submitted to FHWA for authorization to take bids.

In recognition of the need for criteria that apply on a general basis, and at the urging of FHWA, we are developing guidelines with the expectation that they will be issued in the near future. Until they are issued, the following Special Note and Standard Sheets have been prepared for your use.

Attached hereto:

- 1) Special Note "Maintenance and Protection of Traffic, Temporary Box Beam Barrier and Temporary Concrete Barrier."
- 2) Special Spec. Item 16619.14, 12" x 24" Timber Barrier System for Structures.

To be transmitted under separate cover:

- 3) Standard Sheet 619-3, Temporary Concrete Barrier.
- 4) Standard Sheet 619-4, Typical Type III Breakaway Barricade.

Pending development of firm guidelines, the appropriate method to be used will have to be determined on a project-by-project basis as has been done in the past. For the present, I am directing that the following be implemented.

1. Final Plan Review Bureau will review the maintenance and protection of traffic plan and obtain FHWA approval for all projects scheduled for letting between now and April 13, 1978.

Subject: STANDARDS & SPECIFICATIONS FOR CONSTRUCTION BARRIERS  
AND BARRICADES

2. For all other projects, Regional Design and the Design Bureau will submit four complete sets of maintenance and protection of traffic plans, notes, sign locations, etc. to the Preliminary Plan Review Bureau. This submission should preferably be made with the advanced detail plans. However, if timing does not allow this, the maintenance of traffic plans must be submitted separately as soon as possible but no later than three weeks prior to submission of PS&E. The Preliminary Plan Review Bureau will review each M&PT plan with appropriate Main Office units and FHWA and advise Regional Design or the Design Bureau of any necessary revisions prior to the PS&E date.

Eventually I hope to develop a comprehensive set of guidelines to assist designers in deciding on the appropriate measures and devices to be included under Maintenance and Protection of Traffic. When this is done, we will no longer require this special submission. Any necessary review of maintenance and protection of traffic plans will be covered under the normal review of advance detail plans and PS&E.

RHE:RKR:BS

Attachment (1 & 2)  
Separate Cover (3 & 4)

MAINTENANCE AND PROTECTION OF TRAFFIC  
TEMPORARY BOX BEAM BARRIER, AND TEMPORARY CONCRETE BARRIER

On Pages 391 through 406 of the Standard Specifications of January 2, 1973 and Pages 89 through 106 of Addendum #3 to the Standard Specifications make the following revisions:

619-1.03 Delete this Subsection and substitute the following:

"619-1.03 Construction Signs, Temporary Box Beam Barrier, Temporary Concrete Barrier, Construction Barricades, and Lighting for Construction Barricades. The Contractor shall furnish, install, move, and maintain construction signs, temporary box beam barrier, temporary concrete barrier, construction barricades, and lighting for construction barricades as shown on the plans or as ordered by the Engineer, and in accordance with the New York State Manual of Uniform Traffic Control Devices."

619-2.02 Delete this Subsection and substitute the following:

619-2.02 Construction Signs and Other Signs. Sign panels may be made of aluminum, galvanized steel or plywood except when placed on Type III Breakaway Barricades, ~~then~~ sign material shall conform to the requirements for the aluminum panels. When reflectorization is required by the N.Y.S.M.U.T.C.D. reflective sheet material shall be used and it shall conform to the photometric and color requirements of material specifications as follows:

For signs that are exclusively used during daylight hours, 730-05.01 Reflective Sheeting (Class A) or 730-05.02 Reflective Sheeting (Class B) may be used at the Contractor's option.

For signs that are used during daylight and/or night hours, 730-05.02 Reflective Sheeting (Class B) shall be used.

When reflectorization is not required, the sign face background shall be any one of the following: 730-05.01, Reflective Sheeting (Class A), 730-05.02, Reflective sheeting (Class B); or exterior type paint conforming to the appropriate Highway Color Tolerance Chart PR Colors No. 1 through No. 6.

