



U.S. Department of Transportation
Federal Highway Administration

400 Seventh St. SW.
Washington, D.C. 20590

Refer to: HMHS

October 19, 1999

Mr. Leo Yodock
1517 S.W. 17th Street
Ft. Lauderdale, FL 333 12

Dear Mr. Yodock:

Thank you for your letter of August 2, 1999, requesting Federal Highway Administration acceptance of the "Yodock 2001m Barrier with T3m apparatus" as a crashworthy Type III barricade for use in work zones on the National Highway System. Accompanying your letter was a copy of the crash test report by Exponent, Inc., and video documentation of the crash test. You requested that we find the tested device acceptable for use on the National Highway System under the provisions of National Cooperative Highway Research Program Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled "Information: Identifying Acceptable Highway Safety Features," established four categories of work zone devices: Category I devices were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. The second guidance memorandum was issued on August 28, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This recent memorandum lists devices that are acceptable under Categories I, II, and III.

Full-scale automobile testing was conducted on your company's Type III barricade. Two examples of the device were tested in tandem, one head-on and the next at 90 degrees, as called for in our guidance memoranda. Each barricade consisted of a polyethylene plastic segment with three barricade rails and flashing lights. Each Model 2001m segment had a base 460 mm (18 inches) wide, and was 810 mm (32 inches) tall. Inserted at the top of each segment were two poles for the top "T3m" apparatus consisting of the barricade rails and the warning lights. One barricade rail is mounted on the face of the barrier segment while the two upper rails are affixed to the poles. The complete devices as tested are shown in the Enclosure 1. The mass of the 2001m segment itself was 36 kg, with the mass increasing to 55 kg with the addition of the T3m apparatus. Although the Yodock 2001m segments are made to hold water, no water was used in this test.

The target speed for a Test Level 3 test is 100 km/hr. The actual impact speed of the test vehicle into the first barricade was 95.3 km/hr. NCHRP Report 350 permits a 4 km/hr tolerance on impact speed. Although the test impact speed was slightly outside this tolerance, observation of

the test results leads us to believe that the results would have been the same had the speed been within the allowable range.

Test Article	Yodock 2001m Type III barricade
Height to Top of Bails	1676 mm
Height to Top of Barrier unit	81 mm
Width of Barrier unit	183mm
Flags or lights	Three lights, mass of 1.9 kg each
Test Article Mass (each)	55 kg, including rails and lights
Vehicle Inertial Mass	817 kg
Impact Speed, Head-on	95.3 km/h
Impact Speed, 90 Deg.	90.3 km/h
Velocity Change	1.4 m/s
Vehicle crush	Minimal damage to hood, bumper, lights
Occupant Compart. Intrusion	none
Windshield Damage Head-on	none
Windshield Damage 90 Deg.	none

Upon impact the T3m units separated from the “2001m” plastic base segments and traveled over the roof of the test vehicle. One of the upper panels with lights of the first barricade (head-on hit) separated from the uprights. During the tests the most extensive damage was denting of the bumper and hood, and breakage of lights on the right front of the vehicle. The test article did not contact the windshield. There was no occupant compartment intrusion or deformation observed, nor did any test article debris show potential for penetrating the occupant compartment. The results of this testing met the FHWA requirements and, therefore, the devices listed in Enclosure 1 are acceptable for use on the National Highway System under the range of conditions tested, when proposed by a state. Per your request, the “Yodock 200 1m” device may also be used without the T3m apparatus as a channelizing device.

Our acceptance is limited to the crashworthiness characteristics of the device as a barricade channelizing device, not as a barrier, and does not cover its structural features nor conformity

with the Manual on Uniform Traffic Control Devices. Presumably, you will supply potential users with sufficient information on design and installation requirements to ensure proper performance. We anticipate that the States will require certification from Yodock Wall Company that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance. To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-22, shall not be reproduced except in full.

