

WORKBOOK CHANGE(S)

Add D 52/0000.DOT
Rev Date 12-1-03
F.A. Date 2-3-04
Letting Date 7-04

Move D _____
To Deleted File _____
Rev Date _____
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Letting Date _____

Remarks New SS.

Dates

*Copy of Spec to Paul that Impacts

QPL (ONLY) _____

Added to Nextwb file 12-12-03 sh

Deleted from Nextwb file _____

History File Updated _____

Rolodexed 4/21/04 sh

Additional back-up see _____

Route Slip

U.S. Department of Transportation
Federal Highway Administration
Florida Division
227 N. Bronough Street, Room 2015
Tallahassee, FL 32301

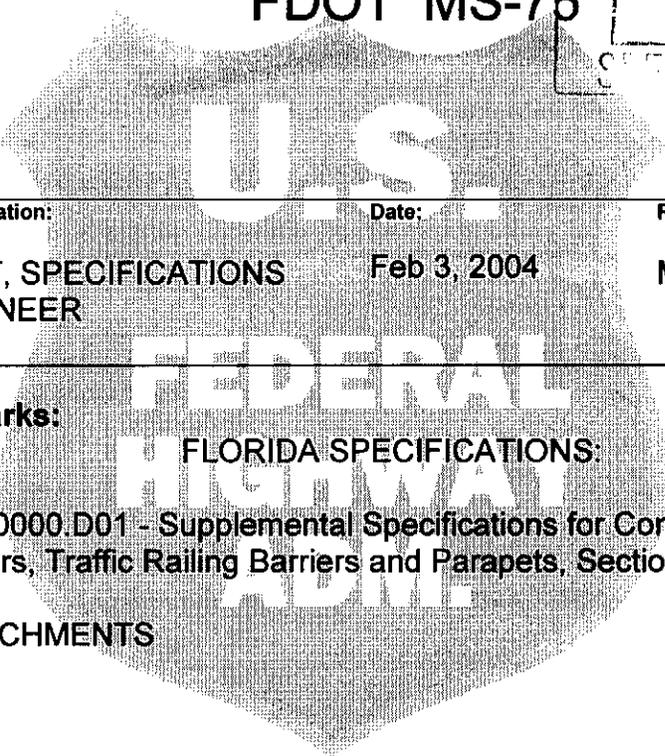
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SPECIFICATIONS



To: MR. DUANE BRAUTIGAM	Organization: FDOT, SPECIFICATIONS ENGINEER	Date: Feb 3, 2004	Routing Symbol: MS-75
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- Per Your Request
- For Your Information**
- Per Our Conversation
- Comment
- Take Appropriate Action
- Note and Return
- Discuss With Me
- For Your Approval
- For Your Signature
- Please Answer
- Prepare Reply
- For Signature of

Remarks:

**FEDERAL
HIGHWAY
ADMINISTRATION**
FLORIDA SPECIFICATIONS:
D5210000.D01 - Supplemental Specifications for Concrete
Barriers, Traffic Railing Barriers and Parapets, Section 521

ATTACHMENTS

From: FOR: JAMES E. ST. JOHN, DIVISION ADMINISTRATOR	Telephone Number: (850) 942-9650, EXT. 3035	FDOT MS: # 29	Org/Rtg Symbol
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DON Davis: ANN to file in binders cc: 1 (w/specification)



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

December 3, 2003

Mr. Donald Davis
Program Operations Engineer
Federal Highway Administration
227 N. Bronough Street, Suite 2015
Tallahassee, Florida 32301

Re: Office of Design, Specifications
Section 521
Proposed Specification: D5210000.D01 – Concrete Barriers, Traffic Railing Barriers and Parapets.

Dear Mr. Davis:

We are resubmitting, for your approval, two copies of a proposed Supplemental Specification for Concrete Barriers, Traffic Railing Barriers and Parapets.

These changes were made Ghulam Mujtaba, State Materials Office to require Contractors to obtain precast Concrete Barriers, Traffic Railing Barriers and Parapets from a plant that is on the Department's list of qualified precast concrete plants.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or duane.brautigam@dot.state.fl.us.

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

Signature on file

Duane F. Brautigam, P.E.
State Specifications Engineer

DFB/jho
Attachment

cc: General Counsel
Florida Transportation Builders' Assoc.
State Construction Engineer

CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.

(REV 12-1-03)

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

- Deleted: 10-14-03
- Deleted: 11-20-03
- Inserted: 10-14-03
- Deleted: 10-16-03
- Inserted: 10-16-03
- Inserted: 11-20-03

521-1 Description.

Construct Precast or Cast In Place concrete barriers, traffic railing barriers and parapets, herein referred to as "Barrier Wall", in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier wall. Do not use permanent precast concrete barrier wall on bridge or box culvert structures.

- Deleted: plain or reinforced
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- Deleted: with precast or cast in place concrete,
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- Inserted: s
- Deleted: s

Provide written certification from the manufacturer of the Precast Barrier Wall that the Barrier Wall meets the requirements of this Section. Barrier Wall is produced using certification acceptance; therefore, assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 400 for Barrier Wall construction. Perform all Quality Control Testing and inspections using CTQP qualified testing personnel. Perform compressive strength testing in a laboratory inspected by CCRL or CMEC.

Ensure that each shipment of products to the job site includes a list of products shipped and the required written certification statement for each product. Provide this list and certification(s) to the Engineer.

521-2 Materials.

Meet the following requirements:

- Portland Cement ConcreteSection 346
- Reinforcing SteelSection 415
- Joint Materials.....Section 932

521-3 Use of Precast Temporary Barrier Wall.

521-3.1 General: Meet the requirements of 102-9.5.2.

521-3.2 Precast Temporary Barrier Wall Meeting the Requirements of the 2000 Roadway and Traffic Design Standards Index 415: Use Precast Temporary Barrier Wall when certification is provided to the Engineer that the Precast Temporary Barrier Wall was constructed in accordance with and meets the requirements of the 2000 Roadway and Traffic Design Standards Index 415, and meets the approval of the Engineer.

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521-3.3 Procurement of Proprietary Precast Temporary Barrier Wall: Obtain and use Precast Temporary Barrier Wall listed on the Departments Qualified Products List (QPL) from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

Ensure each Precast Temporary Barrier Wall Section has permanently clear marking, showing the manufacture date, serial number, and manufacturer's name or symbol and the Department approved drawing number that it meets. The markings may be located on a plate, plaque, or cast in the panel.

521-3.4 Procurement of Precast Temporary Barrier Wall Meeting the Requirements of Structures Standards Index No. 715: Obtain and use Precast Temporary Barrier Wall from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

521-4 Construction.

521-4.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-4.2 Stationary Form Construction: Provide precast or cast in place concrete barrier wall constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm], Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-4.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer.

Provide a finished texture to the slip formed barrier wall by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier wall having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-5 Curing.

Meet the requirements of Section 400.

521-6 Joints.

521-6.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing

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Deleted: in accordance with 521-3.1

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Deleted: , designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents

Deleted: Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

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Deleted: in accordance with 521-3.1

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Deleted: Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. After removing the form, cure the barrier wall by one of the methods specified in

Inserted:

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Deleted: , for the remainder of the 72 hour curing period

Deleted: Cure slip formed barrier walls in accordance with 400-16.1

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used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier wall supported by soil or flexible foundation materials in the manner detailed in the plans.

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521-6.2 Contraction Joints in Barrier Wall Supported by or Adjoining Rigid

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Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier wall on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

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521-6.3 Expansion Joints in Barrier Wall Supported by or Adjoining Rigid

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Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier wall, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier wall, construct expansion joints as in reinforced barrier wall or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

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521-7 Method of Measurement.

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The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier wall on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier wall to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

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521-8 Basis of Payment.

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Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

- Item No. 521- 1- Concrete Barrier Wall - per foot.
- Item No. 2521- 1- Concrete Barrier Wall - per meter.
- Item No. 521- 5- Concrete Traffic Railing Barrier (Bridge) – per foot.
- Item No. 2521- 5- Concrete Traffic Railing Barrier (Bridge) – per meter.
- Item No. 521- 6- Concrete Parapet (Bridge) – per foot.
- Item No. 2521- 6- Concrete Parapet (Bridge) – per meter.
- Item No. 521-72- Concrete Barrier Wall – per foot.
- Item No. 2521-72- Concrete Barrier Wall – per meter.

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.
(REV 12-1-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct Precast or Cast In Place concrete barriers, traffic railing barriers and parapets, herein referred to as "Barrier Wall", in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier wall. Do not use permanent precast concrete barrier wall on bridge or box culvert structures.

Provide written certification from the manufacturer of the Precast Barrier Wall that the Barrier Wall meets the requirements of this Section. Barrier Wall is produced using certification acceptance; therefore, assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 400 for Barrier Wall construction. Perform all Quality Control Testing and inspections using CTQP qualified testing personnel. Perform compressive strength testing in a laboratory inspected by CCRL or CMEC.

Ensure that each shipment of products to the job site includes a list of products shipped and the required written certification statement for each product. Provide this list and certification(s) to the Engineer.

521-2 Materials.

Meet the following requirements:

- Portland Cement ConcreteSection 346
- Reinforcing SteelSection 415
- Joint Materials.....Section 932

521-3 Use of Precast Temporary Barrier Wall.

521-3.1 General: Meet the requirements of 102-9.5.2.

521-3.2 Precast Temporary Barrier Wall Meeting the Requirements of the 2000 Roadway and Traffic Design Standards Index 415: Use Precast Temporary Barrier Wall when certification is provided to the Engineer that the Precast Temporary Barrier Wall was constructed in accordance with and meets the requirements of the 2000 Roadway and Traffic Design Standards Index 415, and meets the approval of the Engineer.

521-3.3 Procurement of Proprietary Precast Temporary Barrier Wall: Obtain and use Precast Temporary Barrier Wall listed on the Departments Qualified Products List (QPL) from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

Ensure each Precast Temporary Barrier Wall Section has permanently clear marking, showing the manufacture date, serial number, and manufacturer's name or symbol and the Department approved drawing number that it meets. The markings may be located on a plate, plaque, or cast in the panel.

521-3.4 Procurement of Precast Temporary Barrier Wall Meeting the Requirements of Structures Standards Index No. 715: Obtain and use Precast Temporary Barrier Wall from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

521-4 Construction.

521-4.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-4.2 Stationary Form Construction: Provide precast or cast in place concrete barrier wall constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm]. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-4.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer.

Provide a finished texture to the slip formed barrier wall by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier wall having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-5 Curing.

Meet the requirements of Section 400.

521-6 Joints.

521-6.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing

used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier wall supported by soil or flexible foundation materials in the manner detailed in the plans.

521-6.2 Contraction Joints in Barrier Wall Supported by or Adjoining Rigid

Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier wall on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-6.3 Expansion Joints in Barrier Wall Supported by or Adjoining Rigid

Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier wall, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier wall, construct expansion joints as in reinforced barrier wall or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-7 Method of Measurement.

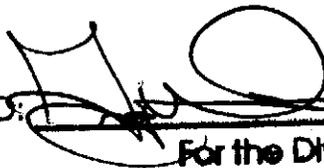
The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier wall on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier wall to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-8 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

- Item No. 521- 1- Concrete Barrier Wall - per foot.
- Item No. 2521- 1- Concrete Barrier Wall - per meter.
- Item No. 521- 5- Concrete Traffic Railing Barrier (Bridge) – per foot.
- Item No. 2521- 5- Concrete Traffic Railing Barrier (Bridge) – per meter.
- Item No. 521- 6- Concrete Parapet (Bridge) – per foot.
- Item No. 2521- 6- Concrete Parapet (Bridge) – per meter.
- Item No. 521-72- Concrete Barrier Wall – per foot.
- Item No. 2521-72- Concrete Barrier Wall – per meter.

APPROVED:  DATE 2-3-04
For the Division Administrator

521 CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.
(REV 12-1-03) (FA 2-3-04) (7-04)

SECTION 521 (Pages 589-591) is deleted and the following substituted:

SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS

521-1 Description.

Construct Precast or Cast In Place concrete barriers, traffic railing barriers and parapets, herein referred to as "Barrier Wall", in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier wall. Do not use permanent precast concrete barrier wall on bridge or box culvert structures.

Provide written certification from the manufacturer of the Precast Barrier Wall that the Barrier Wall meets the requirements of this Section. Barrier Wall is produced using certification acceptance; therefore, assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 400 for Barrier Wall construction. Perform all Quality Control Testing and inspections using CTQP qualified testing personnel. Perform compressive strength testing in a laboratory inspected by CCRL or CMEC.

Ensure that each shipment of products to the job site includes a list of products shipped and the required written certification statement for each product. Provide this list and certification(s) to the Engineer.

521-2 Materials.

Meet the following requirements:

Portland Cement Concrete	Section 346
Reinforcing Steel	Section 415
Joint Materials.....	Section 932

521-3 Use of Precast Temporary Barrier Wall.

521-3.1 General: Meet the requirements of 102-9.5.2.

521-3.2 Precast Temporary Barrier Wall Meeting the Requirements of the 2000 ~~Roadway And Traffic~~ Design Standards Index 415: Use Precast Temporary Barrier Wall when certification is provided to the Engineer that the Precast Temporary Barrier Wall was constructed in accordance with and meets the requirements of the ~~2000 Traffic~~ ^{Roadway And} Design Standards, Index 415, and meets the approval of the Engineer. ^{No.}

521-3.3 Procurement of Proprietary Precast Temporary Barrier Wall: Obtain and use Precast Temporary Barrier Wall listed on the Departments Qualified Products List (QPL) from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

Ensure each Precast Temporary Barrier Wall Section has permanently clear ^{permanent} marking, showing the manufacture date, serial number, and manufacturer's name or symbol and

the Department approved drawing number that it meets. The markings may be located on a plate, plaque, or cast in the panel.

521-3.4 Procurement of Precast Temporary Barrier Wall Meeting the Requirements of Structures Standards, Index No. 715: Obtain and use Precast Temporary Barrier Wall from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

521-4 Construction.

521-4.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-4.2 Stationary Form Construction: Provide precast or cast in place concrete barrier wall constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm]. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-4.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer.

Provide a finished texture to the slip formed barrier wall by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

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During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

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Meet the requirements of Section 400.

521-6 Joints.

521-6.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier wall supported by soil or flexible foundation materials in the manner detailed in the plans.

521-6.2 Contraction Joints in Barrier Wall Supported by or Adjoining Rigid Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier wall on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-6.3 Expansion Joints in Barrier Wall Supported by or Adjoining Rigid Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier wall, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier wall, construct expansion joints as in reinforced barrier wall or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-7 Method of Measurement.

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Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.

Item No. 2521-72- Concrete Barrier Wall – per meter.