Black characters shall be non-reflective, Type V, and shall conform to the requirements of Subsection 730-13, Reflectorized Sheeting Sign Characters (Type V), except that reflective background material shall meet the requirements stated above.

White characters shall meet the requirements of either Subsection 730-12, Reflectorized Sheeting Sign Characters (Type IV) or Subsection 730-13, Reflectorized Sheeting Sign Characters (Type V), except that type IV characters shall consist of cutout reflective sheeting material meeting the requirements of cutout reflective sheeting material meeting the requirements of Subsection 730-05.02, Reflective Sheeting (Class B) and reflective background materials shall meet the requirements stated above.

619-2.03 Delete this subsection and substitute the following:

"619-2.03 Delineators, Temporary Box Beam Barrier, Temporary Concrete Barrier, Construction Barricades, Lighting for Construction Barricades, and Pavement Delineation. Delineators, barricades, lighting for construction barricades, pavement delineation and similar materials shall meet the requirements of these specifications and shall be in accordance with the plans, applicable Standard Sheets and the New York State Manual of Uniform Traffic Control Devices. No materials or methods which will cause damage to any pavement or paving course that will be retained shall be employed in the removal of the pavement markings.

Temporary box beam barrier shall meet the requirements of box beam median barrier as specified in Subsection 710-21 Box Beam Guide Railing and Median Barrier. After the removal of the barrier, the pavement repairs shall be made in accordance with the applicable requirements of Section 401 BITUMINOUS PAVEMENTS or Section 502 PORTLAND CEMENT CONCRETE PAVEMENT.

Temporary concrete barriers shall be fabricated from air entrained Portland Cement Concrete with a minimum compressive strength of 3000 PSI. The Contractor may fabricate the barrier units utilizing the details shown on the Standard Sheet titled "Temporary Concrete Barrier" or he may propose the use of alternate methods of coupling the barrier units, anchoring the barrier to grade, and/or reinforcing the section. In the event he proposes an alternate for the coupling, anchoring or reinforcing, he must prepare design drawings and submit them for approval to the Deputy Chief Engineer (Facilities Design). Under no circumstances shall the cross sectional dimensions shown on the standard sheet be varied.

Approved Temporary Concrete Barrier Units shall bear an approval mark on each end. This mark shall be cast into the concrete and contain the following information:

Approved by N.Y.S.D.O.T.  
on DATE  
CONTRACT NO.

Any barrier unit not so marked may not be used unless the Contractor can produce evidence that the barrier units have been previously approved and he shall certify that the barrier units are the same units as were approved and that no substitutions have been made. When the Contractor so certifies the Department reserves the right to have the Contractor deliver one of the barrier units, picked at random by the Engineer, to a location selected by the Department for testing. If this unit fails, the contractor shall remove the entire lot and replace it with one which will meet with approval. Units approved for use in other states may be used if:

1. The specifications and details meet with the approval of the Deputy Chief Engineer (Facilities Design).
2. The units are individually marked showing approval, or the Contractor submits evidence that these are in fact approved units and is willing to submit one of the units to testing to determine if they are acceptable.

The design drawings shall be submitted in the same manner and form as required for shop drawings in Section 102.2 and 102.3 of the "New York State Steel Construction Manual.

When reflectorization is required by the New York State Manual of Uniform Traffic Control Devices, reflective sheet material shall be used and it shall conform to photometric and color requirements of Subsection 730-05.02 Reflective Sheeting (Class B) except where glass or plastic buttons are used as delineators. Construction barricades, cones, and drums may be reflectorized with reflective sheeting conforming to the requirements of Subsection 730-05.01 Reflective Sheeting (Class A).

When reflectorization is not required, any paints utilized shall be of an exterior type conforming to the appropriate Highway Color Tolerance Chart PR Colors No. 1 through No. 6.

These requirements must be maintained throughout the period of the Contract with repair or replacement made by the Contractor as necessary.