Parts of the Yodock 2001m Type III barricade are patented and are considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are selected by the contractor for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are specified for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing **highway** facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

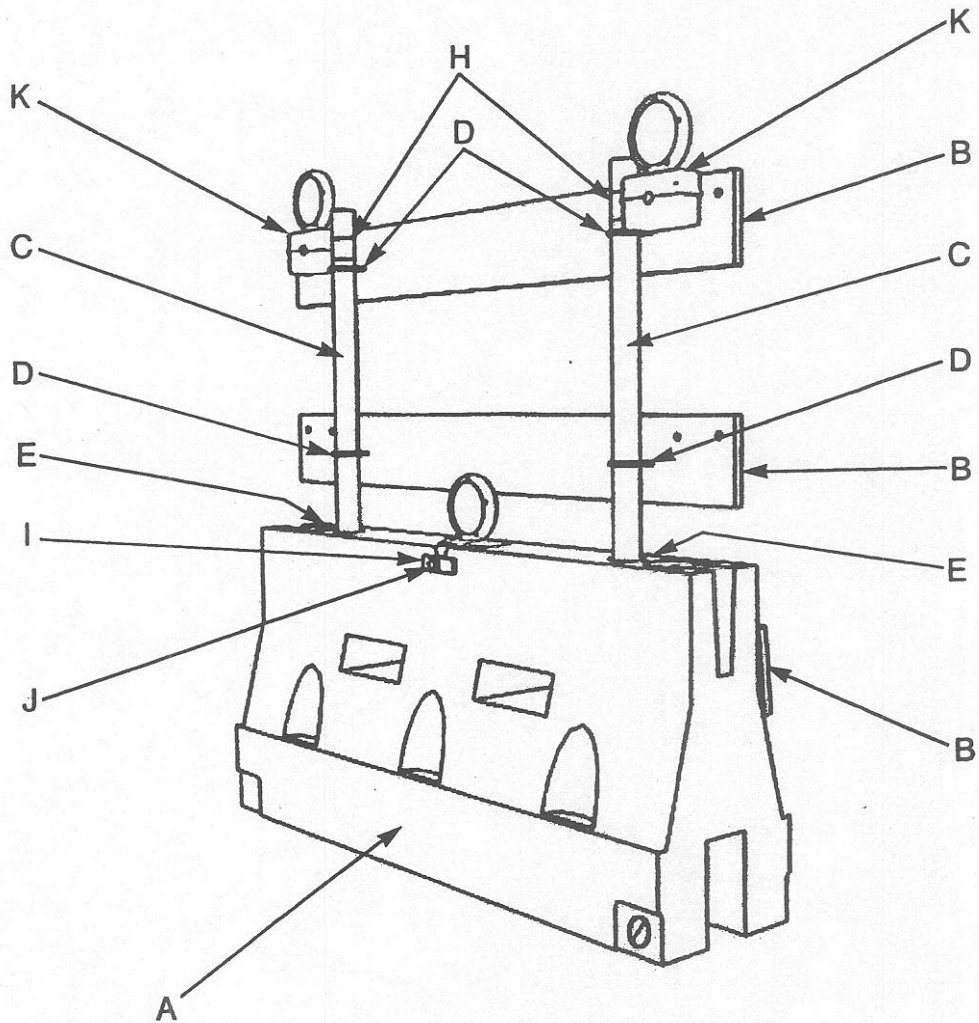
Sincerely yours,



Dwight A. Horne
Director, Office of Highway Safety
Infrastructure

FHWA:HMHS:NArtimovich:jb:61795:10/13/99
cc: Reader - HMHS, Chron - File HMHS

T3m PARTS LIST



BACK VIEW

- A - Yodock Barrier model 2001m
- B - Horizontal barricade panel
- C - 2" schedule 80 PVC posts
- D - U-bolt with bracket and nuts
- E - Rubber post stabilizer
- G - Standard bolt for barricade light
(Optional Parts used for lights)
- H - Aluminum P bracket
- I - Steel lightbox bracket
- J - 5.5" barricade light bolt
- K - Barricade light

the request. The RFHWA will have approval authority on the request.

(3) Requests for waivers may be made for specific projects, or for certain materials or products in specific geographic areas, or for combinations of both, depending on the circumstances.

