

In summary we agree that Nucor Strong Post W-beam guardrail system without blockouts in both roadside and median applications as described above meet the appropriate evaluation criteria for the NCHRP 350 TL-3 devices. Also, the Nucor Strong Posts as described above can be used as a substitute for other approved W-beam posts in the standard 27" (686 mm) high non-proprietary strong post TL-3 W-beam systems with the use of plastic blockouts in the roadside configuration. They should not, however, be used as one-for-one replacements of W6 x 8.5 steel posts in repair/maintenance situations until further testing is conducted.

The above systems may be used at all appropriate locations on the National Highway System (NHS) when selected by the contracting authority, subject to the provisions of Title 23, Code of Federal Regulations, Section 635.411, as they pertain to proprietary products. Please note that this acceptance is only for the use of the posts in the barrier proper. They cannot be used in any of the guardrail terminals that require breakaway posts unless specifically tested for that application. Also, please note also that this acceptance is based on the reported crash performance of your posts and is not meant to address their installation, maintenance or repair characteristics. Your company's 31-inch (787 mm) high guardrail discussed above may be considered crashworthy under both the existing Report 350 guidelines and under the new guidelines when they are formally adopted, assuming that the test matrix currently being proposed by the researchers remains unchanged.

Standard provisions

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

- This 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 B-162 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 Nucor Strong Post W-beam guardrail system without blockouts and Nucor Strong Posts with blockouts for use in non-proprietary W-beam guardrail systems are patented products and considered 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 the 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.

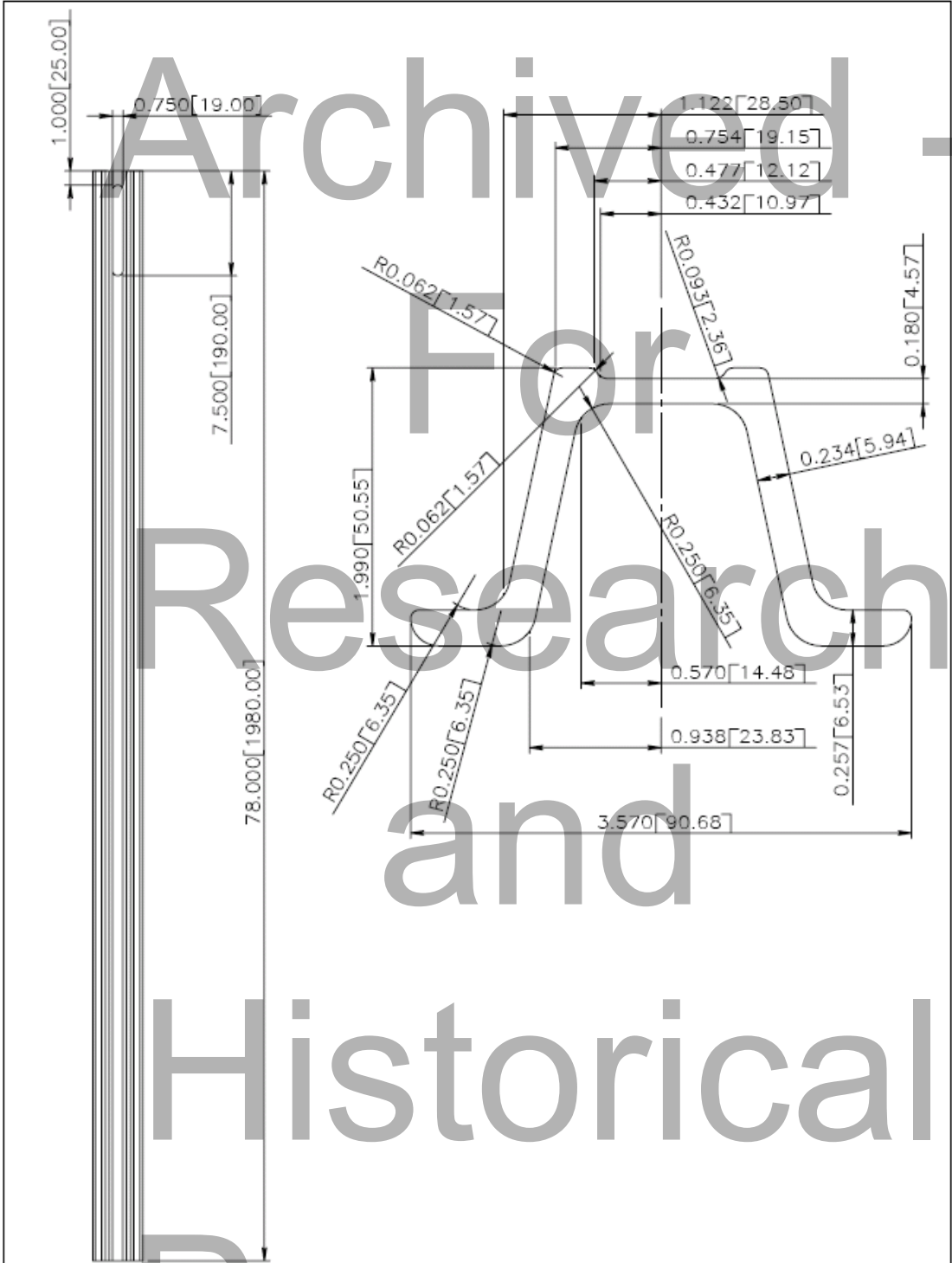
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

