

Signing and Marking Standards

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2013 Design Standards

Summary of Major Changes



DESIGN STANDARDS

FOR DESIGN, CONSTRUCTION, MAINTENANCE AND UTILITY
OPERATIONS ON THE STATE HIGHWAY SYSTEM

2013

TOPIC NO. 625-010-003

Approved For Use On Federal Aid Projects

J. Chris Ritter
For Martin Knopp, Division Administrator

State of Florida, Department of Transportation
Roadway Design Office
Mail Station 32
605 Suwannee Street
Tallahassee, Florida 32399-0450

Effective January 1, 2013

Index 415 Sheets 2-7

Dot Pattern Note

ALIGNMENT AND LENGTH OF NEED

△ The approach departure line location is determined by the line intersect with the back of the hazard or the area to be shielded, however the intersect offset distance is not to be beyond the clear zone limit. The trailing departure line is determined by the line intersect with the front of the downstream end of the hazard or the area to be shielded.

The length of barrier wall need is the distance from the approach departure line intersect with the upstream toe of the temporary concrete barrier wall to the trailing departure line intersect with the downstream toe of the temporary concrete barrier wall.

Where temporary concrete barrier wall Temporary concrete barrier wall end units shall be located at or outside the clear zone or shielded by other structure, earth embedment or a crash cushion.

Proprietary redirective crash cushions designed for use with temporary concrete barriers have the beginning length of need and departure line intersect point indicated on the respective GPL drawing for each proprietary crash cushion. Where redirective crash cushions are located on the departure line by their length of need reference point, the wall upstream end unit must be aligned with the crash cushion, and the wall's end unit secured with bolts or stakes. See Sheets 3 through 6 for configurations requiring end unit anchorage.

* The wall offset from the near traffic lane, wall flare rate and wall flare length are to be in conformance with the alignment called for in the plans and the alignments called for by Department Design Standards specified in the plans; in absence of either plan requirement, the offset shall be as determined by the Engineer, and, unless other flare rates are approved by the Engineer the flare rates to be applied are 1:10 or flatter for speeds ≤ 45 mph and 1:15 or flatter for speeds ≥ 50 mph* see Index No. 642 for other flare rates on freeway facilities.

The surface cross slope approaching the barrier wall and continuing across the required deflection space shall not exceed a rate of 1 vertical: 10 horizontal.

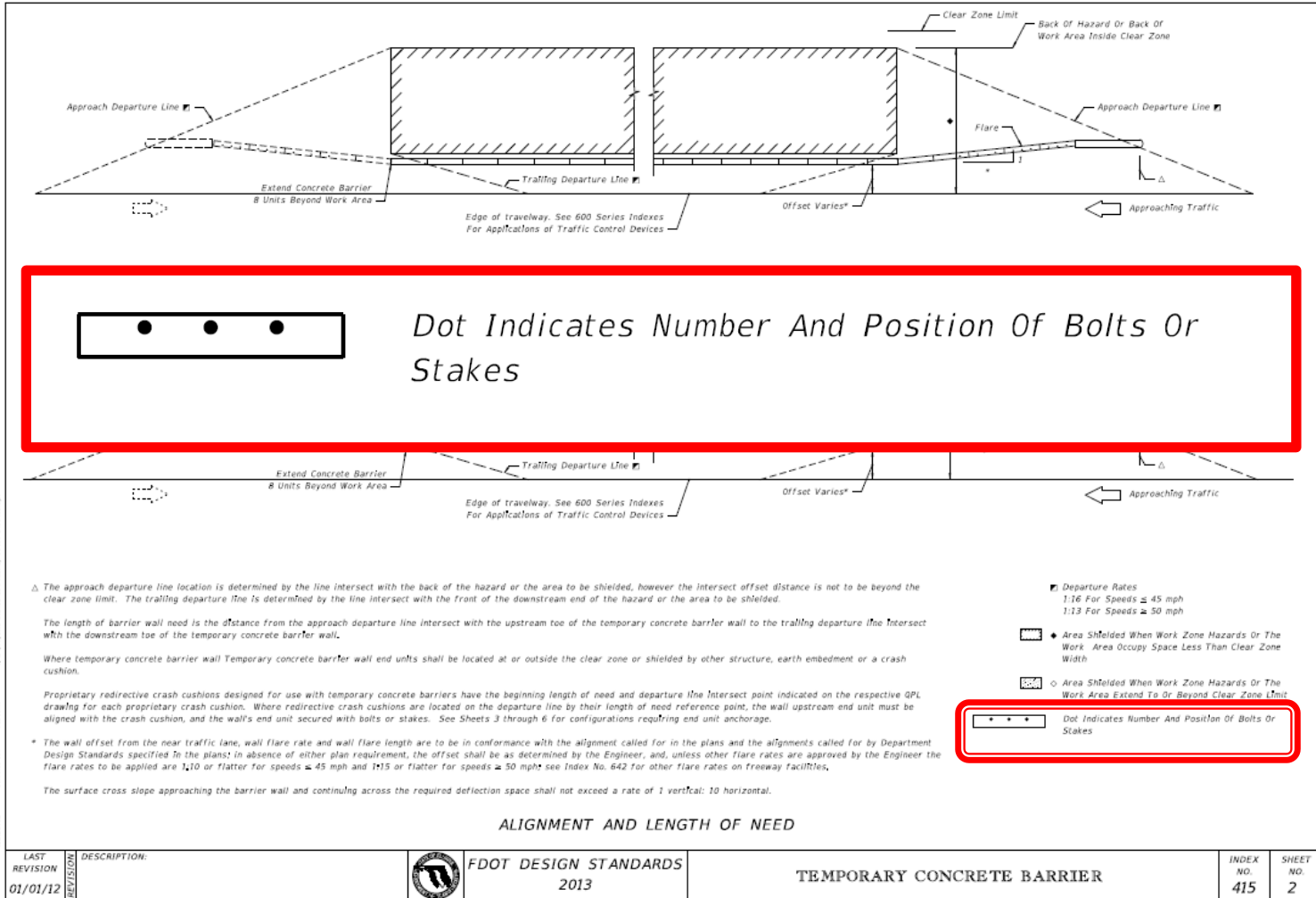
- Departure Rates
 - 1:16 For Speeds ≤ 45 mph
 - 1:13 For Speeds ≥ 50 mph
- Area Shielded When Work Zone Hazards Or The Work Area Occupy Space Less Than Clear Zone Width
- Area Shielded When Work Zone Hazards Or The Work Area Extend To Or Beyond Clear Zone Limit
- Dot Indicates Number And Position Of Bolts Or Stakes