(4) The denial of the request by the RFHWA may be appealed by the State to the Federal Highway Administrator (Administrator), whose action on the request shall be considered administratively final.

(5) A request for a waiver which involves nationwide public interest or availability issues or more than one FHWA region may be submitted by the RFHWA to the Administrator for action.

(6) A request for waiver and an appeal from a denial of a request must include facts and justification to support the granting of the waiver. The FHWA response to a request or appeal will be in writing and made available to the public upon request. Any request for a nationwide waiver and FHWA's action on such a request may be published in the FEDERAL REGISTER for public comment.

(7) In determining whether the waivers described in paragraph (c)(1) of this section will be granted, the FHWA will consider all appropriate factors including, but not limited to, cost, administrative burden, and delay that would be imposed if the provision were not waived.

(d) Standard State and Federal-aid contract procedures may be used to assure compliance with the requirements of this section.

[48 FR 53104, Nov. 25, 1983, as amended at 49 FR 18821, May 3, 1984; 58 FR 38975, July 21, 1993]

EDITORIAL NOTE: For a waiver document affecting § 635.410, see 60 FR 15478, Mar. 24, 1995.

§ 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through com-

petitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

§ 635.413 Warranty clauses.

The SHA may include warranty provisions in National Highway System (NHS) construction contracts in accordance with the following:

(a) Warranty provisions shall be for a specific construction product or feature. Items of maintenance not eligible for Federal participation shall not be covered.

(b) All warranty requirements and subsequent revisions shall be submitted to the Division Administrator for advance approval.

(c) No warranty requirement shall be approved which, in the judgment of the Division Administrator, may place an undue obligation on the contractor for items over which the contractor has no control.

(d) A SHA may follow its own procedures regarding the inclusion of war-

ranty provisions in non-NHS Federal-aid contracts.

[60 FR 44274, Aug. 25, 1995]

§ 635.417 Convict produced materials.

(a) Materials produced after July 1, 1991, by convict labor may only be incorporated in a Federal-aid highway construction project if such materials have been:

(1) Produced by convicts who are on parole, supervised release, or probation from a prison or

(2) Produced in a qualified prison facility and the cumulative annual production amount of such materials for use in Federal-aid highway construction does not exceed the amount of such materials produced in such facility for use in Federal-aid highway construction during the 12-month period ending July 1, 1987.

(b) *Qualified prison facility* means any prison facility in which convicts, during the 12-month period ending July 1, 1987, produced materials for use in Federal-aid highway construction projects.

[53 FR 1923, Jan. 25, 1988, as amended at 58 FR 38975, July 21, 1993]

APPENDIX A TO SUBPART D—SUMMARY OF ACCEPTABLE CRITERIA FOR SPECIFYING TYPES OF CULVERT PIPES

Type of drainage installation	Alternatives required			AASHTO designations to be included with alternatives	Application	Remarks
	Yes	No	Number			
Cross drains under high-type pavement. ¹		X			Statewide	Any AASHTO-approved material. ²
Other cross-drain installations.	X		3 minimum	M-170 and M-190.	do	Do. ²
Side-drain installations	X		do	M-36	Individual installation.	Specified to meet special conditions.
Special installation conditions.		X			do	Specified to meet site requirements.
Special drainage systems (storm sewers, inverted siphons, etc.).		X			do	

¹ High-type pavement is generally described as FHWA construction type codes I, J, K, L, and plant mix and penetration macadam segments, respectively shown in the right-hand columns of type codes G and H having a combined thickness of surface and base of 7 in or more (or equivalent) or that are constructed on rigid bases.

² Types not included in currently approved AASHTO specifications may be specified if recommended by the State with adequate justification and approved by FHWA.

Subpart E—Interstate Maintenance Guidelines

SOURCE: 45 FR 20793, Mar. 31, 1980, unless otherwise noted.

§ 635.501 Purpose.

To prescribe Interstate maintenance guidelines and establish the policy and procedures to insure that the condition of Interstate routes is maintained at the level required by the purposes for which they were designed.