George E. Rice
Acting Director, Office of Safety Design
Office of Safety

Enclosures

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For
Research
and
Historical
Purposes
Only



2007

RIB-BAK W-BEAM LINE POST

SHEET NO.	DATE
1 of 2	27/04/07

Only

FBB01 Splice Bolts
(8 EA Guardrail Joint)

RWM02a W-Beam Guardrail

FBC16a x 3.5[90] LNG
w/FBB01 Nut

3.5[90] x 1/4[5] Washer

Rib-Bak W-Beam Line Post

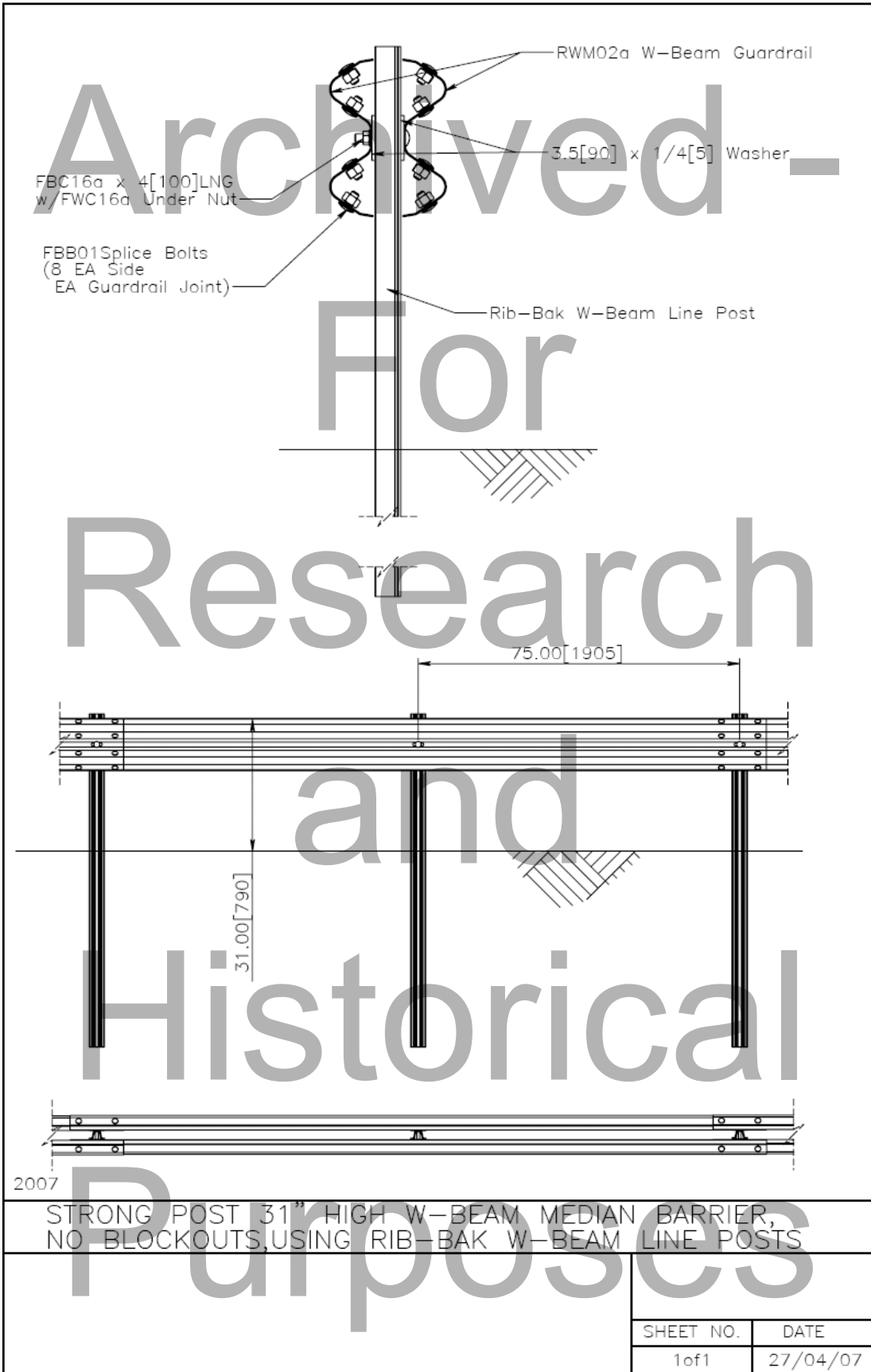


2007