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

December 3, 2003

Mr. Donald Davis
Program Operations Engineer
Federal Highway Administration
227 N. Bronough Street, Suite 2015
Tallahassee, Florida 32301

Re: Office of Design, Specifications
Section 521
Proposed Specification: D5210000.D01 – Concrete Barriers, Traffic Railing Barriers and Parapets.

Dear Mr. Davis:

We are resubmitting, for your approval, two copies of a proposed Supplemental Specification for Concrete Barriers, Traffic Railing Barriers and Parapets.

These changes were made Ghulam Mujtaba, State Materials Office to require Contractors to obtain precast Concrete Barriers, Traffic Railing Barriers and Parapets from a plant that is on the Department's list of qualified precast concrete plants.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or duane.brautigam@dot.state.fl.us.

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

A handwritten signature in black ink, appearing to read "Duane F. Brautigam".

Duane F. Brautigam, P.E.
State Specifications Engineer

DFB/jho
Attachment

cc: General Counsel
Florida Transportation Builders' Assoc.
State Construction Engineer



POSTED 10/17/2003
JTB

Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: October 17, 2003

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer 

SUBJECT: **Proposed Specifications Change – D5210000 – Concrete Barriers, Traffic Railing Barriers and Parapets.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Concrete Barriers, Traffic Railing Barriers and Parapets.

This change was proposed by Ghulam Mujtaba, State Materials Office to add personnel qualification requirements of incidental precast concrete facilities.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after November 14, 2003 may not be considered. Your input is encouraged.

DFB/jho

Attachment

COMMENTS:

Submitted by:

Phone #:

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND
PARAPETS.
(REV 10-14-0310-16-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ *Precast or Cast In Place* concrete barriers, traffic railing barriers and parapets, herein referred to as "Barrier Walls", ~~with precast or cast in place concrete,~~ in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent precast concrete* barrier walls on bridge or box culvert structures.

Provide written certification from the manufacturer of the Barrier Wall that the Barrier Wall meets the requirements of this Section. Barrier Wall is produced using certification acceptance; therefore, assume responsibility for performance of all quality control testing and inspections required by Sections 346 and 400 for Barrier Wall construction. Perform all Quality Control Testing using CTQP qualified testing personnel. Perform compressive strength testing in a laboratory inspected by CCRL or CMEC.

521-2 Materials.

Meet the following requirements:

Portland Cement Concrete.....	Section 346
Reinforcing Steel.....	Section 415
Joint Materials.....	Section 932

521-3 Use of Precast Temporary Barrier Walls.

521-3.1 General: *Meet the requirements of 102-9.5.2.*

521-3.2 Precast Temporary Barrier Wall Meeting the Requirements of the 2000 Roadway and Traffic Design Standards Index 415: *Use Precast Temporary Barrier Wall when certification is provided to the Engineer that the Precast Temporary Barrier Wall was constructed in accordance with and meets the requirements of the 2000 Roadway and Traffic Design Standards Index 415, and meets the approval of the Engineer.*

521-3.3 Procurement of Proprietary Precast Temporary Barrier Wall: *Obtain and use Precast Temporary Barrier Wall listed on the Departments Qualified Products List (QPL) from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.*

Ensure each Precast Temporary Barrier Wall Section has permanently clear marking, showing the manufacture date, serial number, and manufacturer's name or symbol and the Department approved drawing number that it meets. The markings may be located on a plate, plaque, or cast in the panel.

521-3.4 Procurement of Precast Temporary Barrier Wall Meeting the Requirements of Index No. 715: *Obtain and use Precast Temporary Barrier Wall from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.*

521-34 Construction.

521-34.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-34.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-34.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-34.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, ~~designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.~~

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-34.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-45 Curing.

~~Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. After removing the form, cure the barrier wall by one of the methods specified in Meet the requirements of 400-16, for the remainder of the 72 hour curing period.~~

———Cure slip formed barrier walls in accordance with 400-16.

521-56 Joints.

521-56.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and

contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-56.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures:

The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-56.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures:

Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-67 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-78 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

Item No. 521- 1-	Concrete Barrier Wall - per foot.
Item No. 2521- 1-	Concrete Barrier Wall - per meter.
Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.



Ghulam Mujtaba
10/15/2003 06:07 AM

To: John H Owens/CO/FDOT@FDOT
cc: Duane F Brautigam/CO/FDOT@FDOT, Jim Mills/CO/FDOT@FDOT,
Robert Robertson/CO/FDOT@FDOT, Richard J
Kessler/SM/FDOT@FDOT
Subject: Re: Section 5210000, 534, 548, and 641 

Good Morning:

John:

I will prepare the origination Form tomorrow. I will leave the office at 6:00 AM and will be back late in the afternoon:

The following are my review comments:

A. Section 521

- 1- Section 521-3.2 The Divide the paragraph into subarticles. The sentence is lengthy and fragmented.**
- 2- Section 521-3.3 The title should also include the Barrier Walls that are cast after Oct 2002. Change it to read: Procurement of Precast Concrete Temporary Barrier Walls Cast On or After October 1, 200 2.**
- 3- Section 521-3.4 Delete 521-3.4 . Section 102-9.5.2 covers this requirement.**
- 4- Section Provide a statement that the products will be accepted based on certification and quality control testing. You have included the same type of statements included in 534, 548, and 641.**

B. Section 534

- 1- Section 534-3 Change ACI to CTQP. Delete "and Assurance". It is not the responsibility of Contractor to perform quality assurance testing.**

C- Section 548

- 1- Sections 548- 1 and 548-2 The Department's qualification list is repeated in both articles.**
- 2- Section 548-1-third sentence "the wall system" has been repeated. Change the second "wall system" to pronoun "it"**
- 3- .Delete "and Assurance". It is not the responsibility of Contractor to perform**

quality assurance testing.

C- Section 548

1- Section 548- 1 Third paragraph - The "wall system" has been repeated. Change the second one to a pronoun "it"..

2- Section 548-3 Delete "and Assurance". It is not the responsibility of Contractor to perform quality assurance testing. Change ACI to "CTQP"

D- Section 641

1- Section 641- 1 Second Paragraph

Change "pole" to "poles"

2- Section 641-3

Change PCI requirements to "PCI quality control personnel and plant certification programs"

Thanks

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CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.
(REV ~~6-26-03~~ ~~7-03~~ ~~7-21-03~~ ~~7-29-03~~ ~~8-19-03~~)

SECTION 321 (Pages 589-591) is deleted and the following substituted:

SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS

521-1 Description.

Construct ~~plain or reinforced~~ *Precast or Cast In Place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete,~~ in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent precast concrete* barrier walls on bridge or box culvert structures.

521-2 Materials.

Meet the following requirements:

Portland Cement Concrete	Section 346
Reinforcing Steel	Section 415
Joint Materials	Section 932

521-3 Precast Temporary Barrier Walls.

521-3.1 General: Meet the requirements of 102-9.5.2.

521-3.2 Cast Prior To October 1, 2002 Roadway Use Only: Use Precast Temporary Barrier Wall when certification is provided to the Engineer that the Precast Temporary Barrier Wall was cast prior to October 1, 2002, meets the requirements of the 200~~X~~ Roadway and Traffic Design Standards Index 415, and the approval of the Engineer.

~~**521-3.3 Cast On or After To October 1, 2002 Roadway Use Only:** Use Precast Temporary Barrier Wall which is permanently marked identifying the manufacturer, date of manufacture and the Department approved drawing number that it meets.~~

3

~~521-3.1~~ **Procurement of New Precast Temporary Barrier Wall: Obtain Precast Temporary**

Barrier Wall from a manufacturing plant that is currently on the Department's list of the qualified Precast Concrete Barrier Wall plants.

~~ADD 634-5 * Ensure each Section is permanently marked with the plant quality control manger's approved quality control stamp, identifying the manufacturer, date of manufacture and the Department approved drawing number that it meets.~~

4
~~521-3.2~~ **Roadway or Structures Use: Use Precast Temporary Barrier Wall meeting the requirements of Structures Standard ^{INDEX} Drawing 715.**

521-34 Construction.

521-34.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-34.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-34.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation

elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-~~5~~⁴². Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. ~~Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.~~ **LEAVE IN**

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 ^{mm}], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-45 Curing.

MEET THE REQUIREMENTS OF
~~Cure cast in place and precast barrier walls for 72 hours by leaving the form in place. During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400-16. After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.~~

~~Cure slip formed barrier walls in accordance with 400-16.~~

521-56 Joints.

521-56.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction

joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-56.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures:

The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-56.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures:

Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-67 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-78 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

Item No. 521- 1-	Concrete Barrier Wall - per foot.
Item No. 2521- 1-	Concrete Barrier Wall - per meter.
Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.

SECTION 521

DRAFT 8-19-03

COMMENTS

By

Ghulam Mujtaba

Paul Mize

And Guy Padgett

August 21, 2003

The following are our comments related to Draft (Version 8-19-03) of 521 specification.

1. There is no need for the addition of the Sub-articles 521-3.1 – 521.3.2.
The note in the Standard Index 415 of 2002 mentions the acceptability criteria for the barrier walls cast prior to or after October 1, 2002. A statement should be added to the proposed specification that “Engineer may accept the barrier walls that were cast prior to January 2004 in accordance with the 2002 Roadway and Traffic Design Standards- Index 415 based on the inspection and manufacturer’s certification. The use of the barrier walls made in accordance with 415 is not allowed on the bridge or box culvert structures.”
The acceptability criteria have been noted in the referenced drawing.

2. The sub-article 102-9.5.2 has given reference to 415 only. Instead it should mention Standard Indices 415 and 715.

3. Sub-articles 521-3.3 and 3.4 The same information regarding identification marks are repeated in both sub-articles.

4. Sub-article 521-3.4 Drawing Numbers have been used in lieu of Index numbers.

5. Section 521-1 has mentioned herein referred to as barrier walls. The term “barrier walls” should be used, unless there is a need for specific type of the barrier walls.

6. Section 521-5 Curing- Since the year 2004 version of the specification provides the detailed curing method. Reference should be given to Section 400-16 in lieu of the detailed explanation in 521-5.

7. Section 521-3 The term “permanently marked” has been mentioned. The ink stamp mark may not stay permanently.

8. Section 521-4.3 Slip Form: In the second paragraph, delete third sentence. It is the repeat of the previous sentence.

9. Section 521-4.3 Slip Form –Fourth paragraph- Change 3/8 inch [10 m] to 3/8 inch [10 mm].

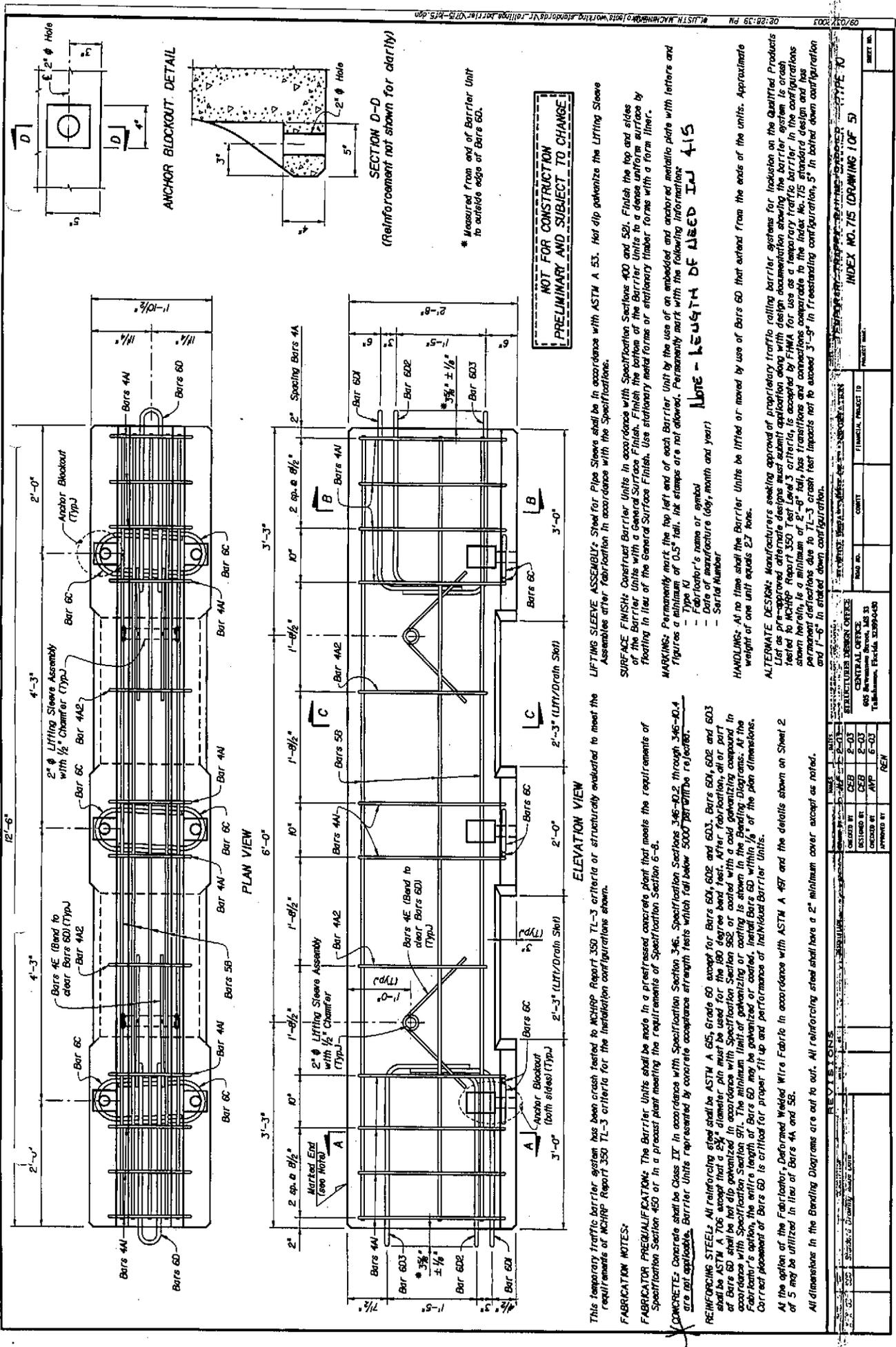
10. Section 521-6.3 Expansion Joints - This sub-article mentions the “non-reinforced barrier wall”. There is no standard for the “non-reinforced barrier walls”.

11. Section 521-4.3 First paragraph- First sentence. Delete the part of the sentence starting with “designed to form and consolidate.....Documents”.

12. Section 521-4.3 Slip Form Third paragraph, The reference to Section 521-3.1 may need to be changed.

13. Section 521-6 Joint- First Sentence: Delete the part of the sentence starting with “..either mounted on or.....or adjoining structures”. The first sentence mentions contract documents and the last sentence mentions plans.

14. Section 521-6.3 has mentioned sawing of plastic concrete.



SECTION D-D
(Reinforcement not shown for clarity)

* Measured from end of Barrier Unit to outside edge of Bars 6D.

