Mr. Stephen Barratt  
CYRO Industries, Inc.  
100 Enterprise Drive, Suite 700  
P.O. Box 5055  
Rockaway, New Jersey  07853

Dear Mr. Barratt:

In his April 12 letter to Mr. Richard Powers of my staff, Mr. Eric Humphries provided preliminary information on your PARAGLAS SOUNDSTOP Noise Barrier System that was mounted on the back of a 32-inch tall single slope barrier. On May 12, a copy of the Midwest Roadside Safety Facility’s April 22 test report entitled “Design and Evaluation of CYRO’s PARAGLAS SOUNDSTOP Noise Barrier System” was delivered to this office.

The PARAGLAS SOUNDSTOP® TL-4 system consists of transparent PARAGLAS SOUNDSTOP® GS CC Noise Barrier Sheet panels supported by galvanized ASTM A36 steel W8 x 40 posts mounted to the back vertical face of a 32-inch tall concrete safety shape bridge rail. The patented GS CC Sheet panels are infused with polyamide filaments to contain fragments in the event the panel is hit and damaged during a collision. The tested installation was 19-feet high and its traffic face consisted of three galvanized TS 7 x 4 steel tubes set 38 inches, 60 inches and 128 inches above the ground. The lowest rail is 5/16-inch thick; the upper two are 3/16-inch thick. Enclosure 1 shows these major system components. In the test installation, the traffic faces of the horizontal rail elements were offset from the top of the concrete barrier by approximately 3.25 inches and the traffic faces of the vertical support members were offset approximately 10.25 inches. Two tests were run to ensure that the addition of the sound wall would not adversely affect the TL-4 performance of the 32-inch tall concrete bridge rail. Although some snagging on the support posts occurred both with the single-unit truck and with the pickup truck, the tests were deemed to meet all NCHRP Report 350 evaluation criteria. The sound wall was essentially undamaged in the tests, summaries of which are shown in Enclosure 2.

After reviewing the report and the crash test documentation, I conclude that the addition of your PARAGLAS SOUNDSTOP Noise Barrier System to the vertical backside of a 32-inch tall concrete safety shape bridge rail, including the NJ or F-shape profile as well as the tested single slope design, will not change the test level of the bridge rail. All such bridge railings would retain their TL-4 designation with the addition of the noise wall as described herein. If a
42-inch tall barrier is used, the lowest rail would not be needed, but the remaining two should be retained at their tested heights. Because of the added steel rails, the crash performance of the concrete safety shapes is essentially improved by limiting vehicle climb to some extent and by significantly reducing the roll angle of larger vehicles. If used behind a vertical concrete bridge railing rather than a safety shape, its performance is likely to be further improved over that seen in the crash tests.

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

- Our acceptance is limited to the crashworthiness characteristics of the PARAGLAS SOUNDSTOP TL-4 System and is not intended to address its structural features.
- 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 detailed drawings and 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.
- To prevent misunderstanding by others, this letter of acceptance, designated as number B-136 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 PARAGLAS SOUNDSTOP TL-4 System is considered to be proprietary. If proprietary devices are specified by a highway agency 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 (Enclosure 3) for your ready reference.