STRONG POST 31" HIGH W-BEAM ROADSIDE BARRIER,
NO BLOCKOUTS, USING RIB-BAK W-BEAM LINE POSTS

SHEET NO.	DATE
1 of 1	27/04/07

Only



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For

Research

and

Historical

Purposes

Only

2007

STRONG POST 31" HIGH W-BEAM MEDIAN BARRIER,
NO BLOCKOUTS, USING RIB-BAK W-BEAM LINE POSTS

SHEET NO.	DATE
1 of 1	27/04/07

Archived -

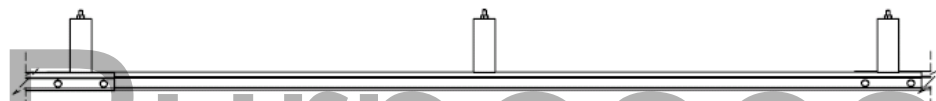
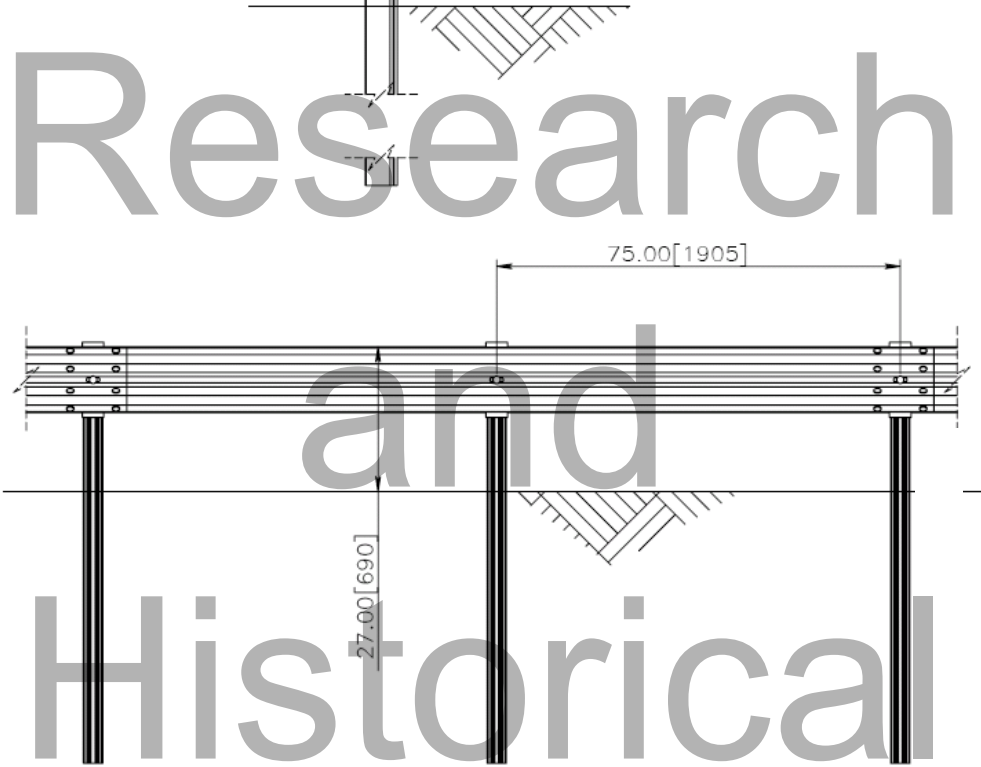
FBC16a x 12[300]LNG
w/FBB01 Nut

