U.S. Department
of Transportation
Federal Highway Administration

January 13, 2006

400 Seventh St., S.W.
Washington, D.C. 20590

In Reply Refer To:
HSA-10/WZ-220

Mr. Leo J. Yodock, III
623 NE 5th Terrace
Ft. Lauderdale, Florida 33304

Dear Mr. Yodock:

Thank you for your letter of September 15, 2005, requesting Federal Highway Administration (FHWA) acceptance of your company's "Slimline Channelizer" model 2001SL Longitudinal Channelizing Barricade as a crashworthy traffic control device for use in work zones on the National Highway System (NHS). Accompanying your letter were reports of crash testing conducted by the Texas Transportation Institute and video of the tests. You requested that we find it acceptable for use on the NHS as a test level 2 (TL-2) device under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

The 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 are those lightweight devices which are to be self-certified by the vendor, Category II devices are other lightweight devices which need individual crash testing but with reduced instrumentation, Category III devices are barriers and other fixed or heavy devices also needing crash testing with normal instrumentation, and Category IV devices are trailer mounted lighted signs, arrow panels, etc. for which crash testing requirements have not yet been established. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This later memorandum lists devices that are acceptable under Categories I, II, and III.

A brief description of the devices follows:

The Slimline Channelizer is a low-density polyethylene water filled unit that is 18 inches tall. It is rotationally molded and has a nominal wall thickness of 1/4 inch. The overall length of an individual unit is 78 inches and when interconnected with adjacent units, the nominal segment length is 72 inches. The top width of the unit is 6 inches and the bottom measures 12 inches

wide. Flanges extend an additional 14 inches on each side at the base of each unit. Empty weight of the unit is 38 pounds, and 330 pounds when filled with 35 gallons of water. A drawing of a single unit is enclosed for reference.

Testing
Full-scale automobile testing was conducted on your company' devices. Each unit was anchored to the unreinforced concrete apron with six 3/8 inch x 4 inch Hilt Coil Anchors. Two 20x30 inch sign panels were installed on the channelizer installation in the vicinity of the impact; one sign panel was mounted on a 34-inch long 2 pound-per-foot u-channel and the other panel was mounted on a 43-inch long 2 inch I.D. Schedule 40 pipe. Other appurtenances installed and impacted included 44-inch long 2 3/8 inch O.C. plastic delineators and reflectors. Individual units link to form a longitudinal channelizing barricade by interlocking the male/female connectors on the end of each unit. The overall length of the 20 units was 120 feet.

The tests are summarized in the table below.

	NCHRP Report 350 Test 3-71
Test Number	400001-YWC9
Model	2001SL Slimline Longitudinal Channelizing Barricade (LCB)
Flags? Lights?	Yes, two sign panels and warning lights
Mass of Test Vehicle	820 kg
Impact Speed	71.0 km/hr
Impact Angle	19.1 degrees
Velocity Change	5.28 m/s
Occupant Impact Speed	4.3 m/s (longitudinal)
Extent of contact	Cosmetic damage to bumper
Windshield Damage	No contact with windshield
Other notes	Auxiliary devices showed no potential for windshield damage

Findings
The vehicle overrode the Slimline LCB with no tendency towards instability. Damage was limited to scrapes to the bumper. The auxiliary signs, lights, and road tubes had no adverse effect on the impact. There was no occupant compartment deformation.

The results of the testing met the FHWA requirements and, therefore, the device described in the request above and detailed in the enclosed drawing are acceptable for use as a TL-2 LCB on the NHS under the range of conditions tested, when proposed by a State.

You also requested that we accept the Slimline LCB with or without water ballast, fastened to the pavement with as little as two anchors, or free standing, and with or without the use of the delineator posts, signs, and lights. In brief, we concur with these requests.

The vehicle traversal of the LCB will be very different when the ballast is omitted and/or when the attachment to the pavement is reduced. However, based on prior testing of larger LCBs that are freestanding with little or no ballast, the test vehicle simply breaks through the LCB

and knocks the individual units aside. Although we considered the possibility that a vehicle could "capture" individual units if they deform and ride under the vehicle, we have seen no such behavior in any temporary work zone device over the last five years of crash testing.