NOT FOR CONSTRUCTION
PRELIMINARY AND SUBJECT TO CHANGE

Note - Length of Used IJ 415

LIFTING SLEEVE ASSEMBLY: Steel for Pipe Sleeves shall be in accordance with ASTM A 53. Hot dip galvanize the Lifting Sleeve Assemblies after fabrication in accordance with the Specifications.

SURFACE FINISH: Construct Barrier Units in accordance with Specification Sections 400 and 524. Finish the top and sides of the Barrier Units with a General Surface Finish. Finish the bottom of the Barrier Units to a dense uniform surface by floating in lieu of the General Surface Finish. Use stationary metal forms or stationary timber forms with a form liner.

MARKING: Permanently mark the top left end of each Barrier Unit by the use of an embedded and anchored metallic plate with letters and figures a minimum of 0.5" tall. Ink stamps are not allowed. Permanently mark with the following information:

- Type IJ
- Fabricator's name or symbol
- Date of manufacture (day, month and year)
- Serial Number

HANDLING: At no time shall the Barrier Units be lifted or moved by use of Bars 6D that extend from the ends of the units. Approximate weight of one unit equals 27 tons.

ALTERNATE DESIGN: Manufacturers seeking approval of proprietary traffic rolling barrier systems for inclusion on the Qualified Products List as pre-approved alternate designs must submit application along with design documentation showing the barrier system to crash test to MCHRP Report 350 Test Level 3 criteria. It is accepted by FHWA for use as a temporary traffic barrier in the field. The shown herein, is a minimum of 2'-0" tall, has transitions and connections comparable to the Index No. 715 standard design and has permanent deflections due to TL-3 crash test impacts not to exceed 3'-9" in freestanding configuration, 5" in batter down configuration and 1'-6" in stacked down configuration.

ELEVATION VIEW

This temporary traffic barrier system has been crash tested to MCHRP Report 350 TL-3 criteria or structurally evaluated to meet the requirements of MCHRP Report 350 TL-3 criteria for the installation configurations shown.

FABRICATION NOTES:

As the option of the Fabricator, Deformed Welded Wire Fabric in accordance with ASTM A 497 and the details shown on Sheet 2 of 5 may be utilized in lieu of Bars 4A and 5B.

CONCRETE: Concrete shall be Class IX in accordance with Specification Section 346. Specification Sections 346-40.2 through 346-40.4 are not applicable. Barrier Units represented by concrete acceptance strength tests which fall below 5000 psi will be rejected.

REINFORCING STEEL: All reinforcing steel shall be ASTM A 65, Grade 60 except for Bars 60A, 60B and 60C. Bars 60A, 60B and 60C shall be ASTM A 706 except that a 24" diameter pin must be used for the 180 degree bend test. After fabrication, all or part of Bars 6D shall be hot dip galvanized in accordance with Specification Section 982 or coated with a cold galvanizing compound in accordance with Specification Section 971. The minimum limit of galvanizing or coating is shown in the Bending Diagrams. At the Fabricator's option, the entire length of Bars 6D may be galvanized or coated. Inset Bars 6D within 1/8" of the plan dimensions. Correct placement of Bars 6D is critical for proper fit-up and performance of individual Barrier Units.

All dimensions in the Bending Diagrams are set out. All reinforcing steel shall have a 2" minimum cover except as noted.

REVISE		REVISIONS		REVISIONS	
NO.	DATE	BY	CHKD.	NO.	DATE
1	02-03-00	CEB	2-03	1	02-03-00
2	02-03-00	CEB	2-03	2	02-03-00
3	02-03-00	APP	6-03	3	02-03-00

DESIGNED BY: [Name] CHECKED BY: [Name] DRAWN BY: [Name] PROJECT NO.: [Number] SHEET NO.: [Number]

INDEX NO. 715 (DRAWING 1 OF 5)

NOTES FOR ALL INSTALLATIONS:

LIMITATION OF USE: This Temporary Traffic Railing Barrier is intended for work zone traffic control and other temporary applications. It shall not be used for permanent traffic railing barrier construction unless specifically permitted by the Plans. The Barrier Units must be installed on a flexible pavement (asphalt) or rigid pavement (concrete) surface as shown with a cross slope of 1/80 or flatter.

HANDLING: At no time shall the Barrier Units be lifted or moved by use of Bars 6D that extend from the ends of the units. Approximate weight of one unit equals 27 tons.

SURFACE PREPARATION: Remove all debris, loose dirt and sand from the pavement, bridge deck or Asphalt Pad surface within the barrier footprint just prior to placement of the Barrier Units.

CONNECTION PIN ASSEMBLY: Steel for Connection Pin and Top Plate assemblies shall be in accordance with ASTM A36 or ASTM A709 Grade 36. Nondestructive testing of welds shall not be required. At the Contractor's option, a 3/8" diameter hole may be provided at the bottom of the Connection Pin, as shown, for the installation of a wad of resistance ball.

INSTALLATION: Set Barrier Units by using a 3/8" wooden block between ends of adjacent units. Install Connection Pins between adjacent Barrier Units as shown. Barrier units shall not be used unconnected.

DELINEATION: Mount Type C Steady-Burn Lights on top of Barrier Units that are used as traffic barriers along travel ways in work zones. Space the lights at 50' centers in transitions, 100' centers on curves and 200' centers on tangent alignments. Refer to "Warning Lights" on Design Standards Index No. 600 for additional information.

REUSE OF UNITS: Barrier Units may be reused provided they have the structural integrity and surface qualities of new units. Do not use Barrier Units without marking plates.

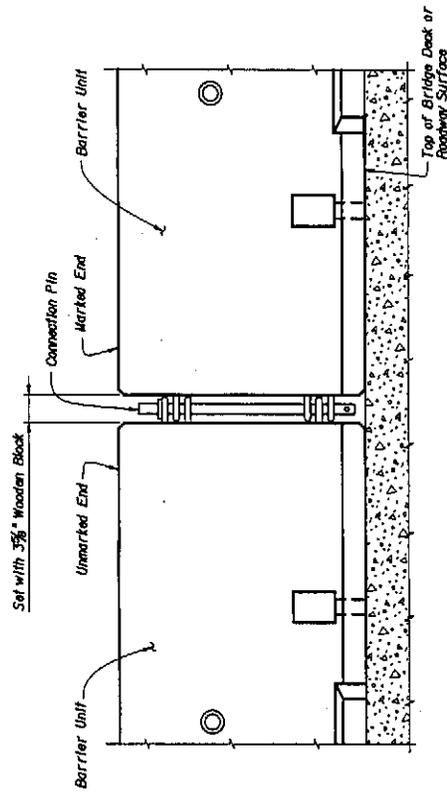
INSTALLATIONS ON CURVED ALIGNMENTS: The details presented in these Standards are shown for installations on tangent alignments. Details for horizontally curved alignments are similar.

TRANSITIONS: Transitions are required between freestanding, bolted down and staked down installations. See Interim Design Standards Index No. 415 dated 7-01-03 for transition requirements and details.

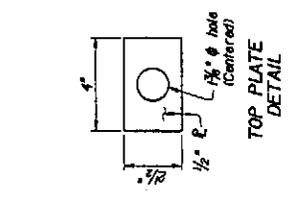
PAVEMENT: Barrier Units for work zone traffic control and other temporary applications shall be paid for under the contract unit price for Barrier Wall (Temporary) (Type K), LF. Any relocation of the Barrier Units required for the project shall be paid for under the contract unit price for Barrier Wall (Temporary) (Recoat) (Type K), LF, Type C Steady-Burn Lights shall be paid for under the contract unit price for Lights (Temp. Barrier Wall Mount) (Type C, Steady Burn), ED.

The Contractor shall furnish Barrier Units except when the Plans stipulate the availability of Department owned units. Regardless of unit source the Contractor shall furnish all hardware and shall be responsible for all handling, including loading, transport, unloading, stockpiling, installation, removal and return. Unless otherwise noted on the Plans, the Barrier Units shall become the property of the Contractor and shall be removed from the site prior to acceptance of the completed project.

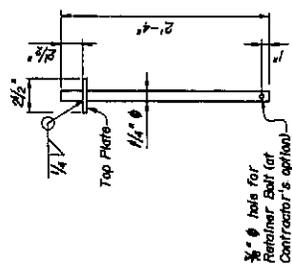
NOT FOR CONSTRUCTION
PRELIMINARY AND SUBJECT TO CHANGE



DETAIL OF CONNECTION BETWEEN RAILING UNITS

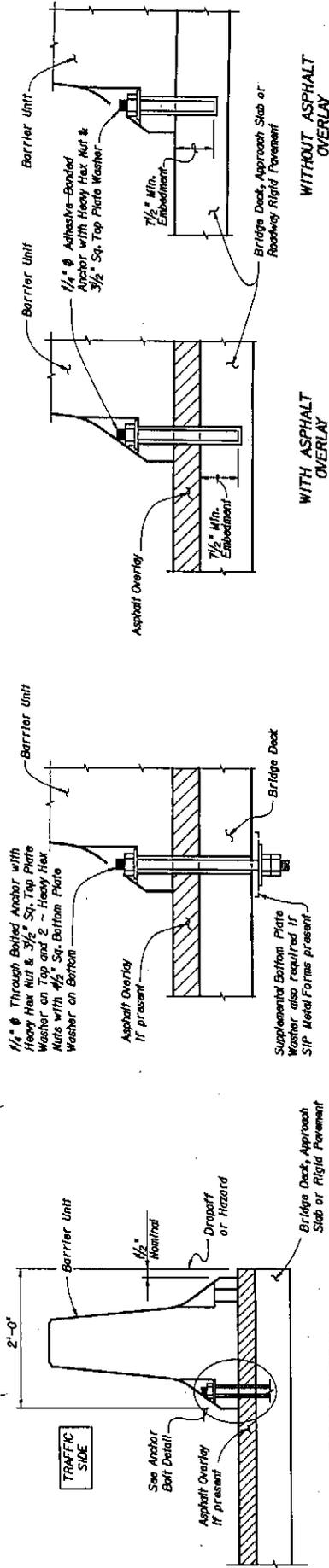


**TOP PLATE
DETAIL**



**CONNECTION PIN
DETAIL**

PROJECT NO. 08-28-29 PM	DRAWING NO. 07-30-25	SHEET NO. 1	INDEX NO. 715 (DRAWING 3 OF 5)	TEMPORARY TRAFFIC BARRIERS (TYPE K)
FEDERAL DEPARTMENT OF TRANSPORTATION				
ROAD NO.	COUNTY	TOWN/CITY	PROJECT NAME	SHEET NO.
CONTRACT NO.				
STRUCTURES DESIGN OFFICE CENTRAL OFFICE 405 Severn Avenue, MD 20 Takoma Park, MD 20910-0000				
DATE	BY	CHECKED BY	APPROVED BY	REV
08-28-29 PM	CEB	CEB	AVP	REN
REVISIONS				
NO.	DATE	DESCRIPTION		
1	08-28-29 PM	Standard Drawing Issue Form		



TYPICAL SECTION
(BRIDGE DECK SLAB, APPROACH SLAB
OR RIGID PAVEMENT SIMILAR)

NOTES FOR BOLTED DOWN BRIDGE, APPROACH SLAB, ROADWAY AND TRANSITION INSTALLATIONS:

LIMITATION OF USE: This installation technique can only be used on rigid pavement and concrete bridge decks as shown. Barrier Units shall not be bolted down on bridge superstructures that contain post-tensioned tendons within the concrete deck (top flange of concrete girders) or on bridge superstructures consisting of longitudinally prestressed, transversely post-tensioned, solid or voided concrete slab units. Anchor Bolts must not be installed on both sides of the Barrier Units.

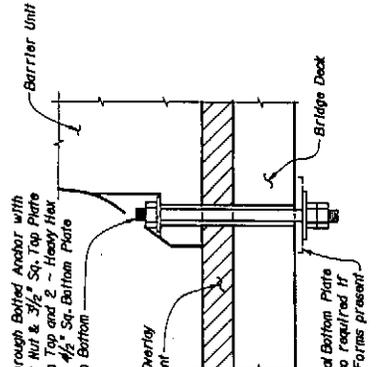
ANCHOR BOLTS, NUTS AND WASHERS: Adhesive-Bonded Anchor Bolts shall be fully threaded rods in accordance with ASTM F 1554 Grade 36. Anchor Bolts for through bolting shall be in accordance with ASTM A 307 or ASTM F 1554 Grade 36. Nuts shall be in accordance with ASTM A 563 or ASTM A 594. Flat Washers shall be in accordance with ASTM F 436 and Plate Washers shall be in accordance with ASTM A 36 or ASTM A 709 Grade 36.

Install three (3) Anchor Bolts per Barrier Unit on the traffic side of the Barrier Units as shown in Transition Installations. For the number of Anchor Bolts required in Transition Installations see Interim Design Standards Index No. 045. Drilling through deck reinforcing steel to install Anchor Bolts is permitted. Unless otherwise shown in the Plans, at the Contractor's option Barrier Units may be installed by through bolting (where geometrically possible) or by the use of Adhesive-Bonded Anchor Bolts. Do not drill into or otherwise damage the top of supporting beams or girders, bridge deck expansion joints or drains. Install Anchor Bolts and Nuts so that the maximum extension beyond the face of the Barrier Units is 1/2". Swing tighten the Nuts on the Anchor Bolts. For through bolted installations, swing tighten the double Nuts on the underside of the deck against each other to minimize the potential for loosening.

Omni one (1) Anchor Bolt within a single Barrier Unit if a conflict exists between the Anchor Bolt location and a bridge deck expansion joint or drain. The adjacent Barrier Units must each be installed with the standard three (3) Anchor Bolts. Omni one (1) Anchor Bolt within a single Barrier Unit as shown in the Treatment at Bridge Deck Expansion Joint Schematic if the Barrier Unit straddles a bridge deck expansion joint. The adjacent Barrier Units must each be installed with the standard three (3) Anchor Bolts.

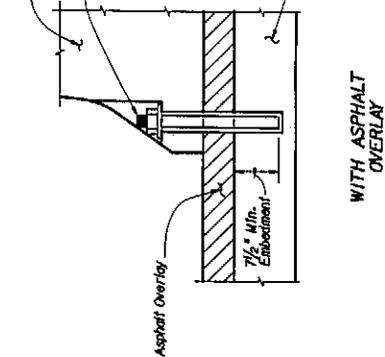
ADHESIVE-BONDING MATERIAL SYSTEMS: Adhesive Bonding Material Systems for Anchor Bolts shall be Type HSRV in accordance with Specification Section 537 and shall be installed in accordance with Specification Section 405. Prior to installation of the Barrier Units in the plan location, the Engineer shall determine the location of the proposed production of the Barrier Units in the plan location. The Engineer shall determine the location of the proposed production of the Barrier Units in the plan location. The Engineer shall determine the location of the proposed production of the Barrier Units in the plan location. The Engineer shall determine the location of the proposed production of the Barrier Units in the plan location.