Plastic Blockout

RWM02a W-Beam Guardrail

FBB01 Splice Bolts
(8 EA Guardrail Joint)

Rib-Bak W-Beam Line Post



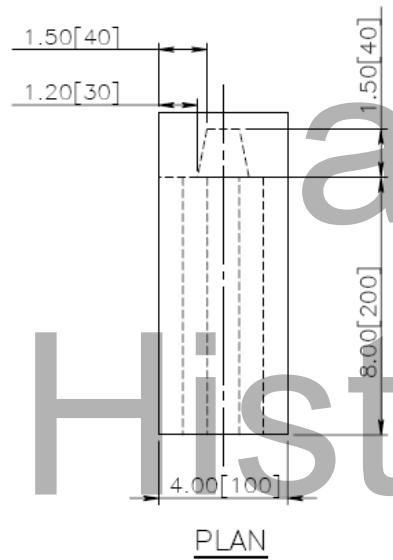
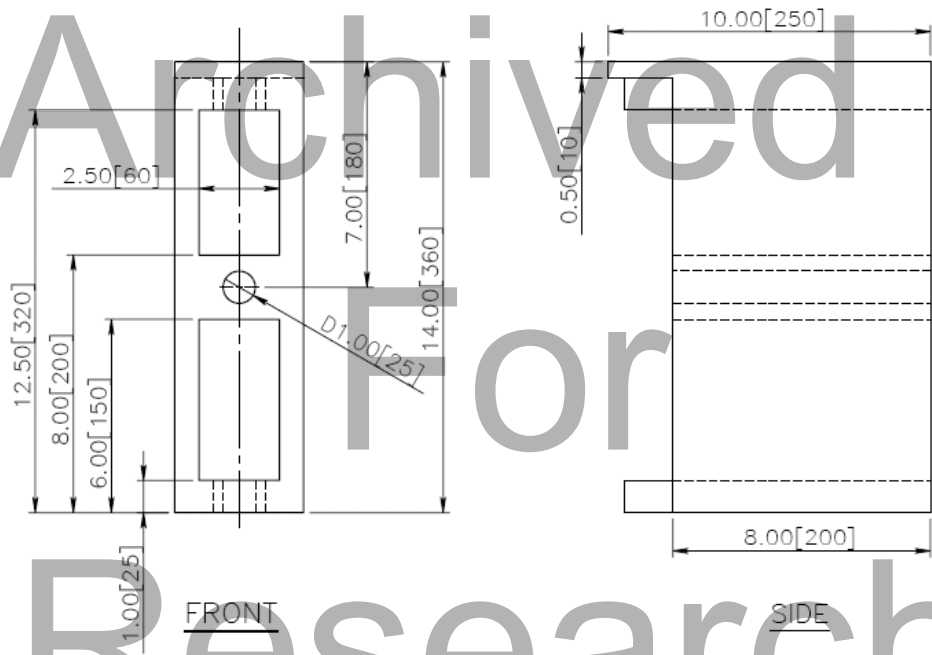
2007