The Slimline LCB can also be expected to perform in a satisfactory manner if impacted without delineator posts, light or signs present.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-220 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The Yodock Slimline LCB is a patented device and is 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 by a highway agency* for use on Federal-aid 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.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent

holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosures

FHWA:HSA-10:NArtimovich:tb:x61331:1/11/06
File: h://directory folder/artimovich/WZ220-YodockFIN.doc
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N.Artimovich, HSA-10)

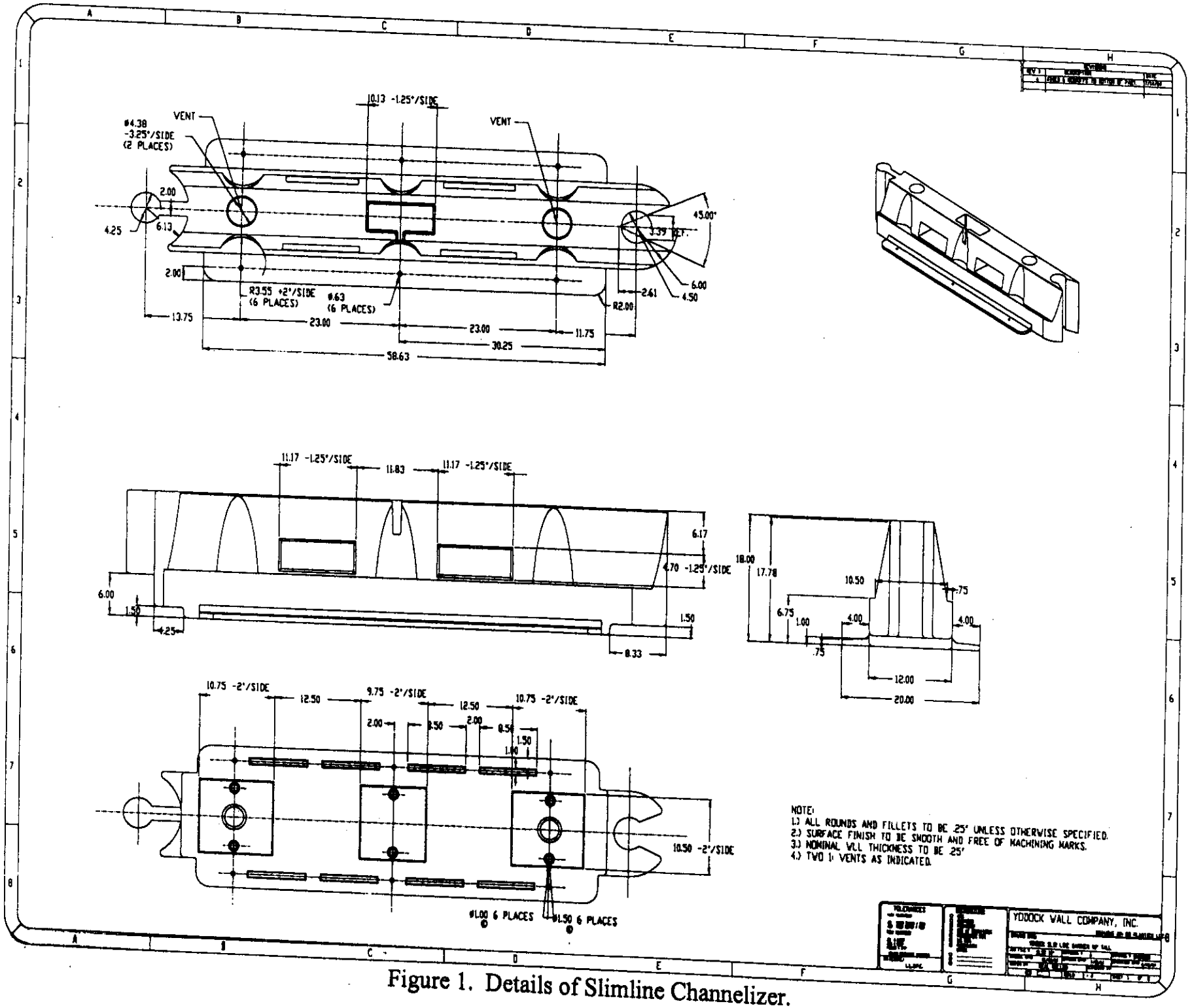
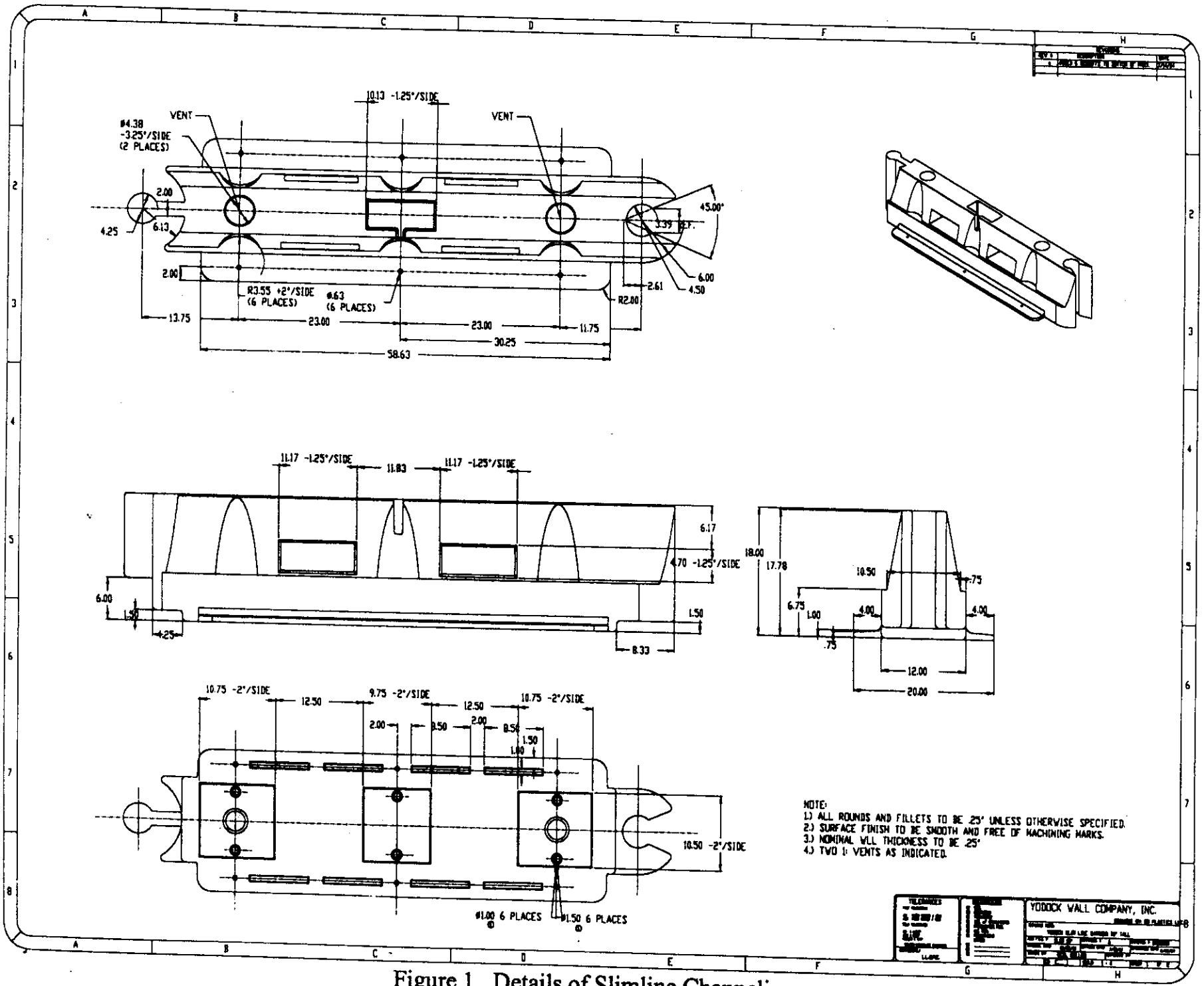


Figure 1. Details of Slimline Channelizer.



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