REMOVAL OF ANCHOR BOLTS: Upon removal or relocation of Barrier Units, remove all Anchor Bolts and completely fill the remaining holes in bridge decks, approach slabs and roadway rigid pavements that are to remain with Magnesium Anhydrous Phosphate Concrete in accordance with Specification Section 930 or with an Epoxy Resin Compound, Type I or G, in accordance with Specification Section 926. If a flexible pavement overlay is present and is to remain, completely fill the remaining holes in the flexible pavement with hot or cold patch asphalt material.

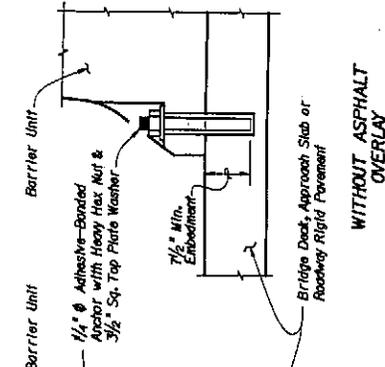


THROUGH BOLTED ANCHOR
INSTALLATION ON BRIDGE DECK

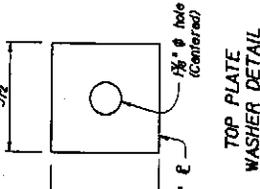
Dimension as required to open SIP Metal Form Carriageways plus 1/2" Min. overlap each side.



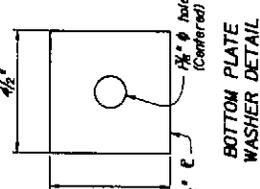
ADHESIVE BONDED ANCHOR INSTALLATION ON
BRIDGE DECK, APPROACH SLAB OR RIGID PAVEMENT



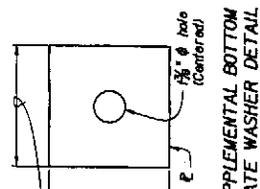
WITHOUT ASPHALT
OVERLAY



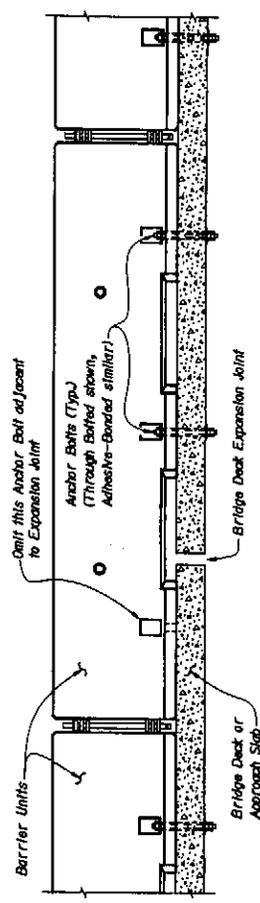
TOP PLATE
WASHER DETAIL



BOTTOM PLATE
WASHER DETAIL



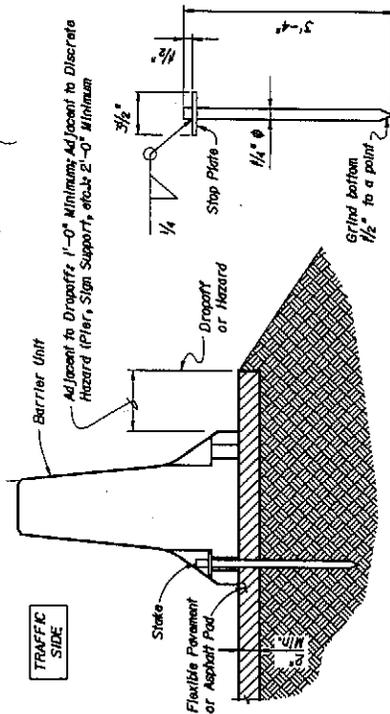
SUPPLEMENTAL BOTTOM
PLATE WASHER DETAIL



TREATMENT AT BRIDGE DECK EXPANSION JOINT SCHEMATIC

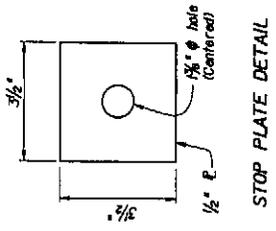
BOLTED DOWN BRIDGE, APPROACH SLAB, ROADWAY AND TRANSITION INSTALLATIONS

DATE: 7-23-03		SCALE: 1/4" = 1'-0"		SHEET NO.:	
DRAWN BY: SCD		CHECKED BY: SCD		PROJECT NAME:	
DESIGNED BY: CEB		APPROVED BY: AWP		PROJECT NO.:	
CALCULATED BY: CEB		DATE: 2-03		DRAWING NO.:	
REVISIONS:		DATE: 6-03		PROJECT NO.:	
1		2		3	
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10		11		12	
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TYPICAL SECTION

STAKE DETAIL



NOTES FOR STAKED DOWN ROADWAY TRANSITION INSTALLATION:

LIMITATION OF USE: This installation technique can only be used on flexible pavement or an Asphalt Pad as shown.

ASPHALT PADS: Where existing flexible pavement is not present, construct the Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. Install the Miscellaneous Asphalt Pavement at the rate of 100 pounds per square yard per inch thickness of pad. No separate payment will be made for the Asphalt Pad.

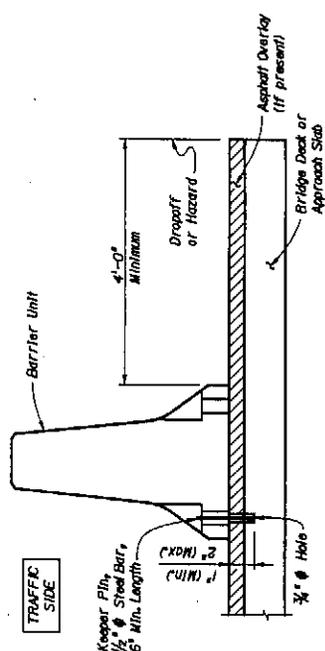
STAKES: Provide steel for Stake assemblies in accordance with ASTM A 36 or ASTM A 709 Grade 36. All welding shall be in accordance with the American Welding Society Structural Welding Code (Steel) AWS/AWS D11.1 (aircraft edition). Weld metal shall be E60XX or E70XX. Nondestructive testing of welds is not required.

INSTALL STAKES ON THE TRAFFIC SIDE OF THE BARRIER UNITS AS SHOWN. SEE INTERIM DESIGN STANDARDS INDEX NO. 0445 FOR THE NUMBER OF STAKES REQUIRED IN EACH BARRIER UNIT. INSTALL STAKES SO THAT THE STOP PLATE IS ENJOY AGAINST THE BOTTOM OF THE ANCHOR BOLT.

BURIED UTILITIES: Prior to installation of Stakes verify locations of all adjacent buried utilities, drainage structures, pipes, etc. If conflicts between Stake locations and buried elements exist, a maximum of two (2) Stakes within a single Barrier Unit may be omitted if the adjacent Barrier Units are installed with the standard three (3) Stakes.

REMOVAL OF STAKES: Upon removal or relocation of Barrier Units, completely remove all Stakes and completely fill the remaining holes in flexible pavement that is to remain with hot or cold patch asphalt material.

STAKED DOWN ROADWAY TRANSITION INSTALLATION



TYPICAL SECTION (BRIDGE DECK SHOWN, APPROACH SLAB SIMILAR)

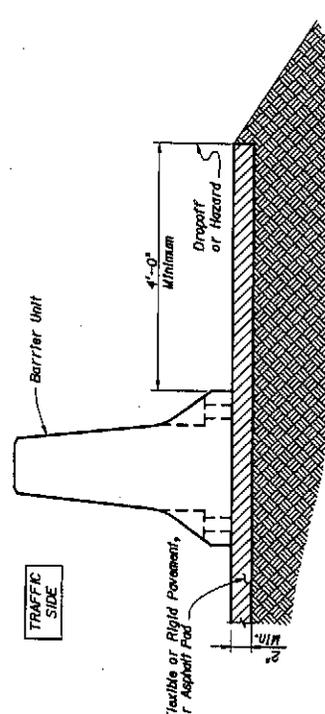
NOTES FOR FREE STANDING BRIDGE OR APPROACH SLAB INSTALLATION:

KEEPER PINS: Keeper Pins shall be 1/2" diameter, smooth ended bar in accordance with ASTM A 36 or ASTM A 709 Grade 36.

As directed by the Engineer in order to limit vibration induced translation of the Barrier Units, install one (1) Keeper Pin per Barrier Unit on the traffic side of the Barrier Units as shown. Do not drill into or otherwise damage bridge deck expansion joints or drains.

REMOVAL OF KEEPER PINS: Upon removal or relocation of Barrier Units, remove all Keeper Pins and completely fill the remaining holes in bridge decks and approach slabs that are to remain with Magnesium Ammonium Phosphate Concrete in accordance with Specification Section 930 or with an Epoxy Resin Compound, Type I or II in accordance with Specification Section 906. If a flexible pavement overlay is present and is to remain, completely fill the remaining holes in the flexible pavement with hot or cold patch asphalt material.

FREESTANDING BRIDGE OR APPROACH SLAB INSTALLATION



TYPICAL SECTION

NOTES FOR FREE STANDING ROADWAY INSTALLATION:

LIMITATION OF USE: This installation technique can only be used on flexible or rigid pavement or on an Asphalt Pad as shown.

ASPHALT PADS: Where existing pavement is not present, construct the Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. Install the Miscellaneous Asphalt Pavement at the rate of 100 pounds per square yard per inch thickness of pad. No separate payment will be made for the Asphalt Pad.

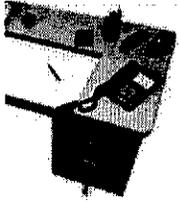
FREESTANDING ROADWAY INSTALLATION

DATE	BY	REVISIONS	ISSUED BY	DATE	APPROVED BY
02-29-03
PROJECT NO. 05 COUNTY DISTRICT NO. 13 TOLSON, Florida 32550-000			PROJECT NAME INDEX NO. 15 (DRAWING 5 OF 5)		

K-wall Meeting

9/10/03

Name	Company	Telephone
David Sadler	FDOT-SCO	850-414-5203
John Owens	" SPEC	850-414-4113
Larry Paul	STANDARD CONCRETE PRODUCTS	813 831-9520
John Jarrett	Delta-stress	352-777-1122
Tom Mills	FDOT Roadway Design	850-414-4313
Lynda Richards	Richards Concrete Products	313 531-2734
Robert Robinson	DOT-SSDO	352-777-2257
Pat McWhorter	Seminole Precast Ltd	352 753 1800
Dilbert H. Nickels	DOT - Structures	850-414-4560
Joe E. Hill	JE HILL CONTRACTORS	352-732-5371
Walter E. Hill	JE Hill Contractors	352-732-5377
Brian Stork	ASST. SEC. GEN.	703 373-9973
Bob Burdson	FTBA	352-942-1404
Ananth Prasad	FDOT-SCO	352-414-4140
Martin Kaszowich	Seminole Precast Ltd	352-753-1800
Charles Boyd	FDOT-SSDO	



Duane F Brautigam
08/26/2003 09:53 AM

To: John H Owens/CO/FDOT@FDOT
cc: Clinton Shaw/CO/FDOT@FDOT, William N
Nickas/CO/FDOT@FDOT, Ghulam Mujtaba/SM/FDOT@FDOT,
Robert Robertson/CO/FDOT@FDOT, Paul
Harkins/CO/FDOT@FDOT

Subject: Re: K-Rail

John - Please keep in touch with the players and informed on this so we know where this ship is headed, and any associated spec implications.

Thanks - DFB

Duane F. Brautigam, P.E.
State Specifications Engineer
Florida Department of Transportation
(850) 414-4130; SC 994-4130
duane.brautigam@dot.state.fl.us

----- Forwarded by Duane F Brautigam/CO/FDOT on 08/26/2003 09:49 AM -----

William N Nickas
08/25/2003 08:54 PM

To: Ghulam Mujtaba/SM/FDOT@FDOT
cc: Ananth Prasad/CO/FDOT@FDOT, Brian A
Blanchard/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
David Sadler/CO/FDOT@FDOT, Duane F
Brautigam/CO/FDOT@FDOT, Guy Padgett/SM/FDOT@FDOT, Jim
Mills/CO/FDOT@FDOT, Joe C Tolleson/SM/FDOT@FDOT, Paul
Mize/SM/FDOT@FDOT, Richard J Kessler/SM/FDOT@FDOT,
Robert Robertson/CO/FDOT@FDOT, Steve I
Plotkin/CO/FDOT@FDOT, Tom O Malerk/SM/FDOT@FDOT

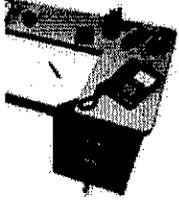
Subject: Re: K-Rail 

Gulam/Robert

If this product is a proprietary design that has a QPL pledge behind it you may have a point. If it is our design and we are taking it like we do strain poles on certifications then these barriers need paperwork tied to serial number that are loaded in to the material certs that can pull the plug on an plants QC Plan and the inspectors CTQP quals for future FDOT Work. This is more that a culvert or a slab. This life safety item has no secondary load path live a beam.....

Nedra please set up a teleconference with Gulam and I next week. I am sure Gulam can guide this ship into the "New era" but with appropriate assurances...

William N. Nickas, P.E.
State Structures Design Engineer
Florida Department of Transportation
William.Nickas@dot.state.fl.us
(850) 414-4255
www11.myflorida.com/structures/default.htm
Ghulam Mujtaba



Ghulam Mujtaba

08/19/2003 01:02 PM

To: Robert Robertson/CO/FDOT@FDOT
cc: Ananth Prasad/CO/FDOT@FDOT, Brian A
Blanchard/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
David Sadler/CO/FDOT@FDOT, Duane F
Brautigam/CO/FDOT@FDOT, Guy Padgett/SM/FDOT@FDOT, Jim
Mills/CO/FDOT@FDOT, Joe C Tolleson/SM/FDOT@FDOT, Paul
Mize/SM/FDOT@FDOT, Richard J Kessler/SM/FDOT@FDOT,
Steve I Plotkin/CO/FDOT@FDOT, Tom O
Malerk/SM/FDOT@FDOT, William N Nickas/CO/FDOT@FDOT

Subject: Re: K-Rail 

Robert:

The specification 450 may need to be modified, in case if the barrier walls are going to be fabricated in accordance with 450 specifications. There are conflicts between Section 450, 521 and 400 specifications. The 450 specifications is written mainly for the manufacturing of the prestressed concrete products.

The department verification inspectors perform the quarterly inspections and testing of the precast concrete pipes and precast concrete drainage structures plants, when the products are manufactured in accordance with the applicable ASTM standards. This is in addition to the required quality control testing and inspections that are being performed by the plants. The manufactures of these products are required to comply with the 346 specification requirements, when the plants require 346 class of concrete. The plants are also required to have department approved quality control plans.