STANDARD 27" HIGH W-BEAM ROADSIDE BARRIER,
USING RIB-BAK W-BEAM LINE POSTS

SHEET NO.	DATE
1 of 1	27/04/07

Only

Archived -
 For
 Research
 Purposes

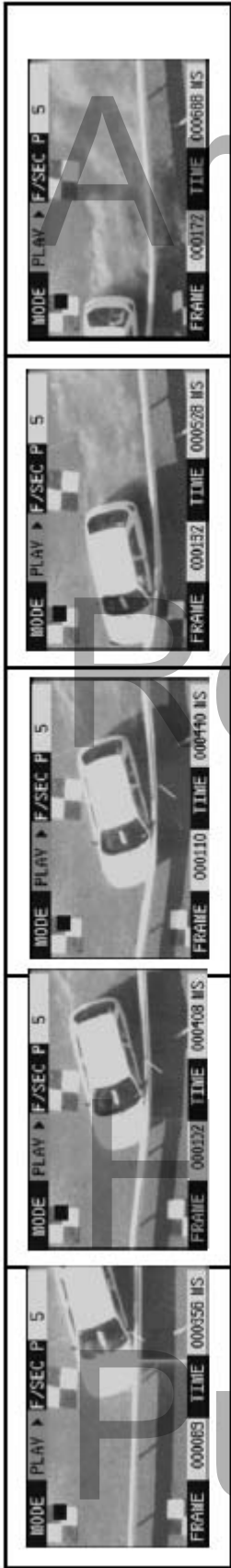


2007

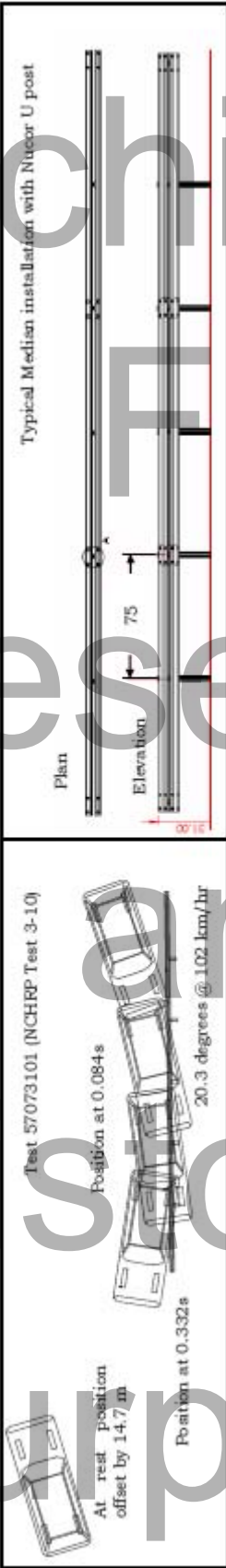
PLASTIC BLOCKOUT FOR RIB-BAK W-BEAM LINE POST

SHEET NO.	DATE
1 of 1	27/04/07

Only



0.000s 0.052s 0.084s 0.172s 0.332s



Typical Median installation with Nucor U post

General Information
 Test Agency Holmes Solutions, New Zealand
 Test Designation NCHRP 350 Test 3-10
 Test No. 057073101
 Date 5 March 2007

Test Article
 Type Nucor 31" strong post W-beam median guardrail system
 Name or Manufacturer... Nucor
 Installation Length..... 55.4 m
 Material or Key Elements AASHTO SGR04-a-b Guardrail with 5 pound Nucor U posts
 AASHTO 'standard' soil M 147-64

Soil Type and Condition...