Pavement delineation shall consist of reflectorized paint or reflectorized pressure sensitive tape that is specifically designed for use on pavements. If paint is used, the materials, including glass beads, shall conform to the material requirements of Section 640 - REFLECTORIZED PAVEMENT MARKING PAINTS of the Specifications. If tape is used, it shall be of a type that will adhere to the surface to which it is applied. It shall be thin, flexible and capable of conforming to the texture of the surface of the pavement to which it is applied, including base, binder and top courses of asphalt concrete. The line segment shall be not less than four nor more than six inches in width and the color shall be as specified in the New York State Manual of Uniform Traffic Control Devices."

"619-3.03 Change the title of this Subsection to "619-3.03, Temporary Box Beam Barrier, Temporary Concrete Barrier, Construction Barricade, and Lighting for Construction Barricades."

Delete the first and second paragraphs and substitute the following:

"The contractor shall furnish, erect, move and remove, temporary concrete barrier, construction barricades and lighting for construction barricades where and as indicated on the plans, on the Standard Sheets, in the New York State Manual of Uniform Traffic Control Devices, or as directed by the Engineer. Posts and painted members or bands used to delineate drop-offs will not be considered to be barricades.

Where indicated on the plans or in the proposal, construction barricades shall be supplemented either by approved flashing or steady burning lights.

Temporary box beam barrier shall be erected in accordance with the requirements for box beam median barrier specified in Subsection 606-3.01 and 606-3.03.

Each run, or bay, of temporary concrete barrier units shall be fastened together to form a continuous chain. The units ~~at~~ each end of a run, or bay, as well as certain intermediate units shall be anchored as shown on the Standard Sheet to prevent any movement in the run, or bay. The distance between anchored units shall not exceed 120' (one hundred and twenty feet). However, a lesser distance may be required if shown on the plans. Where shown on the plans or directed by the Engineer, tapered end sections shall be installed on the ends of the barrier run."

619-4.03 Delete this Subsection and substitute the following:

"619-4.03, Temporary Box Beam Barrier, and Temporary Concrete Barriers. The quantity of temporary box beam barrier, and temporary concrete barrier shall be computed by the number of linear feet placed in accordance with the contract documents and/or direction of the Engineer. Temporary box beam barrier shall be measured in accordance with the requirements of 606-4.01. Temporary concrete Barrier shall be measured along the centerline of the uppermost surface."

619-5.02 Delete this Subsection and substitute the following:

"619-5.02 Construction Signs. The lump sum bid shall include all material, equipment and labor necessary to erect, remove, relocate, protect, maintain, store or replace any construction signs required to properly sign the contract. The lump sum bid shall also include the repair or replacement of reflectorized signs when the Engineer determines the reflective sheeting no longer conforms to the material specifications. This item is to cover payment for all signs which are determined by the Engineer to be necessary for the proper performance of the work, regardless of whether or not they are actually shown in the contract plans.

Payment will be made at the lump sum price bid as follows:

Fifty (50) percent of the lump sum price will be paid when ten (10) percent of the contract work has been completed. The remaining fifty (50) percent will be paid proportionally in accordance with the total contract work completed, beginning with the estimate following the initial payment on this item."

619-5.03 Delete this Subsection and substitute the following:

"619-5.03, Temporary Box Beam Barrier, and Temporary Concrete Barrier. The unit price bid per linear foot of temporary box beam barrier, and temporary concrete barrier shall include all material, equipment, and labor necessary to erect, maintain, and remove the required barrier, including any required connection devices, end treatments, delineation or guiding devices, repairing pavement after removal of box beam barriers, and devices for pinning and connecting temporary precast concrete barrier units. Any movement of temporary box beam barrier or temporary concrete barrier, except movements of the concrete barrier necessary to maintain, realign, or replace damaged units will be considered as a movement to a new location and the Contractor will be entitled to payment for the movement.

After placement, payment will be made for ninety (90) percent of the quantity of temporary box beam barrier, or temporary concrete barrier furnished and erected in accordance with the contract requirements. The remaining ten (10) percent will be paid upon removal."

