J. M. Essex, P.E.
Vice President, Sales
Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, Illinois 60601

Dear Mr. Essex:

Your March 1 letter to Mr. Gerald L. Eller requested the Federal Highway Administration’s (FHWA) acceptance of the Alpha 70K Truck Mounted Attenuator (TMA) as a National Cooperative Highway Research Program (NCHRP) Report 350 test level 2 (TL-2) attenuator. Included with your submission were two test reports entitled "Alpha 70K TMA Crash Test Report" and "Alpha 70K TMA Crash Test Report, Optional Tests" both dated January 1996 and prepared by E-TECH Testing Services, Inc., of Rocklin, California, and two videotapes showing the tests that were conducted.

The Alpha 70K consists of three basic components: an aluminum cartridge with a separate nose assembly, a backup assembly, and a backup support structure. Total weight of the system is approximately 550 kg and its dimensions are as shown on the enclosed drawing. It is intended for use on trucks with gross vehicle weights between 5000 kg and 12000 kg. The supporting truck used in the four compliance tests was a dump truck weighing 8858 kg.

The information provided indicates that the Alpha 70K has been subjected to the appropriate crash tests. A summary of the four tests (NCHRP Tests 2-50, 2-51, 2-52 and 2-53) are enclosed. In all cases, the occupant impact velocities and ride down accelerations were below the maximum allowable values of 12 m/s and 20 g’s, respectively, and all other acceptance criteria were met. Therefore, we consider the Alpha 70K to be acceptable for use as a TL-2 TMA on the National Highway System (NHS) when such use is requested by a highway agency. This acceptance is based on the Alpha 70K crash performance only and does not address the issues of vibration, moisture, or corrosion resistance. Based on the tests you conducted in these areas, each State will be able to make its own determination on the durability of the Alpha 70K.
Since it is a proprietary item, its use on Federal-aid highway projects, except exempt, non-NHS projects, is subject to the conditions set forth in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

A copy of this letter, with enclosures, will be sent to FHWA field offices for information. Any questions concerning FHWA acceptance of the Alpha 70K may be addressed to Mr. Richard Powers of my staff at (202) 366-1320.

Sincerely yours,

Seppo I. Sillan, Acting Chief,
Federal-Aid and Design Division

3 Enclosures

Geometric and Roadside Design Acceptance Letter CC-32
General Information
Test No. .............................................. 183-005
Date .................................................. Dec. 19, 1995

Test Article
Type .................................................. ALPHA 70K TMA
Installation Length, m (ft) ...................... NA
Size and/or dimension and material of key elements ........................ N/A
Soil Type and Condition .......................... NA

Test Vehicle
Type .................................................. Production Model
Designation ........................................ 820C
Model ................................................. Ford Festiva
Mass, kg (lb) ........................................ 818 (1800)
Curb .................................................. 845 (1863)
Dummy(s) .......................................... 75 (165)
Grom Static ........................................ 920 (2028)

Impact conditions
Speed, km/h (mph) .................................. 71.2 (44.2)
Angle (deg) .......................................... 0
Impact Severity, kJ (ft-kips) ...................... 165.3 (121.9)

Exit conditions
Speed, km/h (mph) .................................. NA
Angle, deg .......................................... NA

Occupant Risk Values
Impact Velocity, m/s (fps) ......................... 14.54 (47.86)
x-direction .......................................... 14.54 (47.86)
y-direction .......................................... 11.71 (38.26)
Ride down Acceleration, g's x-direction .............. -13.66
y-direction .......................................... -2.67

Acceleration Severity Index ...................... 1.69
Test Article Deflection, m (ft) .................... NA
Dynamic .............................................. NA
Permanent ........................................... NA

Vehicle Damage
Exterior .............................................. FD-4
Interior .............................................. 12FDEW3
OCDI ................................................ AS0000000