Test Vehicle
 Type Production Model
 Designation 820C
 Model 1997 Toyota Starlet
 Mass (kg) 896.5
 Curb 837.0
 Dummy 76
 Gross Static 913.0

Impact Conditions
 Speed (km/h) 102.2
 Angle (deg) 20.3

Exit Conditions
 Speed (km/h) 57.1
 Angle (deg) 5.2

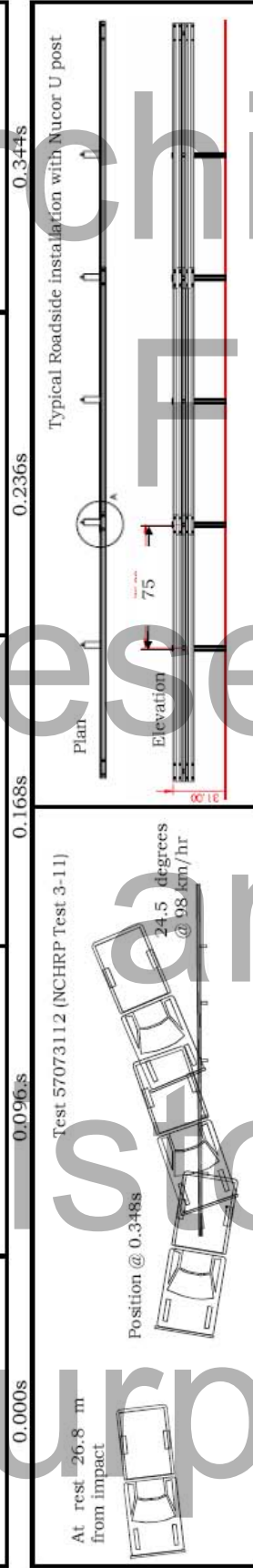
Occupant Risk Values
 Impact Velocity (m/s)
 x-direction 6.8
 y-direction 3.5
 THIV (km/h) 29.6
 Ridedown Accelerations
 x-direction (g's) -6.3
 y-direction (g's) 7.8
 PHD (g's) 9.4
 ASI 0.66
 Max. 0.050-s Average
 x-direction (g's) -6.5
 y-direction (g's) 4.8
 z-direction (g's) 2.5

Test Article Deflections
 Dynamic (m) 0.68
 Permanent (m) 0.29

Vehicle Damage
 Exterior
 VDS 11LFC-4
 CDC 11FLEE2
 Maximum Exterior Vehicle Crush (mm) 295 mm
 Interior
 OCIDI AS0000000
 Max. Occ. Compart. Deformation (mm) 2

Post-Impact Behaviour
 Max. Yaw Angle (deg) -164.7
 Max. Pitch Angle (deg) 14.5
 Max. Roll Angle (deg) -11.8

Only



General Information
 Test Agency Holmes Solutions, New Zealand
 Test Designation NCHRP-350 Test 3-11
 Test No. 057073112
 Date 15 March 2007

Test Article
 Type Nucor 31" strong post W-beam roadside guardrail system
 Name or Manufacturer Nucor
 Installation Length 55.4 m
 Material or Key Elements AASHTO M 280-01a-b Guardrail with 5 pound Nucor U posts
Soil Type and Condition AASHTO 'standard' soil M147-64

Test Vehicle
 Type Production Model
 Designation 2270P
 Model 2003-Dodge-Ram
 Mass (kg) 2220.0
 Curb 2232.5
 Test Inertial n/a
 Dummy n/a
 Gross Static 2232.5

Impact Conditions
 Speed (km/h) 98.0
 Angle (deg) 24.5

Exit Conditions
 Speed (km/h) n/a
 Angle (deg) #5.0

Occupant Risk Values
 Impact Velocity (m/s)
 x-direction 3.4
 y-direction -4.2
 THIV (km/h) 21.6
 Ridedown Accelerations
 x-direction (g's) -6.2
 y-direction (g's) 6.4
 PHD (g's) 8.0
 ASI 0.59
 Max. 0.050-s Average
 x-direction (g's) -3.4
 y-direction (g's) 4.8
 z-direction (g's) 2.7