It should be noted that department inspectors only perform random sampling and inspections at the prestressed concrete plants. The quality control tests are performed by the producers the products.

I agree that the fabrication of the Type K temporary barrier walls , Index 715, is critical to the life and safety of the public. The same type of safety requirements are applicable to other manufactured concrete products, whether they are beams, slabs, pipes, culverts or any other structures.

Ghulam Mujtaba, P.E., C.P.M.
State Prestressed Concrete Engineer
Florida Department of Transportation
5007 N.E. 39th Avenue
Gainesville, Florida 32609
Phone: (352) 955-6685
SC 625-6685

Fax: (352) 955-6689
E-Mail: ghulam.mujtaba@dot.state.fl.us
Robert Robertson



Robert Robertson
08/19/2003 08:16 AM

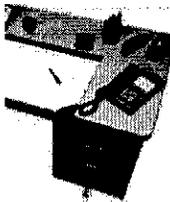
To: Ghulam Mujtaba/SM/FDOT@FDOT
cc: Ananth Prasad/CO/FDOT@FDOT, Brian A
Blanchard/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
David Sadler/CO/FDOT@FDOT, Ghulam
Mujtaba/SM/FDOT@FDOT, Guy Padgett/SM/FDOT@FDOT, Jim
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Mize/SM/FDOT@FDOT, Richard J Kessler/SM/FDOT@FDOT,
Steve I Plotkin/CO/FDOT@FDOT, Tom O
Malerk/SM/FDOT@FDOT, William N Nickas/CO/FDOT@FDOT,
Duane F Brautigam/CO/FDOT@FDOT

Subject: Re: K-Rail 

This issue has been going around for a while and I am not sure we are all moving in the same direction. The Type K barrier, Index 715, is critical to the life and safety of the public using our facilities. During development of the standard, the SDO decided that to assure the total compliance with the standard that the Dept must inspect this product and also must use concrete meeting the requirements of 346 to assure performance. Since drainage products are not inspected by DOT and do not utilize 346 concrete, the SDO decided the fabrication be in accordance with 450 and 346. The states prestress plants are the only location known to us that can meet the material and inspection requirements. These plants are fully inspected and utilize 346 concrete. We do not feel that this product should be fabricated in plants without DOT inspection or 346 concrete.

Duane, the proposed 521 spec should be placed on hold until these differences in direction are resolved.

Robert Robertson
FDOT Tallahassee Structures
SC 994-4267
(850) 414-4267
Ghulam Mujtaba



Ghulam Mujtaba
08/18/2003 05:35 PM

To: David Sadler/CO/FDOT@FDOT
cc: Jim Mills/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
Ghulam Mujtaba/SM/FDOT@FDOT, William N
Nickas/CO/FDOT@FDOT, Brian A Blanchard/CO/FDOT@FDOT,
Ananth Prasad/CO/FDOT@FDOT, Steve I
Plotkin/CO/FDOT@FDOT, Richard J Kessler/SM/FDOT@FDOT,
Guy Padgett/SM/FDOT@FDOT, Paul Mize/SM/FDOT@FDOT, Joe
C Tolleson/SM/FDOT@FDOT, Robert Robertson/CO/FDOT@FDOT,
Richard J Kessler/SM/FDOT@FDOT, Tom O
Malerk/SM/FDOT@FDOT

Subject: Re: K-Rail 

Dave:

I agree with the responses that Jim Mills sent on August 15, 2003 and add the following:

1- The current specification does not require plant certification for barrier walls. Upon the implementation of the modified specifications, the contractors will be required to obtain the precast concrete products from department qualified precast concrete plants. I recommend that the language regarding the marking requirements in Index 715 and 521 should agree with each other. The marking should be required to trace the products to the materials used in the manufacturing of the products, including the reinforcing steel, batched concretes, and their materials ingredients.

2-. The 72-hour curing time will add to the durability of concrete. The 12-hour form curing has been mentioned to prevent the damage of concrete during removal of forms. The concrete strength development depends on the type of concrete ingredients and curing process. In case of fly ash concrete or blast furnace slag it may take longer than the concrete without those materials. The accelerated curing process will shorten the curing time. I recommend that 521-4 should be modified allow removal of forms prior to 12 hours, provided that the concrete has sufficient strength to avoid damage during the removal of forms.

3- I recommend that the 450 specification requirements should be changed. The manufacturers should be allowed to cast their products in the qualified prestressed concrete or non-prestressed concrete plants.

Please advise if there are any questions.

Ghulam Mujtaba, P.E., C.P.M.
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Gainesville, Florida 32609
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David Sadler



David Sadler

08/14/2003 11:19 AM

To: Jim Mills/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
Ghulam Mujtaba/SM/FDOT@FDOT, William N
Nickas/CO/FDOT@FDOT, Brian A Blanchard/CO/FDOT@FDOT
cc:

Subject: K-Rail

These are some of the things industry wants to discuss with us at the meeting on September 3rd in the Burns Building. Any comments on this are appreciated.

Please let me know if you have any questions.

David A. Sadler, P.E.

Construction Engineer

(850)414-5203, SC 994-5203

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userid: cn982da email: david.sadler@dot.state.fl.us

----- Forwarded by David Sadler/CO/FDOT on 08/14/2003 11:16 AM -----



"Bob Burleson"
<bburleson@ftba.com>

08/14/2003 09:39 AM

To: "David Sadler (E-mail)" <david.sadler@dot.state.fl.us>, "Ananth Prasad (E-mail)" <Ananth.Prasad@dot.state.fl.us>

cc:
Subject: K-Rail



K-Rail.doc

The following are concerns industry has with the proposed "K-Rail" design:

1. Section 521, Paragraph 2, *Obtain precast concrete barrier walls from a manufacturing plant currently certified by the Department to produce precast concrete barrier walls. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from manufacturer.*

There is no certification currently required by the Department to manufacture barrier wall. The QC stamp seems excessive for a temporary item, especially with the quantities involved.

2. 521-4 Curing. *Cure cast in place and precast walls for 12 hours by leaving the form in place.*
It is common for precast manufacturers to "double cycle" forms in a day. This normally can be accomplished in 4-6 hours under controlled practices.
3. Index No. 715 Drawing 1 of 5. *Fabricator Prequalification: The Barrier Units shall be made in a prestressed concrete plant that meets the requirements of Specification Section 450.* This is not a prestressed item, why does it need to be manufactured by a prestresser?
4. Lifting Sleeve Assembly: These are not used currently in barrier manufactured in Florida, is this optional or required?
Marking: This seems excessive for a temporary item, especially with the quantities involved.
5. Alternate design: Requires crash testing, but this design has not been crash tested as of yet.
6. Drawing 3 of 5: Limitations of use: *The Barrier Units must be Installed on a flexible pavement (asphalt) or rigid pavement (concrete) surface as shown with a cross section slope of 1:10 of flatter.* Many applications of temporary barrier have the barrier installed on the grass or dirt shoulder of the roadway.
7. Drawing 4 of 5: Limitation of Use: This anchor system cannot be used on post-tensioned or prestressed bridge decks. What can be used?
8. Drawing 4 of 5: Use of Adhesive-Bonded Anchor Bolts, removal will cause damage to bridge decks. Can alternate Anchors be used.



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: July 21, 2003

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer

SUBJECT: **Proposed Specifications Change – D5210000 – Concrete Barriers, Traffic Railing Barriers and Parapets.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Concrete Barriers, Traffic Railing Barriers and Parapets.

This change was proposed by Ghulam Mujtaba, State Materials Office to address the qualification of the plants that are manufacturing precast concrete barrier walls for department projects.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after August 18, 2003 may not be considered. Your input is encouraged.

DFB/jho

Attachment

COMMENTS:

Submitted by:

Phone #:

CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.

(REV ~~6-26-03~~ 7-037-21-03)

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ *precast or cast in place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete,~~ in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent* precast concrete barrier walls on bridge or box culvert structures. *Ensure that all Temporary barrier walls must also meet the requirements of Section 102 Index No. 415.*

Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified currently certified by the Department to produce precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

521-2 Materials.

Meet the following requirements:

- Portland Cement Concrete Section 346
- Reinforcing Steel..... Section 415
- Joint Materials..... Section 932

521-3 Construction.

521-3.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-3.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-3.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation

elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-3.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 m], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-4 Curing.

Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. *During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400-16.* After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.

Cure slip formed barrier walls in accordance with 400-16.

521-5 Joints.

521-5.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-5.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-5.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-6 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

Item No. 521- 1-	Concrete Barrier Wall - per foot.
Item No. 2521- 1-	Concrete Barrier Wall - per meter.
Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND
PARAPETS.
(REV 6-26-037-7-037-21-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ *precast or cast in place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete~~, in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent* precast *concrete* barrier walls on bridge or box culvert structures. *Ensure that all Temporary barrier walls must also meet the requirements of Section 102 Index No. 415. Use of precast walls cast prior to October 1, 2002 requires certification from the producer that the walls were cast prior to October 1, 2002 and are in compliance with Design Standard Index.*

Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified currently certified by the Department to produce precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

**102 MAINTENANCE OF TRAFFIC – BARRIER WALL (TEMPORARY).
(REV 6-10-03) (FA 6-13-03) (1-04)**

SUBARTICLE 102-9.5.2 (Page 108) is deleted and the following substituted:

102-9.5.2 Barrier Wall (Temporary): Furnish, install, maintain, remove and relocate a temporary barrier wall in accordance with the plans. Temporary concrete barrier wall, for use on roadway sections, will be in accordance with Index No. 415. Temporary water filled barrier wall used on roadway sections will be in accordance with Index No. 416. Proprietary barrier walls for use on roadway sections must meet NCHRP Report 350 criteria and be identified on the QPL. Temporary concrete barrier wall for use on bridge and wall sections, will be in accordance with Structures Index No. 715. Barriers meeting the requirements of Index Nos. 415 or 416 will not be accepted as an alternate to barriers meeting the requirements of Index No. 715.

SUBARTICLE 102-10.1 (Pages 111 and 112) is deleted and the following substituted:

102-10.1 Description: Furnish and install Work Zone Pavement Markings for maintenance of traffic in construction areas and in close conformity with the lines and details shown on the plans. Meet the requirements of 710-4.3.

Use only pavement marking materials that do not contain any lead or chromium compounds. Manufacturers seeking product approval must furnish certified test reports showing the Work Zone Pavement Marking material meets the requirements of this Section.

Centerlines, lane lines, edgelines, stop bars and turn arrows in work zones will be required in accordance with the MUTCD with the following additions:

- (a) Install edgelines on paved shoulders.
- (b) Place edgelines on all detours where vehicle paths are altered from normal operations and where a lane is narrowed from its normal width for any reason.
- (c) Apply Work Zone Pavement Markings, including arrows and messages as determined by the Engineer to be required for the safe operation of the facility, before the end of the day if the highway is open to traffic. Channelizing devices may be used to direct traffic during the day before placing the Work Zone Pavement Markings.
- (d) Work Zone Pavement Markings will be designated in the plans or by the Engineer as removable or non-removable.

Removable Work Zone Pavement Markings consists of materials that can be taken up by hand such as preformed removable pavement marking film (Tape).

Non-Removable Work Zone Pavement Markings consists of markings that are not classified as removable such as paint or preformed non-removable pavement marking film (Tape).

Use of Removable or Non-Removable Work Zone Pavement Markings are as follows:

Application	Category
Finish Pavement*	
All stripes representing final pavement markings	Non-Removable
All stripes in an area where the traffic pattern will be altered before project acceptance	Removable
Intermediate Pavement Course	

Application	Category
All stripes in pavement areas that will be covered with a subsequent course of pavement before altering of the traffic pattern within such area.	Non-Removable
All stripes where the traffic pattern will be altered before placing of the subsequent paving course within such area.	Removable
Existing Pavement	
All stripes that will be removed or overlaid with new pavement before altering the traffic pattern within such area.	Non-Removable
All stripes where the traffic pattern will be altered before removal or overlaying of such area.	Removable
*Place striping representing final markings in the permanent location unless excepted in writing by the Engineer.	

SUBARTICLE 102-11.22 (Page 115) is deleted and the following substituted:

102-11.22 Work Zone Pavement Markings: The quantities, furnished and installed, to be paid for will be the length of skip and solid pavement markings, and the area of pavement markings placed as follows:

(a) The total transverse distance, in feet [meters], of skip pavement marking authorized and acceptably applied. The length of actual applied line will depend on the skip ratio of the material used. Measurement will be the distance from the beginning of the first stripe to the end of the last stripe with proper deductions made for unpainted intervals as determined by plan dimensions or stations, subject to 9-1.3.

(b) The net length, in feet [meters], of solid pavement marking authorized and acceptably applied.

(c) The number of directional arrows or pavement messages authorized and acceptably applied.

(d) The number of WZRPM's authorized and acceptably applied.



Duane F Brautigam
08/26/2003 03:45 PM

To: CO-SPECALL
cc:
Subject: Portable Temporary Low Profile Barrier

Duane F. Brautigam, P.E.
State Specifications Engineer
Florida Department of Transportation
(850) 414-4130; SC 994-4130
duane.brautigam@dot.state.fl.us

----- Forwarded by Duane F Brautigam/CO/FDOT on 08/26/2003 03:45 PM -----



Brian A Blanchard
08/26/2003 03:42 PM

To: FDOT-DDE DPME
cc: Robert Greer/CO/FDOT@FDOT, Ananth Prasad/CO/FDOT@FDOT,
William N Nickas/CO/FDOT@FDOT, Bruce
Dietrich/CO/FDOT@FDOT, Duane F Brautigam/CO/FDOT@FDOT,
Sharon E Holmes/CO/FDOT@FDOT, Elwin
Broome/CO/FDOT@FDOT, marvin.williams@fhwa.dot.gov, Jim
Mills/CO/FDOT@FDOT

Subject: Portable Temporary Low Profile Barrier

We have recently posted Interim Index 412, Portable Temporary Low Profile Barrier for Roadside Safety, Sheets 1-5 of 5 on the Roadway Design Office web site under Interim Standards for 2002. It will soon also be added to the Interim Standards for the 2004 Design Standards.

This barrier is applicable for design speeds of 45 mph or less where a low profile is desired to maintain sight distance at intersections and driveways. This Interim may be used beginning immediately. Please note that availability of this device will be limited initially, since the precast industry will need time for mobilizing and tooling up to begin fabrication. This should be considered in establishing project schedules when calling for this device.

The Roadway Design Office web site for Interim Standards is:

<http://www.dot.state.fl.us/rddesign/rd/Interims.htm>

Please advise appropriate staff and consultants.