619-5.04 Delete this Subsection and substitute the following:

"619-5.04 Construction Barricades. The unit price bid per linear foot of barricade shall include all material, equipment and labor necessary to erect, maintain and remove required barricades. Whenever barricades are moved to a new location or the diagonal stripes are changed to allow traffic to pass on the other side of the barricade, payment will be made in the same manner as if it were a new barricade. Minor movements of the barricade from one side of the roadway to the other side or rearrangement within a work area, not requiring any change in the diagonal stripes, will not be considered as movement to a new location and will not entitle the Contractor to additional payment.

After placement, payment will be made for ninety (90) percent of the quantity of barricade furnished and erected in accordance with the contract requirements. The remaining ten (10) percent will be paid upon removal."

Under the list of payment items add the following:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
619.0411	Type I Construction Barricade	Linear Foot
619.0413	Type III Construction Barricade	Linear Foot
619.17	Temporary Concrete Barrier	Linear Foot
619.18	Temporary Box Beam Barrier	Linear Foot

Under the list of payment items delete the following:

619.0401	Construction Barricades	Linear Foot
619.14	Timber Curbs (12" x 12" or Larger)	Linear Foot

16619.14 12" x 24" TIMBER BARRIER SYSTEM FOR STRUCTURES

Description. This work shall consist of furnishing, placing, maintaining, and removing temporary timber barrier systems for structures as shown on the plans, or as directed by the Engineer.

Materials. 12" x 24" Timber Barrier System for structures shall be made from two 12" x 12" rough cut timbers which are free from cracks, splits, or excessive knots and have a minimum length of 12 feet. All other materials shall comply with the requirements of the following specifications:

Concrete Grouting Material	701-05
Bolts, Nuts, and Washers for	
Splice Plates and Anchors	ASTM A 307
Splice Plates	ASTM A 36

The temporary timber barrier systems for structures shall be painted white or yellow in accordance with the New York State Department of Transportation Manual of Uniform Traffic Control Devices.

Any delineator posts required are to be frangible. Upright wood posts spiked to the barrier will not be allowed.

Construction Details. The Contractor shall furnish, install, and remove 12" x 24" Timber Barrier System for Structures as indicated on the plans or directed by the Engineer.

The temporary timber barrier shall be securely fastened to the structural slab by bolts extending through the structural slab as shown on the plans or directed by the engineer. Holes made in a structural slab, which is to remain in place, shall be drilled with a core drill. Holes made in a structural slab, which is to be removed, shall be made by any method acceptable to the Engineer.