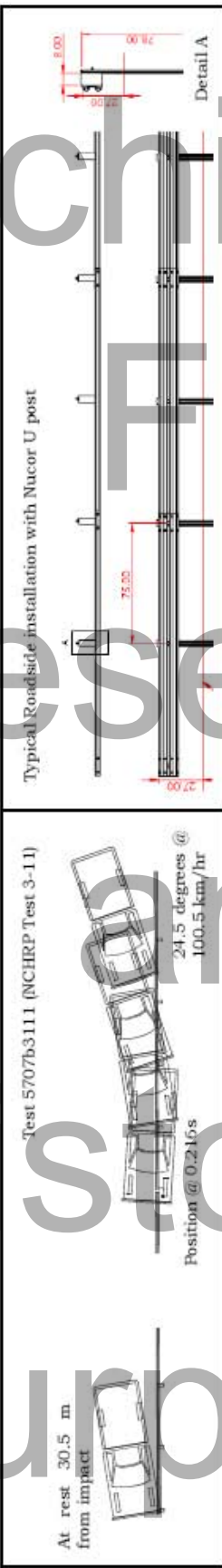
Test Article Deflections
 Dynamic (m) 1.05
 Permanent (m) 0.80

Vehicle Damage
 Exterior
 VDS 11LFO-2
 CDC 11FLEN2
 Maximum Exterior Vehicle Crush (mm) 198
 Interior
 OCIDI ASO000000
 Max. Occ. Compart. Deformation (mm) 1

Post-Impact Behaviour
 Max. Yaw Angle (deg) -30.7
 Max. Pitch Angle (deg) -8.6
 Max Roll Angle (deg) -11.8



0.000s 0.072s 0.144s 0.216s 0.360s



General Information
 Test Agency Holmes Solutions, New Zealand
 Test Designation NCHRP 350-Test 3-11
 Test No. 05707b3111
 Date 16 March 2007

Test Article
 Type Nucor 27" strong post W-beam system with plastic blockouts
 Name or Manufacturer... Nucor
 Installation Length..... 57.1 m
 Material or Key Elements AASHTO SGR04a-b guardrail with 5 pound Nucor Top Hat posts
 AASHTO 'standard' soil M147-64

Soil Type and Condition...

Test Vehicle
 Type Production Model
 Designation 2000P
 Model 2002-Chevrolet Silverado 2500
 Mass (kg) 2235.5
 Curb 2053.0
 Test Inertial n/a
 Dummy 2053.0
 Gross Static 2053.0

Impact Conditions
 Speed (km/h) 100.5
 Angle (deg) 24.5

Exit Conditions
 Speed (km/h) n/a
 Angle (deg) ≈4.5

Occupant Risk Values
 Impact Velocity (m/s)
 x-direction 3.7
 y-direction -4.1
 THIV (km/h) 22.9
 Ridedown Accelerations
 x-direction (g's) -9.2
 y-direction (g's) 6.4
 PHD (g's) 9.4
 ASI 0.56
 Max. 0.050-s Average
 x-direction (g's) -3.7
 y-direction (g's) 4.3
 z-direction (g's) 4.0

Test Article Deflections
 Dynamic (m) 1.15
 Permanent (m) 0.90

Vehicle Damage
 Exterior
 WDS 11LFLO-2
 CDC 11FLEN2
 Maximum Exterior Vehicle Crush (mm) 75
 Interior
 OCID ASO000000
 Max. Occ. Compart. Deformation (mm) 2

Post-Impact Behaviour
 Max. Yaw Angle (deg) -32.8
 Max. Pitch Angle (deg) -4.4
 Max. Roll Angle (deg) -8.2

Title 23, Code of Federal Regulations

§ 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 competitive bidding with equally suitable unpatented items; or

(2) The State transportation department 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 transportation department 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 transportation department 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.

(f) In the case of a design-build project, the following requirements apply: 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 Request for Proposals document unless the conditions of paragraph (a) of this section are applicable.

[41 FR 36204, Aug. 27, 1976, as amended at 67 FR 75926, Dec. 10, 2002]