Brian A. Blanchard, P.E.
Florida Department of Transportation
State Roadway Design Engineer
(850) 414-4377
email: brian.blanchard@dot.state.fl.us

The following are concerns industry has with the proposed “K-Rail” design:

1. Section 521, Paragraph 2, *Obtain precast concrete barrier walls from a manufacturing plant currently certified by the Department to produce precast concrete barrier walls. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from manufacturer.*

There is no certification currently required by the Department to manufacture barrier wall. The QC stamp seems excessive for a temporary item, especially with the quantities involved.

2. 521-4 Curing. *Cure cast in place and precast walls for 12 hours by leaving the form in place.*
It is common for precast manufacturers to “double cycle” forms in a day. This normally can be accomplished in 4-6 hours under controlled practices.
3. Index No. 715 Drawing 1 of 5. *Fabricator Prequalification: The Barrier Units shall be made in a prestressed concrete plant that meets the requirements of Specification Section 450.* This is not a prestressed item, why does it need to be manufactured by a prestresser?
4. Lifting Sleeve Assembly: These are not used currently in barrier manufactured in Florida, is this optional or required?
Marking: This seems excessive for a temporary item, especially with the quantities involved.
5. Alternate design: Requires crash testing, but this design has not been crash tested as of yet.
6. Drawing 3 of 5: Limitations of use: *The Barrier Units must be Installed on a flexible pavement (asphalt) or rigid pavement (concrete) surface as shown with a cross section slope of 1:10 of flatter.* Many applications of temporary barrier have the barrier installed on the grass or dirt shoulder of the roadway.
7. Drawing 4 of 5: Limitation of Use: This anchor system cannot be used on post-tensioned or prestressed bridge decks. What can be used?
8. Drawing 4 of 5: Use of Adhesive-Bonded Anchor Bolts, removal will cause damage to bridge decks. Can alternate Anchors be used.



Ghulam Mujtaba

09/02/2003 04:40 PM

To: Duane F Brautigam/CO/FDOT@FDOT
cc: John H Owens/CO/FDOT@FDOT
Subject: Type K-Barrier Walls

Duane:

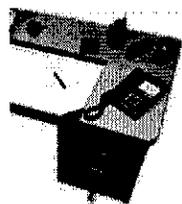
This morning we discussed the requirements of the Type K-Barrier Walls with Structures Design Office. Robert might have discussed it with you or with John.

There is a project in District 1 & 7 that requires Type K-Barrier walls. I sent the attached information to John Barker, District Materials Engineer, for his information. They may prepare change order or supplemental agreement.

Structures Design Office is preparing the revised Standard Index and we will modify the specification based on the revised standard index and industry review comments. After review by the Design Office, will resubmit the modified specification for your review and consideration.

Ghulam Mujtaba, P.E., C.P.M.
State Prestressed Concrete Engineer
Florida Department of Transportation
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----- Forwarded by Ghulam Mujtaba/SM/FDOT on 09/02/2003 04:23 PM -----



Ghulam Mujtaba

09/02/2003 04:23 PM

To: John Barker/D1/FDOT@FDOT
cc: Robert Robertson/CO/FDOT@FDOT, Charles E
Boyd/CO/FDOT@FDOT, Ananth Prasad/CO/FDOT@FDOT, David
Sadler/CO/FDOT@FDOT, Guy Padgett/SM/FDOT@FDOT, Richard
J Kessler/SM/FDOT@FDOT, Paul Mize/SM/FDOT@FDOT, Joe C
Tolleson/SM/FDOT@FDOT, Tom O Malerk/SM/FDOT@FDOT
Subject: Type K-Barrier Walls

John:

The following were the results of our discussions with the State Structures Design Office related to Type K Barrier Walls:

- 1- Type K barrier walls can be cast at any Department approved precast concrete plants (Prestressed or non-prestressed concrete plants).
- 2- Class IV 5500 psi concrete will be used in casting of the products.

3- The products will be accepted based on the QC testing, in accordance with the modified 346 specification, and manufacturer's certification. The modified 346 specification will delete the acceptance of the low strength concrete based on pay adjustment. The products will not be accepted when the compressive strength of concrete test results, representing the failed LOT is less than 5500 psi.

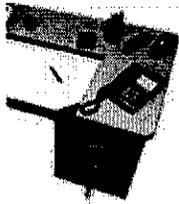
4- Department will perform monthly inspections of the manufacturing plant.

The State Structures Design Office is modifying Standard Index and this Office will propose the modified specifications related to the aforementioned changes.

For the existing projects supplemental agreement or change order may be needed reflect the above requirements or any other modifications based on the revised plans and modified specifications.

Please advise if there are any questions.

Ghulam Mujtaba, P.E., C.P.M.
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 SC 625-6685
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E-Mail: ghulam.mujtaba@dot.state.fl.us



Ghulam Mujtaba
09/03/2003 08:27 AM

To: Robert Robertson/CO/FDOT@FDOT
cc: Ananth Prasad/CO/FDOT@FDOT, Charles E
Boyd/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT, Guy
Padgett/SM/FDOT@FDOT, Joe C Tolleson/SM/FDOT@FDOT,
John Barker/D1/FDOT@FDOT, Paul Mize/SM/FDOT@FDOT,
Richard J Kessler/SM/FDOT@FDOT, Tom O
Malerk/SM/FDOT@FDOT, Fazel H Faqeer/SM/FDOT@FDOT,
Michael Bergin/SM/FDOT@FDOT, Duane F
Brautigam/CO/FDOT@FDOT, John H Owens/CO/FDOT@FDOT
Subject: Re: Type K-Barrier Walls

Robert:

Thanks for the clarification of my e-mail. It should be noted that Section 346-10 allows acceptance of low strength concrete up to 500 psi or 10% of the specified strength, whichever is greater. In this case 10 % of the specified strength (550 psi) will govern.

The 346 specification accepts low strength concrete with pay adjustment. This will work for the first project with pay adjustment. The pay reduction may not be applicable, when the barrier walls will be used on the other projects, unless identification marks of the barrier wall designate it as deficient product. It might work better if low strength products (below 5500 psi) will be rejected.

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Robert Robertson



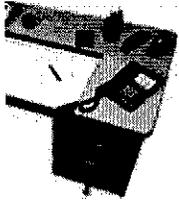
Robert Robertson
09/03/2003 07:30 AM

To: Ghulam Mujtaba/SM/FDOT@FDOT
cc: Ananth Prasad/CO/FDOT@FDOT, Charles E
Boyd/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT, Guy
Padgett/SM/FDOT@FDOT, Joe C Tolleson/SM/FDOT@FDOT,
John Barker/D1/FDOT@FDOT, Paul Mize/SM/FDOT@FDOT,
Richard J Kessler/SM/FDOT@FDOT, Tom O
Malerk/SM/FDOT@FDOT
Subject: Re: Type K-Barrier Walls

One comment to your #3. We will accept 346 rules partially for under-strength concrete.

Barriers represented by concrete strengths up to 500 psi low (greater than 5000 psi) will be accepted as the spec allows but no structural analysis will be accepted for concrete strengths that fall outside the 500 psi deficit. If the concrete strengths are below 5000 psi, the barriers will be rejected.

Robert Robertson
FDOT Tallahassee Structures
SC 994-4267
(850) 414-4267
Ghulam Mujtaba



Ghulam Mujtaba
09/02/2003 04:23 PM

To: John Barker/D1/FDOT@FDOT
cc: Robert Robertson/CO/FDOT@FDOT, Charles E
Boyd/CO/FDOT@FDOT, Ananth Prasad/CO/FDOT@FDOT, David
Sadler/CO/FDOT@FDOT, Guy Padgett/SM/FDOT@FDOT, Richard
J Kessler/SM/FDOT@FDOT, Paul Mize/SM/FDOT@FDOT, Joe C
Tolleson/SM/FDOT@FDOT, Tom O Malerk/SM/FDOT@FDOT
Subject: Type K-Barrier Walls

John:

The following were the results of our discussions with the State Structures Design Office related to Type K Barrier Walls:

- 1- Type K barrier walls can be cast at any Department approved precast concrete plants (Prestressed or non-prestressed concrete plants).
- 2- Class IV 5500 psi concrete will be used in casting of the products.
- 3- The products will be accepted based on the QC testing, in accordance with the modified 346 specification, and manufacturer's certification. The modified 346 specification will delete the acceptance of the low strength concrete based on pay adjustment. The products will not be accepted when the compressive strength of concrete test results, representing the failed LOT is less than 5500 psi.
- 4- Department will perform monthly inspections of the manufacturing plant.

The State Structures Design Office is modifying Standard Index and this Office will propose the modified specifications related to the aforementioned changes.

For the existing projects supplemental agreement or change order may be needed reflect the above requirements or any other modifications based on the revised plans and modified specifications.

Please advise if there are any questions.

Ghulam Mujtaba, P.E., C.P.M.
State Prestressed Concrete Engineer
Florida Department of Transportation
5007 N.E. 39th Avenue
Gainesville, Florida 32609
Phone: (352) 955-6685
 SC 625-6685
Fax: (352) 955-6689
E-Mail: ghulam.mujtaba@dot.state.fl.us

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND
PARAPETS.
(REV 6-26-037-7-037-21-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ precast or cast in place concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete,~~ in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use permanent precast concrete barrier walls on bridge or box culvert structures. ~~Ensure that all Temporary barrier walls must also meet the requirements of Section 102 Index No. 415. Use of precast walls cast prior to October 1, 2002 requires certification from the producer that the walls were cast prior to October 1, 2002 and are in compliance with Design Standard Index.~~

Obtain precast concrete barrier walls from a manufacturing plant ~~that is included on the Department's list of the qualified currently certified~~ by the Department to produce precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

to the Index it was produced to.
The product
L.C. → Old → Cert only
New → Must have QC stamp, date, lot, etc on each product.
be on cert. list and



Robert Robertson

08/11/2003 09:48 AM

To: Jim Mills/CO/FDOT@FDOT

cc: Charles E Boyd/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT, Ghulam Mujtaba/SM/FDOT@FDOT, John Grant/CO/FDOT@FDOT, John H Owens/CO/FDOT@FDOT, Paul Harkins/CO/FDOT@FDOT, Thomas A Andres/CO/FDOT@FDOT

Subject: Re: Section 521 - Concrete Barriers - addressing temporary barrier walls 

We need to make sure that this certification language does not apply to Index 715 barrier. As written in the attached, I am not sure this is clear. All 715 barrier will contain an identification plate that by making the plate is an act of certification. No written certification is required.

If we are no longer making Index 415 barrier and have been accepting 415 barrier in the past without certification, then why do we need certification now? Accept the existing 415 inventory "as is" and mandate the new barrier in truly critical locations. How can the contractor certify a product that was previously manufactured and was purchased from somebody else? The manufacturer can not even certify products that were previously manufactured.

Robert Robertson
FDOT Tallahassee Structures
SC 994-4267
(850) 414-4267
Jim Mills

Jim Mills

08/11/2003 09:08 AM

To: John H Owens/CO/FDOT@FDOT

cc: Paul Harkins/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT, Robert Robertson/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT, John Grant/CO/FDOT@FDOT, Thomas A Andres/CO/FDOT@FDOT, Ghulam Mujtaba/SM/FDOT@FDOT

Subject: Section 521 - Concrete Barriers - addressing temporary barrier walls

At the meeting July 30 on this issue, I agreed to develop some possible edits to Index 415 that would require certification from the producer on units cast prior to Oct 1, 2002. This was preferred by John Owens because of concerns about putting a date in the Spec.

Edits to Index 415 could be done to address this, but after more thought, I believe there is a way to address this in the specs. Below are my recommended edits. Note that Section 102 refers to Index 415 and Structures Index 715. Also note that in Index 415 we refer to the "FDOT 415 Temporary Barrier Wall". The last sentence has a date, but this date will not change until October 2012.

John, please let me know if this will work. Others, please comment if you have any suggestions or concerns.

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~~Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified currently certified by the Department to produce precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.~~

Obtain precast concrete barrier walls from a precast concrete plant meeting the requirements of Section 6-8. Ensure that each precast unit has either a visible permanent quality control stamp identifying the manufacturer, date of casting, and lot number, or written certification from the manufacturer that the units were manufactured in accordance with these specifications. The FDOT 415 Temporary Barrier wall unit requires written certification from the manufacturer that the units were cast prior to October 1, 2002 in compliance with Department Standards and Specifications at the time of fabrication.

Jim Mills, PE
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Roadway Design Office - Criteria and Standards
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FAX: (850) 414-5261 SC 994-5261
jim.mills@dot.state.fl.us

Jim Mills

08/11/2003 09:08 AM

To: John H Owens/CO/FDOT@FDOT

cc: Paul Harkins/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
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Sadler/CO/FDOT@FDOT, John Grant/CO/FDOT@FDOT, Thomas
A Andres/CO/FDOT@FDOT, Ghulam Mujtaba/SM/FDOT@FDOT

Subject: Section 521 - Concrete Barriers - addressing temporary barrier
walls

At the meeting July 30 on this issue, I agreed to develop some possible edits to Index 415 that would require certification from the producer on units cast prior to Oct 1, 2002. This was preferred by John Owens because of concerns about putting a date in the Spec.

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FAX: (850) 414-5261 SC 994-5261
jim.mills@dot.state.fl.us

Jim Mills

08/11/2003 10:20 AM

To: Robert Robertson/CO/FDOT@FDOT

cc: Charles E Boyd/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT,
Ghulam Mujtaba/SM/FDOT@FDOT, John Grant/CO/FDOT@FDOT,
John H Owens/CO/FDOT@FDOT, Paul Harkins/CO/FDOT@FDOT,
Thomas A Andres/CO/FDOT@FDOT

Subject: Re: Section 521 - Concrete Barriers - addressing temporary barrier
walls 

1. It was my thinking that if the 715 barrier was required to have the permanent markings according to the 715 Index, then obviously written certification would not be required. There is probably another way to word this part, but it seems to me this is covered.
2. I tend to agree with your points about accepting the 415 barrier, but David Sadler says Construction wants a producer's certification. I am just trying to help with the wording. I suppose this will all come up during Industry review. Don't forget there is some JJ hook system barrier out there that probably are not marked. The written certification would be not only for the old 415 barrier, but the JJ hook as well.

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jim.mills@dot.state.fl.us

Robert Robertson



Robert Robertson

08/11/2003 09:48 AM

To: Jim Mills/CO/FDOT@FDOT

cc: Charles E Boyd/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT,
Ghulam Mujtaba/SM/FDOT@FDOT, John Grant/CO/FDOT@FDOT,
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Thomas A Andres/CO/FDOT@FDOT

Subject: Re: Section 521 - Concrete Barriers - addressing temporary barrier
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contractor certify a product that was previously manufactured and was purchased from somebody else? The manufacturer can not even certify products that were previously manufactured.