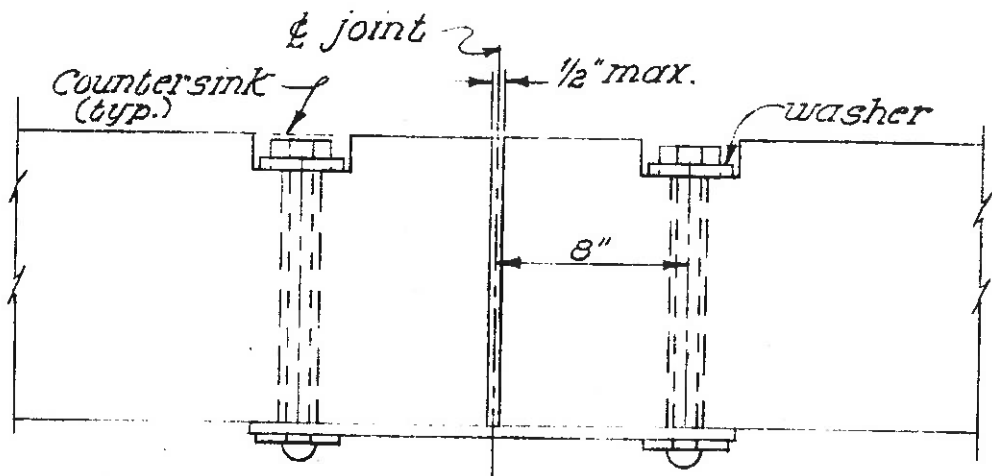
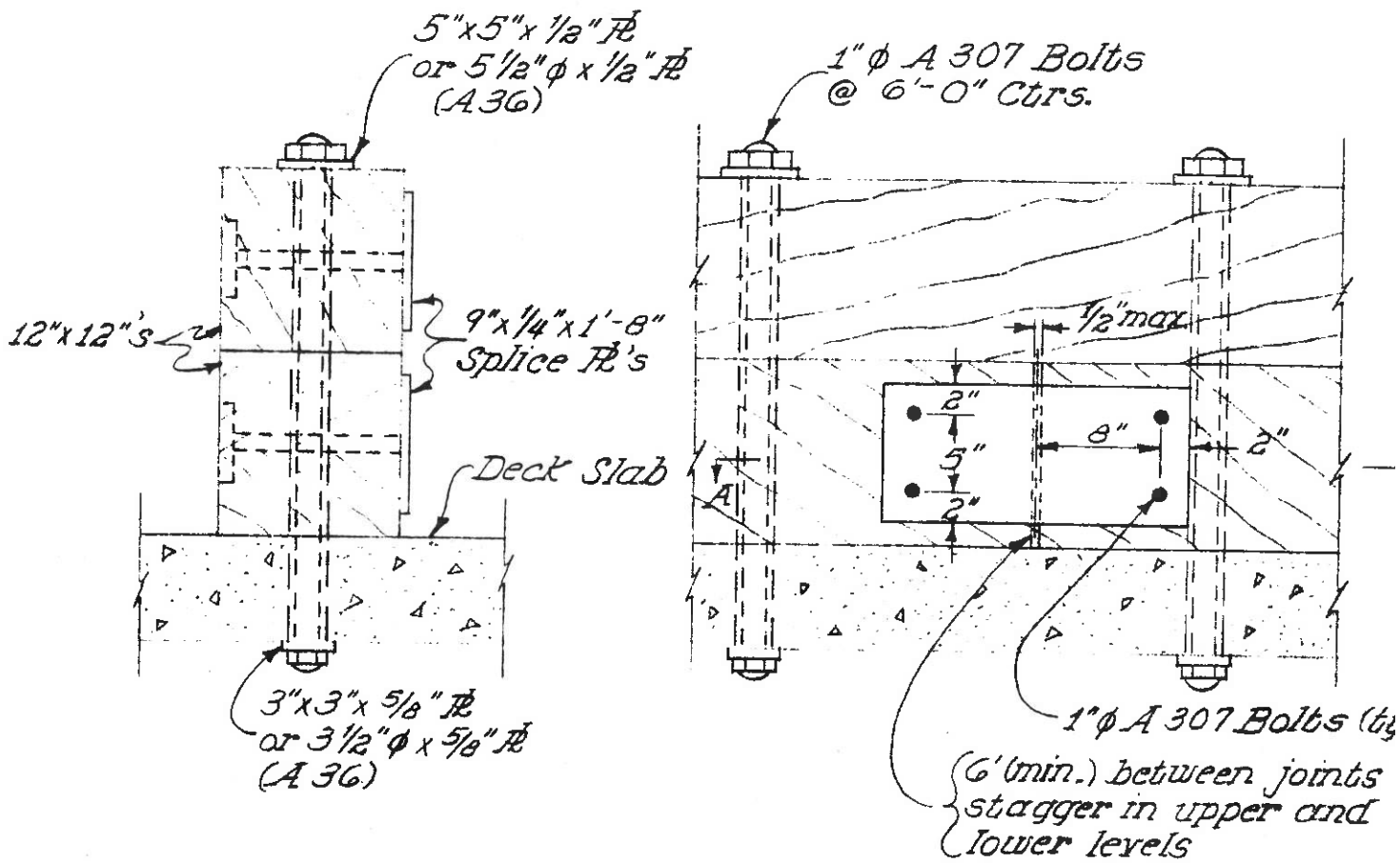
All holes left in the final finished concrete surfaces or in the structural deck as a result of anchoring the timber barrier shall be filled with concrete grouting material in a manner approved by the Engineer. All holes shall be thoroughly cleaned and dried immediately prior to the addition of concrete grouting material.