Sincerely yours,

/original signed by/

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

3 Enclosures
- Test Number: CYRO-1
- Date: 8/18/04
- NCHRP 350 Test Designation: 4-12
- Appurtenance: CYRO Paraglas Soundstop Noise Wall Barrier
- Total Length: 34.56 m
- Overall Height: 5,869 mm
- Crash Rail Elements
  - Material: Galvanized Steel
  - Length: 5,988 mm
  - Dimensions
    - Lower Rail: TS 178 mm x 102 mm by 7.9 mm thick
    - Middle Rail: TS 178 mm x 102 mm by 4.8 mm thick
    - Upper Rail: TS 178 mm x 102 mm by 4.8 mm thick
  - Top Mounting Height
    - Lower Rail: 965 mm
    - Middle Rail: 1,524 mm
    - Upper Rail: 5,251 mm
- Post Nos. 1-18
  - Material: Galvanized, ASTM A36 Steel
  - Dimensions: W203x59.5 by 5,817 mm long
  - Spacing: 2,000 mm
- Paraglas Soundstop Panels
  - Upper Panel: 1,905 mm x 1,170 mm by 20 mm thick
  - Lower Panel: 1,905 mm x 3,585 mm by 20 mm thick
- Vehicle Model: 1988 Ford F-800 Single-Unit Truck
  - Curb: 5,452 kg
  - Test Inertial: 8,092 kg
  - Gross Static: 8,092 kg
- Impact Location: 724 mm upstream centerline post no. 6
- Vehicle Speed
  - Impact: 82.4 km/h
  - Exit: 70.7 km/h
- Vehicle Angle
  - Impact: 17.7 deg
  - Exit: 5.4 deg
- Vehicle Snagging: Minor
- Vehicle Stability: Satisfactory
- Occupant Ridedown Deceleration (10 msec avg.)
  - Longitudinal (not required): 6.00 g's < 20 g's
  - Lateral (not required): 7.86 g's
- Occupant Impact Velocity
  - Longitudinal (not required): 3.30 m/s < 12 m/s
  - Lateral (not required): 4.48 m/s
- Vehicle Damage: Moderate
  - TAD: 1-RFO-5
  - SAE: 1-RFAW5
- Vehicle Stopping Distance: 64.16 m downstream
- Barrier Damage: Minimal
- Maximum Rail Deflections
  - Permanent Set: NA
  - Dynamic: 45 mm (top of wall)
- Working Width: 668 mm

Figure 26. Summary of Test Results and Sequential Photographs, Test CYRO-1
- Test Number ......................... CYRO-2
- Date ......................... 10/19/04
- NCHRP 350 Test Designation ........ 4-11
- Appurtenance ..................... CYRO Paraglas Soundstop Noise Wall Barrier
- Total Length .................. 34.56 m
- Overall Height .................. 5,869 mm
- Crash Rail Elements
  - Material .......................... Galvanized Steel
  - Length .......................... 5,988 mm
  - Dimensions
    - Lower Rail .................. TS 178 mm x 102 mm by 7.9 mm thick
    - Middle Rail ................. TS 178 mm x 102 mm by 4.8 mm thick
    - Upper Rail .................. TS 178 mm x 102 mm by 4.8 mm thick
  - Top Mounting Height
    - Lower Rail .................. 965 mm
    - Middle Rail ................. 1,524 mm
    - Upper Rail .................. 5,251 mm
- Post Nos. 1-18
  - Material ......................... Galvanized, ASTM A36 steel
  - Dimensions ..................... W203x59.5 by 5,817 mm long
  - Spacing .......................... 2,000 mm
- Paraglas Soundstop Panels
  - Upper Panel ..................... 1,905 mm x 1,170 mm by 20 mm thick
  - Lower Panel ..................... 1,905 mm x 3,585 mm by 20 mm thick
- Vehicle Model ................... 1998 GMC C2500 ½-ton pickup
  - Curb .......................... 1,954 kg
  - Test Inertial .................. 2,013 kg
  - Gross Static .................. 2,013 kg
- Impact Location .................. 2,505 mm upstream centerline post no. 9
- Vehicle Speed
  - Impact ......................... 99.0 km/h
  - Exit .......................... 82.1 km/h
- Vehicle Angle
  - Impact ......................... 25.0 deg
  - Exit .......................... 3.0 deg
- Vehicle Snagging .................. Moderate
- Vehicle Stability .................. Satisfactory
- Occupant Ridedown Deceleration (10 msec avg.)
  - Longitudinal .................. 7.59/-9.01 g’s < 20 g’s
  - Lateral (not required) ........ 15.21/-15.66 g’s
- Occupant Impact Velocity
  - Longitudinal .................. 5.40 m/s < 12 m/s
  - Lateral (not required) ........ 8.52 m/s
- PHID .......................... 17.93 g’s
- THIV .......................... 10.21 m/s
- Vehicle Damage .................. Moderate
- TAD<sup>4</sup> ..................... 1-RFQ-6
- SAE<sup>3</sup> ....................... 1-RFAW7
- Vehicle Stopping Distance .......... 67.46 m downstream
- 8.33 m traffic-side face
- Barrier Damage .................. Minimal
- Maximum Rail Deflections
  - Permanent Set .................. NA
  - Dynamic ....................... 20 mm (top of wall)
- Working Width .................. 642 mm

Figure 50. Summary of Test Results and Sequential Photographs, Test CYRO-2