Post-Impact Vehicular Behavior
Maximum Roll Angle, deg ......................... 2.49
Maximum Pitch Angle, deg ....................... 1.76
Maximum Yaw Angle, deg ....................... -13.36
General Information
Test No. ................................................. 183-007
Date ......................................................... Jan. 5, 1996
Test Article
Type ....................................................... ALPHA 70K TMA
Installation Length, m (ft) ................................ NA
Size and/or dimension and material of key elements ................................ N/A
Sell Type and Condition ................................ NA
Test Vehicle
Type ....................................................... Production Model
Designation ............................................. 2000P
Model ...................................................... Ford F-250
Mass, kg (lb) ............................................. 2100 (4620)
Curb ....................................................... 2037 (4481)
Test Inertial ............................................ 2037 (4481)
Dummy(s) ............................................... NA
Gross Static ........................................... 2037 (4481)
Impact Conditions
Speed, km/h (mph) ..................................... 68.3 (42.4)
Angle (deg) ............................................. 0
Impact Severity, kJ (ft-lbs) .............................. 366.1 (270.0)
Exit Conditions
Speed, km/h (mph) ..................................... NA
Angle, deg ............................................... NA
Occupant Risk Values
Impact Velocity, m/s (fps) ............................... 9.00 (29.53)
x-direction .............................................. 0.08 (0.26)
y-direction ............................................... 18.07
Ride-Down Acceleration, g's ................................ /'
x-direction .............................................. -1.91
y-direction ............................................... N/A
Acceleration Severity Index ............................ 1.28
Test Article Deflection, m (ft) ........................... N/A
Dynamic ............................................... NA
Permanant ............................................. N/A
Vehicle Damage
Exterior
VDS .................................................... FD-4
CDS .................................................... 12FDEW3
Interior
OCID .................................................. AS00000000
Post-Impact Vehicular Behavior
Maximum Roll Angle, deg ............................ 0.90
Maximum Pitch Angle, deg .......................... -2.12
Maximum Yaw Angle, deg ........................... 15.31
8,858kg SUPPORT VEHICLE TEST INERTIAL MASS

ROLL AHEAD
2.0m

FORWARD MOTION STOPPED 3.3m

General Information
Test No. .............................................. 183-008
Date ........................................... Jan 11, 1996

Test Article
Type ................................................. ALPHA 70K TMA
Installation Length, m (ft) ................................ NA
Size and/or dimension and material of key elements .................................... N/A
Shell Type and Condition ................................ NA

Test Vehicle
Type ........................................ Production Model
Designation .................................. 2000P
Model ........................................ Chevrolet C-20
Mass, kg (lb) ............................. 2036 (4480)
Curb ................................................ 1967 (4337)
Dummy(s) ........................................ NA
Grum Static .................................. 1967 (4337)
Impact conditions
Speed, km/h (mph) .......................... 71.8 (44.6)
Angle (deg) ....................................... 0
Impact Severity, kJ (ft-lb) ...................... 391.8 (288.6)

Occupant Risk Values
Impact Velocity, m/s (fps)
z-direction ................................... 9.48 (31.10)
y-direction ................................... 1.03 (3.08)
Ridedown Acceleration, g's
x-direction ..................................... 11.43
y-direction ..................................... 4.79
Support Vehicle, x-direction ................ 2.60
Acceleration Severity Index ............ 0.90
Test Article Deflection, m (ft)
Dynamic ........................................ NA
Permanent ...................................... NA

Vehicle Damage
Exterior
VDS .......................................... FD-4
CDC ........................................ 12FDW3
Interior
CADI ......................................... AS900000

Post-Impact Vehicular Behavior
Maximum Roll Angle, deg ............ 0.60
Maximum Pitch Angle, deg ........... 3.02
Maximum Yaw Angle, deg .......... 53.03

NCHPR 350 TEST NO. 2-52 - ALPHA 70K TMA Test 183-008
General Information

Test No. ........................................... 183-009
Date ............................................. Jan. 25, 1996

Test Article

Type ................................................. ALPHA 70K TMA
Installation Length, m (ft) ...................... NA
Size and/or dimension and material of key elements ...................... N/A

Soil Type and Condition ................................ NA

Test Vehicle

Type ................................................. Production Model
Designation ........................................ 2000P
Model ................................................. Chevrolet C-20
Mass, kg (lb) ......................................... 2118 (4660)
Curb ................................................. 2021 (4456)
Test Inertial ......................................... 2021 (4456)
Dummy(s) ............................................ NA
Gross Static ......................................... 2021 (4456)