Robert Robertson
FDOT Tallahassee Structures
SC 994-4267
(850) 414-4267
Jim Mills

Jim Mills

08/11/2003 09:08 AM

To: John H Owens/CO/FDOT@FDOT
cc: Paul Harkins/CO/FDOT@FDOT, Charles E Boyd/CO/FDOT@FDOT,
Robert Robertson/CO/FDOT@FDOT, David
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A Andres/CO/FDOT@FDOT, Ghulam Mujtaba/SM/FDOT@FDOT
Subject: Section 521 - Concrete Barriers - addressing temporary barrier
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Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified currently certified by the Department to produce precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

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were cast prior to October 1, 2002 in compliance with Department Standards and Specifications at the time of fabrication.

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jim.mills@dot.state.fl.us

Hector Wilson

07/15/2003 05:15 PM

To:

cc: (bcc: Duane F Brautigam/CO/FDOT)

Subject: Interim Indexes 0307, 0400, 413, 0415, 0501, 0505

Brian A Blanchard

07/10/2003 04:40 PM

To: FDOT-DDE DPME

cc:

Subject: Interim Indexes 0307, 0400, 413, 0415, 0501, 0505

We have recently posted several new Interim Indexes to the 2002 Design Standards on the Roadway Design Office web site.

Interim Index 0307 Miscellaneous Utility Details dated 07-01-03, Sheets 1-3 of 3 replaces Index 307 Sheet 1 of 1. Sheet 1 was revised to address longitudinal cuts and clarify flowable fill requirements. Sheet 2 was added to provide conflict structure details that are being removed from Index 201. The conflict structure details in Index 201 are being deleted by Special Provision in the January 2004 workbook. Sheet 3 provides new details for patching for ring and cover adjustments. This Interim should be included in all plans involving utility cuts beginning with the January 2004 letting.

Interim Index 0400 Guardrail dated 5-29-03, Sheet 1 of 1 is a supplement to Index 400. This Interim provides details for the End Anchorage Assembly type REGENT-C. The REGENT-C is an approved flared end anchorage system that can be used when specifically called for in the plans, or at the contractor's option whenever the plans call for the flared end anchorage where the options allowed do not specifically exclude the REGENT-C. This Interim should be included in all plans calling for the flared end anchorage to the extent practical without adverse impact to production schedules and budgets beginning immediately.

Interim Index 0400 Guardrail dated 06-30-03, Sheet 19 of 32. This Interim replaces Index 400 Sheet 19 of 32. Sheet 19 was revised to include details for steel back-up plates for special end shoes and terminal connectors to concrete bridge traffic railing barriers. This Interim shall be included in all plans calling for guardrail connecting to concrete bridge traffic railing barrier (Index 400 Detail J) beginning with the January 2004 letting, and on all projects prior to the January 2004 letting to the extent practical without adverse impact to production schedules and budgets.

Interim Index 413 Proprietary Temporary Concrete Barrier dated 7-1-03, Sheet 1 of 1. This is a new Index drawing duplicating and replacing Interim Index 0415 dated 11-04-02. This revision coincides with the issuance of a Interim Index 0415 Temporary Concrete Barrier Wall, dated 07-01-03, Sheet 1-10 of 10 (see below). Interim Index 413 should be included in all plans using Interim Index 0415 Temporary Concrete Barrier Wall, dated 07-01-03.

Interim Index 0415 Temporary Concrete Barrier dated 7-1-03, Sheets 1-10 of 10. This Interim Index completely replaces Index 415 Precast Concrete Temporary Barrier Wall. Revisions include revised General Notes to clarify allowed barrier options for roadway use, deletion of fabrication details for the 415 barrier wall that can no longer be manufactured, new details to clarify the determination of length of need and when anchor plates are required on end units, and new details for continuation of barrier runs with dissimilar connectors. The new details include transitions between the Type K barrier required on bridges and other type barriers used on the roadway. This Interim Index shall be included in all plans calling for temporary barrier wall beginning with the January 2004 letting, and on all projects prior to the January 2004 letting where the plans call for Type K Barrier Wall.

Interim Index 0501 Geosynthetic Reinforced Soils dated 7-1-03, Sheets 1-8 of 8. This Interim Index replaces Index 501 and includes revised general notes, revised application usages, additional geogrids and updated design properties. This Interim Index should be included in all plans calling for geosynthetic reinforced soils to the extent practical without adverse impact to



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: August 19, 2003

TO: Ghulam Mujtaba, State Materials Office

FROM: Clinton J. Shaw, State Specifications Office 

SUBJECT: **Proposed Modifications To Specification: D5210000 – Concrete Barriers, Traffic Railing Barriers and Parapets.**

Comments received, regarding the subject modification to the Standard Specifications, are attached.

These comments are posted on the State Specifications Office Web Page and included in the Specifications folder for future reference, should someone question your response. Your assistance will be appreciated.

As requested by Robert Robertson in the attached e-mail, this proposed revision will be placed on hold until further notice.

Please Email submittals to SP965CS or clinton.shaw@dot.state.fl.us.

CS/jho

Attachment

SUGGESTION FROM DAVID SADLER, STATE CONSTRUCTION OFFICE

CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.

521-1 Description.

Construct ~~plain or reinforced~~ *precast or cast in place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete~~, in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent precast concrete* barrier walls on bridge or box culvert structures. *Ensure that all Temporary barrier walls must also meet the requirements of Section 102 Index No. 415. Use of precast walls cast prior to October 1, 2002 requires certification from the producer that the walls were cast prior to October 1, 2002 and are in compliance with Design Standard Index.*

Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified currently certified by the Department to produce precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

D5210000 - Concrete Barriers, Traffic Railing Barriers and Parapets

Username: Randy Cropp
UserEmail: randycropp@themurphyco.com
UserTel: 561-655-3634 ext 110
UserFAX: 561-655-3674

Comments:

THIS SPECIFICATION IS IN LEFT FIELD. A MAJOR REWORK NEEDS TO BE COMPLETED. Plant Certification (Why)? Curing (what happens if I slip form? How do I leave forms in place?) How is this already out for use without any industry review? Placing barrier wall on pavement only (if this is to take place the cost of barrier wall will be increased. Many of jobs we run out into the grass area to avoid an attenuator, this will also leave a blunt end so it will be a head on instead of a potential glancing blow)? Anchorage attachment to bridges methods and reasoning? Many more questions I think we need the creator of the specification to come to the next specifications-structures meeting

Concrete Barriers, Traffic Railing Barriers and Parapets

Username: J.C. Miseroy
UserEmail: jc.miseroy@gcinc.com
UserTel: 813-623-5877
UserFAX: 813-621-2543

Comments:

The new specification refers to Standard 415, which relates to temporary barrier wall. I assume that this reference would only apply when temporary barrier is left in place on a project as permanent barrier. If it applies to the manufacture of temporary barrier for MOT use, how do we allow for existing temporary barrier that is already fabricated prior

to October 2002 which does not have a QC stamp on it? How does a plant become certified to manufacture precast barrier?

Concrete Barriers, Traffic Railing Barriers and Parapets

Username: Jim Mills
UserEmail: jim.mills@dot.state.fl.us
UserTel: 850-414-4318
UserFAX: 850-414-5261

Comments:

521-1 should reference 102 instead of Index 415. Section 102 includes appropriate references to Index 415 and QPL requirements for temporary barrier, reference to the new Structures Index 715, and payment for temporary barrier wall.

The proposed changes to 521 do not address how temporary barrier wall produced prior to this specification change will be accepted on jobs. There is a large inventory of temporary barrier wall that will not have the required identification mark, but these walls will still be acceptable for use on roadways. Recommend including a phrase that states precast barrier manufactured after January 1, 2004 (or July 1, 2004) is required to have the visible stamp, or include some other provision to address this.

File: D5210000 - Concrete Barriers, Traffic Railing Barriers and Parapets
Username: Randy Cropp
UserEmail: randycropp@themurphyco.com
UserTel: 561-655-3634 ext 110
UserFAX: 561-655-3674

Comments:

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Robert Robertson
08/19/2003
08:16 AM

To: Ghulam Mujtaba/SM/FDOT@FDOT
cc: Ananth Prasad/CO/FDOT@FDOT, Brian A Blanchard/CO/FDOT@FDOT,
Charles E Boyd/CO/FDOT@FDOT, David Sadler/CO/FDOT@FDOT,
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Kessler/SM/FDOT@FDOT, Steve I Plotkin/CO/FDOT@FDOT, Tom
O Malerk/SM/FDOT@FDOT, William N Nickas/CO/FDOT@FDOT,
Duane F Brautigam/CO/FDOT@FDOT
Subject: Re: K-Rail

This issue has been going around for a while and I am not sure we are all moving in the same direction. The Type K barrier, Index 715, is critical to the life and safety of the public using our facilities. During development of the standard, the SDO decided that to assure the total compliance with the standard that the Dept must inspect this product and also must use concrete meeting the requirements of 346 to assure performance. Since drainage products are not inspected by DOT and do not utilize 346 concrete, the SDO decided the fabrication be in accordance with 450 and 346. The states prestress plants are the only location known to us that can meet the material and inspection requirements. These plants are fully inspected and utilize 346 concrete. We do not feel that this product should be fabricated in plants without DOT inspection or 346 concrete.

Duane, the proposed 521 spec should be placed on hold until these differences in direction are resolved.

Robert Robertson
FDOT Tallahassee Structures
SC 994-4267
(850) 414-4267



POSTED 7/21/03
J.A.B.

Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: July 21, 2003

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer

SUBJECT: Proposed Specifications Change – D5210000 – Concrete Barriers, Traffic Railing Barriers and Parapets.

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Concrete Barriers, Traffic Railing Barriers and Parapets.

This change was proposed by Ghulam Mujtaba, State Materials Office to address the qualification of the plants that are manufacturing precast concrete barrier walls for department projects.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after August 18, 2003 may not be considered. Your input is encouraged.

DFB/jho

Attachment

COMMENTS:

Submitted by:

Phone #:

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND
PARAPETS.
(REV ~~6-26-03~~ 7-037-21-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

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521-2 Materials.

Meet the following requirements:

Portland Cement Concrete.....	Section 346
Reinforcing Steel.....	Section 415
Joint Materials	Section 932

521-3 Construction.

521-3.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-3.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-3.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation

elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-3.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 m], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-4 Curing.

Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. *During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400-16.* After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.

Cure slip formed barrier walls in accordance with 400-16.

521-5 Joints.

521-5.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-5.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-5.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-6 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

Item No. 521- 1-	Concrete Barrier Wall - per foot.
Item No. 2521- 1-	Concrete Barrier Wall - per meter.
Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

THOMAS F. BARRY, JR.
SECRETARY

Mail Station 32

MEMORANDUM

DATE: September 27, 2002

TO: ✓ Ananth Prasad, State Construction Engineer
Sharon Holmes, State Maintenance Engineer

FROM: Brian Blanchard, State Roadway Design Engineer *B.B.*

COPIES: Bob Greer, William Nickas, Jim Mills, John Grant, Cheryl Adams,
District Design Engineers, District Consultant Project Management Engineers
Chris Richter (FHWA)

SUBJECT: Index 415 Precast Concrete Temporary Barrier Wall
Phase Out Requirements

This memo is to clarify recent questions regarding the phasing out of the FDOT Temporary Concrete Barrier Wall as detailed in Index 415 of the 2002 Design Standards and prior editions. The 2002 Design Standards Index 415 includes the following note:

"The temporary concrete barrier wall unit shown in this Index that is produced prior to October 1, 2002, and that is in good condition, can be used on State Highway projects through September 30, 2012. Temporary concrete barrier units produced on or after October 1, 2002 must meet NCHRP 350 criteria, and must be included on the Qualified Products List. If and when a generic temporary concrete barrier wall unit is approved for use on State Highway projects, the unit design will be posted on the Roadway Design Office web site."

This note is self explanatory for all jobs let with the 2002 Design Standards which was effective beginning July 2002 on all English projects. A similar note is included in the Special Provisions for the 2000 Roadway and Traffic Design Standards metric edition effective beginning with the July 2002 letting on metric projects.

Questions have arisen regarding the applicability of the October 1, 2002 production restrictions on projects let prior to July 2002. Since this note was not included in prior editions of the Design Standards, or Special Provisions, it is NOT applicable to projects let to contract prior to July 2002. This means contractors may continue to produce temporary barrier wall units detailed in

September 18, 2002
Memo to Mr. Prasad and Ms. Holmes
Page 2

Index 415 after October 1, 2002 for use on projects let prior to July 2002. The FHWA has stated this is in keeping with our agreement for phasing out this barrier. However, any such units produced for these projects cannot in turn be used at any time on projects let to contract beginning with the July 2002 letting.

Note there is currently no practical means to mark units in a reliable way to identify which units are produced prior to October 1, 2002 versus those that are produced after this date. However, based on our discussions with FTBA and Industry representatives, we anticipate a high degree of compliance with the cutoff date. Industry has agreed that in cases where CEI personnel suspect a violation, a certification statement from the Contractor that the units furnished were produced prior to October 1, 2002 should be requested.

Please contact me at 850-414-4377, Suncom 994-4377, if you have any questions.



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: July 21, 2003

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer

SUBJECT: Proposed Specifications Change – D521000 – Concrete Barriers, Traffic Railing Barriers and Parapets.



In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change to Concrete Barriers, Traffic Railing Barriers and Parapets.

This change was proposed by Ghulam Mujtaba, State Materials Office to address the qualification of the plants that are manufacturing precast concrete barrier walls for department projects.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after August 18, 2003 may not be considered. Your input is encouraged.

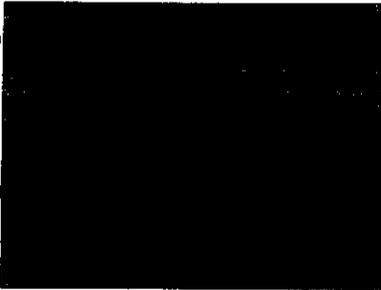
DFB/jho

Attachment

COMMENTS:

Submitted by: _____ Phone #: _____

CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.
(REV-6-26-037-7-03)



SECTION 321 (Pages 589-590) is substituted:

SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS

521-1 Description.

Construct ~~plain or reinforced~~ *precast or cast in place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete,~~ in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent precast concrete* barrier walls on bridge or box culvert structures. *Temporary barrier walls must also meet the requirements of Section 102.*

Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

521-2 Materials.

Meet the following requirements:

- Portland Cement Concrete.....Section 346
- Reinforcing Steel.....Section 415
- Joint MaterialsSection 932

521-3 Construction.

521-3.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-3.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-3.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation

elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-3.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge, overlapping the straightedge for the full length of the plane surfaces. Correct straightedging, greater than 3/8 inch [10 mm], measured as an ordinate by the straightedge, in an approved manner at no expense to the Department. Do not use coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct deviations.

521-4 Curing.

Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. *During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400.* After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.

Cure slip formed barrier walls in accordance with 400-16.

521-5 Joints.