Method of Measurement. The quantity of 12" x 24" Timber Barrier System for Structures shall be computed by the number of linear feet placed in accordance with the contract documents and/or directions of the Engineer.

Basis of Payment. The unit price bid per linear foot shall include all material, equipment and labor necessary to erect, maintain and remove 12" x 24" Timber Barrier System for Structures, including any required delineation or guiding device attached, and any required connections or anchorage devices. Any movement of the 12" x 24" Timber Barrier, except movements necessary to maintain, realign, or replace damaged portions will be considered as a movement to a new location and the Contractor will be entitled to payment for the movement as if it were a new installation.

After placement, payment will be made for ninety (90) percent of the quantity of 12" x 24" Timber Barrier System for Structures, the remaining ten (10) percent will be paid upon removal. Removal shall include all necessary structural concrete repairs and payment for removal will not be made until this work is completed to the satisfaction of the Engineer.

6/1/77



Section A-A

TIMBER BARRICADE SYSTEM FOR STRUCTURES

MEMORANDUM  
DEPARTMENT OF TRANSPORTATION

DATE February 14, 1978

SUBJECT ENGINEERING INSTRUCTION 77-57  
USE OF POSITIVE BARRIER SYSTEMS DURING CONSTRUCTION

FROM R. K. Radliff, Preliminary Plan Review Bur., Rm. 408, Bldg. 5 *RKR*

TO All Regional Design Engineers, Region \_\_\_\_\_

cc R. H. Edwards, Rm. 405, Bldg. 5 (w/copy 10/25/77 FHWA memo)  
M. Tegza, Rm. 410, Bldg. 5 " " "  
J. M. Yourno, Rm. 308, Bldg. 5 " " "

As stated in EI 77-57, we are developing criteria and guidelines for the use of temporary barriers and barricades during construction. The primary focus is on determining under what conditions positive barrier will be required. We expect these criteria will be issued soon.

Of immediate concern, however, is the "overuse" of positive barriers which has caused a significant cost increase on several projects. Until the final criteria are issued, I suggest that as you develop a maintenance and protection of traffic plan, you be guided by the points outlined in the attached FHWA memorandum.

RKR:BS  
Attachment

## Memorandum

File

DATE: October 25, 1977

In reply  
refer to: HD-NYSUBJECT: Use of Temporary Safety Shape Concrete  
Positive Barrier SystemsFROM : Frank H. Platt  
District Engineer  
Thru: A.J. Horner, Assistant  
Division Administrator  
TO : Districts A, B, C & D

On October 19, 1977 Messrs Malcolm Graham, Dan Egan, Vic Taylor, Tony Horner, and Frank Platt discussed the possibility that everyone may have overreacted and we may be requiring more positive barrier length than actually needed on long detours where two way traffic is using one barrel of a divided highway.

We said that our policy as stated in our March 8, 1977 memo has not changed.

"Where a positive barrier is deemed necessary, a temporary box beam or concrete barrier will be utilized. The necessity to use a positive barrier will be determined on a project-by-project basis and will depend on speeds, duration of time in effect, field conditions and etc."

The "problem area" is making the decision where a positive barrier is deemed necessary. We all agreed that through most transition areas where turning traffic is changing roadways, a positive barrier system would be needed. Before and after these transition areas in sections of the detour where the two way traffic is under controlled conditions proper delineation rather than a positive barrier system may be preferable. Proper delineation would consist of adequate reduced speed limit, no passing and construction signs, a double yellow stripe down the centerline plus adequate (size, height, and number) reflectorized delineators. The important thing is to continually remind the drivers of the constricted conditions and no passing will be allowed.

Each project must be thoroughly analyzed before making an intelligent choice between using a positive barrier or a delineation system. NYDOT will continue to study this whole problem area and try to develop some guidelines as an aid in determining when a positive barrier is needed.

File - Original  
Districts A, B, C, & D  
District D (DF)  
Reading File

FHPlatt/bag 10/25/77