Impact conditions

Speed, km/h (mph) ................................... 69.4 (43.1)
Angle (deg) ........................................... 10
Impact Severity, kJ (ft kips) ....................... 375.6 (277.2)

Occupant Risk Values

Impact Velocity, m/s (fps) ....................... 9.31 (30.54)
x-direction ........................................... 0.81 (2.66)
y-direction ........................................... 2.45
Rolldown Acceleration, g's ........................ 10.97
x-direction ........................................... 2.54
y-direction ........................................... 2.54
Support Vehicle, x-direction ..................... 2.54

Acceleration Severity Index ..................... 0.80

Test Article Deflection, m (ft)
Dynamic ............................................. N/A
Permanent .......................................... N/A

Vehicle Damage

Exterior ............................................
VDS ................................................. FD-4
CDC ................................................. 12FDEW3

Interior ..........................................
OCD ................................................ AS90000006

Post-Impact Vehicular Behavior

Maximum Roll Angle, deg ......................... 6.61
Maximum Pitch Angle, deg ....................... 3.39
Maximum Yaw Angle, deg ......................... 55.49

NCHRP 350 TEST NO. 2-53 - ALPHA 70K TMA Test 183-009
these materials must occur in the United States.

(2) The State shall have standard contract provisions that require the use of domestic materials and products, including steel materials, to the same or greater extent as the provisions set forth in this section.

(3) The State elects to include alternate bid provisions for foreign and domestic steel materials which comply with the following requirements. Any procedure for obtaining an order bid based on furnishing foreign steel materi

als which is acceptable to the Division Administrator may be used. The contract provisions must include all bidders to submit a bid based on furnishing foreign steel materials unless such total bid exceeds the lowest total bid based on furnishing foreign steel materials by more than 25 percent.

(4) When steel materials are used in a project, the requirements of this section do not prevent the minimal use of foreign steel materials, if the cost of such materials used does not exceed one-half of one percent (0.5 percent) of the total contract cost of $2,500, whichever is greater. For purposes of this paragraph, the cost is shown to the value of the steel products as they are delivered to the project.

(c)(1) A State may request a waiver of the provisions of this section if:

(i) The application of those provisions would be inconsistent with the public interest;

(ii) Steel materials/products are not produced in the United States in sufficient and reasonable quantities which are of a satisfactory quality.

(2) A request for a waiver, accompanied by supporting information, must be submitted in writing to the Regional Federal Highway Administrator (RFHWA) through the FHWA Division Administrator. A request must be submitted at least in advance of the need for the waiver to allow time for proper review and action on the request. The RFHWA will approve 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 to 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 unilateral waiver and FHWA’s action on such a request may be published in the Federal Register for public comment.

(d) In determining whether the waiver 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.

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


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Federal Highway Administration, DOT

competitive bidding with equally suitable unpainted items;

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

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

(b) When there is available for purchase from more than one nonpatented, nonproprietary material, manufactured 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, the anticipated prices for the related projects are estimated to be approximately the same.

(5) For the purposes of this section, the terms "contract" or "contractual" shall mean a form of a contract or contract other than Federal-aid contracts. Work performed and materials replaced under such guaranty or warranty clauses after final acceptance of the work are not eligible for Federal participation.

(c) Guaranty and warranty clauses.

(a) Except as provided in paragraph (b) of this section, clauses that require the contractor to guarantee or warrant materials and workmanship or to otherwise maintain the work for a specified period after its satisfactory completion by the contractor and its final acceptance by the State will not be approved for use in Federal-aid contracts. Work performed and materials replaced under such guaranty or warranty clauses after final acceptance of the work are not eligible for Federal participation.

(b) Contracts which involve furnishing and/or installing electrical or mechanical equipment, or equipment that should generally include contract clauses that require:

(i) Manufacturer's warranties or guarantees on all electrical and mechanical equipment consistent with those provided as customary trade practice or

(ii) Contractors' warranties or guarantees pertaining to satisfactory product installation and electrical equipment and related components for a period not to exceed 6 months following project acceptance.

§ 635.417 Convict produced materials.

(a) Materials produced 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 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