521-5.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-5.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-5.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-6 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

- | | |
|-------------------|--|
| Item No. 521- 1- | Concrete Barrier Wall - per foot. |
| Item No. 2521- 1- | Concrete Barrier Wall - per meter. |
| Item No. 521- 5- | Concrete Traffic Railing Barrier (Bridge) – per foot. |
| Item No. 2521- 5- | Concrete Traffic Railing Barrier (Bridge) – per meter. |
| Item No. 521- 6- | Concrete Parapet (Bridge) – per foot. |
| Item No. 2521- 6- | Concrete Parapet (Bridge) – per meter. |
| Item No. 521-72- | Concrete Barrier Wall – per foot. |
| Item No. 2521-72- | Concrete Barrier Wall – per meter. |



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSE ABREU
SECRETARY

MEMORANDUM

DATE: July 10, 2003

TO: Bob Burleson, FTBA, David Sadler, State Construction Office, Brian Blanchard, State Roadway Design Office, William N. Nickas, State Structures Design Office, Bruce Dietrich, State Pavement Management Office, Greg Davis, State Estimates Office, Clay McGonagill, General Counsel's Office

FROM: Clinton J. Shaw, State Specifications Office 

SUBJECT: **Proposed Specification: D5210000 – Concrete Barriers, Traffic Railing Barriers and Parapets.**

Attached for your review and comments is a copy of the subject Special Provision for Concrete Barriers, Traffic Railing Barriers and Parapets.

This change was proposed by Ghulam Mutjtaba, State Materials Office to address the qualification of the plants that are manufacturing precast concrete barrier walls for department projects.

Please review and offer your comments.

CS/jho
Attachment

**353 CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND
PARAPETS.
(REV 6-26-03 7-7-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ *precast or cast in place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, with ~~precast or cast in place concrete~~, in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent precast concrete* barrier walls on bridge or box culvert structures. *Temporary barrier walls must also meet the requirements of Section 102.*

Obtain precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified precast concrete barrier wall plants. Ensure that each section of barrier wall has a visible quality control stamp, date of casting and lot number from the manufacturer.

521-2 Materials.

Meet the following requirements:

Portland Cement Concrete.....	Section 346
Reinforcing Steel.....	Section 415
Joint Materials	Section 932

521-3 Construction.

521-3.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-3.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-3.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation

elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-3.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-4 Curing.

Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. *During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400.* After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.

Cure slip formed barrier walls in accordance with 400-16.

521-5 Joints.

521-5.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-5.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures: The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-5.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures: Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-6 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

Item No. 521- 1-	Concrete Barrier Wall - per foot.
Item No. 2521- 1-	Concrete Barrier Wall - per meter.
Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: June 26, 2003

TO: Ghulam Mutjtaba, State Materials Office

FROM: Clinton J. Shaw, State Specifications Office

SUBJECT: **Proposed Specification: D5210000 - Concrete Barriers, Traffic Railing Barriers and Parapets.**

Your proposed specification has been formatted and entered for processing. As the originator for this specification, please review the formatted draft and make any necessary changes.

Additionally, please verify the condition under which this specification is to be used (see usage note under specification number).

If you have any questions, please contact Clinton Shaw at (850) 414-4110 or Suncom 994-4110. Your response within two weeks will be appreciated, as further processing is dependent upon your response. We will continue to update you as we process this request for implementation.

CS/jho
Attachment

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND
PARAPETS.
(REV 6-26-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ *precast or cast in place* concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, ~~with precast or cast in place concrete,~~ in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent precast concrete* barrier walls on bridge or box culvert structures. *Temporary barrier walls must also meet the requirements of Section 102.*

Obtain the precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified precast concrete barrier wall plants. The plants are required to have a Department- approved quality control plan. The plants must prepare and submit their quality control plans for Department review in accordance with Section 6 and 105. The Department will performs the initial and at least annual qualification reviews of the precast concrete plants to assure of their compliance with the requirements of Contract Documents Department approved quality control plans. that they meet the requirement of their quality control plans and Contract Documents.

521-2 Materials.

Meet the following requirements:

Portland Cement Concrete.....	Section 346
Reinforcing Steel.....	Section 415
Joint Materials	Section 932

The Department will accept cast in place concrete barrier walls that meet the requirements of the Contract Documents, Contractor's approved quality control plan, and Department's verification inspection and testing.

The acceptance of the precast concrete barrier walls is based on the plant quality control manger's visible approved quality control stamp and identification marks on each section of the barrier wall. The identification mark must be traceable to the specific precast concrete plant, lot and manufacture date, standard index number, and issue date. Placing the quality control stamp on each section indicates a certification, which certifies the barrier wall has been manufactured, in accordance with the Contract Documents, under the direct observation of the plant's qualified quality control manager or quality control personnel under direct supervision of the quality control manager. The quality control inspection and testing are available at the plant. The configuration of the quality control manager's approval stamp is included as part of the plant's quality control plan. The plant's quality control manager must report is reporting directly to the general manager or to the management through the chief engineer.

521-3 Construction.

521-3.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated

concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-3.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-3.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-3.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-4 Curing.

Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. *During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400.* After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.

Cure slip formed barrier walls in accordance with 400-16.

521-5 Joints.

521-5.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

521-5.2 Contraction Joints in Barrier Walls Supported by or Adjoining Rigid Structures:

The Contractor may form or saw contraction joints. When sawing contraction joints, saw them as soon as the concrete has hardened sufficiently to permit sawing without raveling and before uncontrolled cracking occurs, but in no case later than 12 hours after casting. Match contraction joints to adjacent contraction joints in the structure. Space contraction joints at 15 to 30 foot [4.5 to 9.0 m] intervals. For barrier walls on bridge structures or approach slabs, space contraction joints as shown in the Contract Documents.

521-5.3 Expansion Joints in Barrier Walls Supported by or Adjoining Rigid Structures:

Construct expansion joints at right angles to the face, and extend them through the entire cross-section of the barrier wall. Construct barrier wall expansion joints at the same location and width as the expansion joints in the structure on which the wall rests and at other locations shown in the Contract Documents. When constructing reinforced barrier walls, form expansion joints with an expansion filler material or removable forming materials and secure to the forms as required to provide proper position. When using slip forming to construct non-reinforced barrier walls, construct expansion joints as in reinforced barrier walls or saw the joint through the plastic concrete the full depth and width of the barrier section. Where using the plastic sawing method, place close fitting shields over the concrete on each side of the joint for protection during sawing and hand finishing of the concrete at the joint.

521-6 Method of Measurement.

The quantity to be paid for under this Section will be the plan quantity, in feet [meters], completed and accepted. The quantity will be measured along the top of the barrier wall from the begin to end station, including transitional and end sections, with no deduction for expansion joints or open joints. Barrier walls on bridge structures and approach slabs to be removed shall be included in the cost of Removal of Existing Structures. Barrier walls to be removed along roadways are included in the cost of clearing and grubbing, or if a pay item is included, in the cost of Removal of Concrete Barrier Wall.

521-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

Item No. 521- 1-	Concrete Barrier Wall - per foot.
Item No. 2521- 1-	Concrete Barrier Wall - per meter.
Item No. 521- 5-	Concrete Traffic Railing Barrier (Bridge) – per foot.
Item No. 2521- 5-	Concrete Traffic Railing Barrier (Bridge) – per meter.
Item No. 521- 6-	Concrete Parapet (Bridge) – per foot.
Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.

ORIGINATION FORM

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR
(The person who receives or originates the issue and needs to forward the issue for action.)

Modify Specification _____ 521 _____
Section/File number

New Section _____
Section number

Subject: Concrete Barriers, Traffic Railing Barriers and Parapets

Origination date: June 11, 2003

Originator: Ghulam Mujtaba
Office/Phone: State Materials Office/(352) 337-3172 SC 642-3172
Email address/ ghulam.mujtaba@dot.st
Userid:

Problem statement: The current specification does not address the qualification of the plants that are manufacturing precast concrete barrier walls for department projects.

Information source: The need for the proposed specification changes was discussed during the teleconference, which was held on May 23, 2003. Jim Mills, Robert Robertson, Ananth Prasad, David Sadler, John Grant, and Ghulam Mujtaba were present during the teleconference.

Background data: The implementation of the modified specification will requires the Contractors to obtain precast concrete barrier walls from plants that are on the department's list of the qualified precast concrete barrier wall plants

Desired implementation date:

This is not to be
B: processed at this time.
Jim Mills is working
on a version to be
sent with the
mandatory for
DO0900LS

SPECIFICATION PROCESSING AND STATUS FORM

Begin date: June 26, 2003

File Number: D5210000

Projected completion date: September 25, 2003.

Implementation team member: John Owens

Schedule of activities: Internal, Industry and FHWA reviews.

Resource needs: See Robert Robertson he thinks part of this needs to be in Section 6.

Implementation schedule: Beginning with the July 2004 letting.

Proposed solution: Address the qualification of plants that are manufacturing precast concrete barrier walls for Department projects.

Recommended Usage Note: 521, 2521 items

Progress report: What is the current status of the issue? Detail problems encountered, that hinders the process.

**CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS AND PARAPETS.
(REV 6-26-03)**

SECTION 321 (Pages 589-591) is deleted and the following substituted:

**SECTION 521
CONCRETE BARRIERS, TRAFFIC RAILING BARRIERS
AND PARAPETS**

521-1 Description.

Construct ~~plain or reinforced~~ precast or cast in place concrete barriers, traffic railing barriers and parapets, herein referred to as barrier walls, with ~~precast or cast in place concrete~~, in accordance with the details shown in the plans. Use stationary removable forms or sliding forms to construct the barrier walls. Do not use *permanent* precast concrete barrier walls on bridge or box culvert structures. *Temporary barrier walls must also meet the requirements of Section 102.*

Obtain the precast concrete barrier walls from a manufacturing plant that is included on the Department's list of the qualified precast concrete barrier wall plants. The plants are required to have a Department- approved quality control plan. The plants must prepare and submit their quality control plans for Department review in accordance with Section 6 and 105. The Department will perform the initial and at least annual qualification reviews of the precast concrete plants to assure of their compliance with the requirements of Contract Documents Department approved quality control plans. that they meet the requirement of their quality control plans and Contract Documents.

521-2 Materials.

Meet the following requirements:

Portland Cement Concrete.....	Section 346
Reinforcing Steel.....	Section 415
Joint Materials.....	Section 932

The Department will accept cast in place concrete barrier walls that meet the requirements of the Contract Documents, Contractor's approved quality control plan, and Department's verification inspection and testing.

The acceptance of the precast concrete barrier walls is based on the plant quality control manger's visible approved quality control stamp and identification marks on each section of the barrier wall. The identification mark must be traceable to the specific precast concrete plant, lot and manufacture date, standard index number, and issue date. Placing the quality control stamp on each section indicates a certification, which certifies the barrier wall has been manufactured, in accordance with the Contract Documents, under the direct observation of the plant's qualified quality control manager or quality control personnel under direct supervision of the quality control manager. The quality control inspection and testing are available at the plant. The configuration of the quality control manager's approval stamp is included as part of the plant's quality control plan. The plant's quality control manager must report is reporting directly to the general manager or to the management through the chief engineer.

521-3 Construction.

521-3.1 General: The Contractor may use stationary removable forms or slip form construction methods provided a completed barrier wall with acceptable alignment and finish is obtained. Construct forms of metal or timber with a form liner. Do not use forms which are damaged or are not in alignment. At no expense to the Department, remove and replace sections of barrier wall having unconsolidated concrete, surface blemishes, deviations in alignment or profile which exceed tolerances, or other defects which cannot be repaired to the satisfaction of the Engineer.

521-3.2 Stationary Form Construction: Provide precast or cast in place concrete barrier walls constructed using stationary forms in accordance with Section 400 and providing a Class 3 finish. Align and erect the stationary form so that all plane surfaces of the finished wall will have no deviation greater than 3/8 inch [10 mm] measured as an ordinate between the concrete and a 10 foot [3.048 m] straightedge. Correct all alignment deviations greater than 3/8 inch [10 mm] in accordance with 521-3.1. Straightedge by half lapping the straightedge for the full length of all plane surfaces.

521-3.3 Slip Form Construction: When electing to use the slip form method in lieu of the stationary forming method, place the concrete with a slip form machine approved by the Engineer, designed to form and consolidate the concrete in one pass in such a manner that a minimum of hand finishing is necessary to provide a dense, suitably finished barrier wall in accordance with the Contract Documents. Rigidly hold the sliding forms together laterally so that the forms will not spread. Operate the slip form machine with a continuous forward movement to minimize stops and starts of the machine. Arrange the concrete consolidation elements of the machine to start and stop simultaneously with the starting movement and stopping movement of the slip form machine. Ensure that the consolidation elements consist of internal vibrators and form vibrators. Provide a slip form machine that is a self contained, self powered unit.

Provide a finished texture to the slip formed barrier walls by hand troweling, brushing, or both to eliminate pockmarks, blemishes and any other discontinuities in surface texture. Ensure that the final finish has a fine texture and is free of pinholes, pockmarks, and blemishes.

Remove and recast or repair sections of slip formed barrier walls having areas of unconsolidated concrete, having surface blemishes, and/or having pockmarks greater than 1/2 inch [13 mm] in diameter after hand troweling and brushing in accordance with 521-3.1. Repair areas of unsatisfactory surface finish by hand methods using mortar screened from the concrete used to construct the barrier wall. Use the mortar screened from the barrier wall concrete only to fill holes and surface blemishes below the slip formed surface of the concrete. Do not use mortar as a surface overlay coating on the barrier wall concrete.

During the finishing operation, while the concrete remains plastic, straightedge all plane surfaces of the slip formed barrier wall with a 10 foot [3.048 m] straightedge. Straightedge by half lapping the straightedge for the full length of the plane surfaces. Correct any deviation found during straightedging, greater than 3/8 inch [10 mm], measured as an ordinate between the concrete surface and the straightedge, in an approved manner at no expense to the Department. Do not use surface overlay coatings of mortar screened from the concrete, or surface overlay coatings of concrete to correct alignment deviations.

521-4 Curing.

Cure cast in place and precast barrier walls for 12 hours by leaving the form in place. *During the form curing period ensure that the exposed surfaces are cured in accordance with Section 400.* After removing the form, cure the barrier wall by one of the methods specified in 400-16, for the remainder of the 72 hour curing period.

Cure slip formed barrier walls in accordance with 400-16.

521-5 Joints.

521-5.1 General: Place expansion and contraction joints in concrete barrier wall either mounted on or adjoining rigid structures in a manner similar to the type and method of jointing used in the supporting or adjoining structure or as shown in the Contract Documents. Place expansion and contraction joints in concrete barrier walls supported by soil or flexible foundation materials in the manner detailed in the plans.

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521-6 Method of Measurement.

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521-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including all reinforcing steel, conduits, materials and incidentals necessary to complete the work.

Payment will be made under:

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Item No. 2521- 6-	Concrete Parapet (Bridge) – per meter.
Item No. 521-72-	Concrete Barrier Wall – per foot.
Item No. 2521-72-	Concrete Barrier Wall – per meter.