LAST REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	TEMPORARY CONCRETE BARRIER	INDEX NO.	SHEET NO.
01/01/12				415	2

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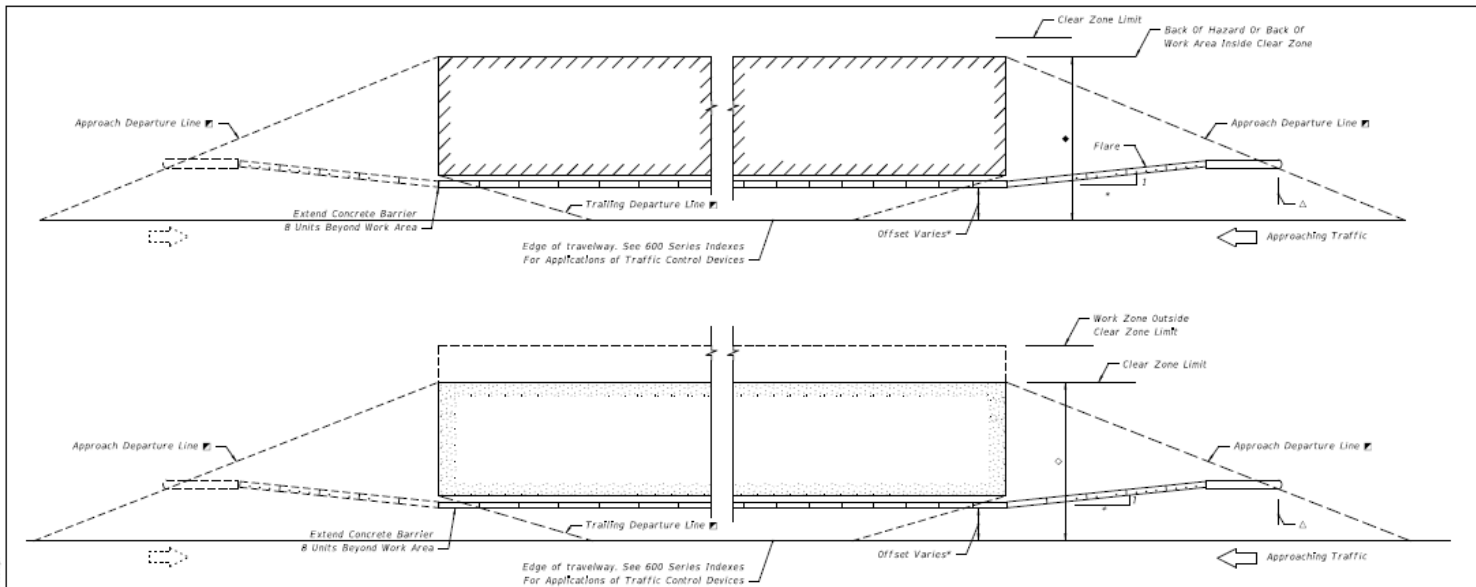
Dot Pattern Note



Effective January 1st, 2013

Index 415 Sheet 2

Alignment and Length of Need



△ The approach departure line location is determined by the line intersect with the back of the hazard or the area to be shielded, however the intersect offset distance is not to be beyond the clear zone limit. The trailing departure line is determined by the line intersect with the front of the downstream end of the hazard or the area to be shielded.

The length of barrier wall need is the distance from the approach departure line intersect with the upstream toe of the temporary concrete barrier wall to the trailing departure line intersect with the downstream toe of the temporary concrete barrier wall.

Where temporary concrete barrier wall Temporary concrete barrier wall end units shall be located at or outside the clear zone or shielded by other structure, earth embedment or a crash

Proprietary redirective crash cushions designed for use with temporary concrete barriers have the beginning length of need and departure line intersect point indicated on the respective QPL drawing for each proprietary crash cushion. Where redirective crash cushions are located on the departure line by their length of need reference point, the wall upstream end unit must be aligned with the crash cushion, and the wall's end unit secured with bolts or stakes. See Sheets 3 through 6 for configurations requiring end unit anchorage.

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The surface cross slope approaching the barrier wall and continuing across the required deflection space shall not exceed a rate of 1 vertical: 10 horizontal.

■ Departure Rates
1:16 For Speeds ≤ 45 mph
1:13 For Speeds ≥ 50 mph

▨ Area Shielded When Work Zone Hazards Or The Work Area Occupy Space Less Than Clear Zone Width

▨ Area Shielded When Work Zone Hazards Or The Work Area Extend To Or Beyond Clear Zone Limit

••••• Dot Indicates Number And Position Of Bolts Or Stakes

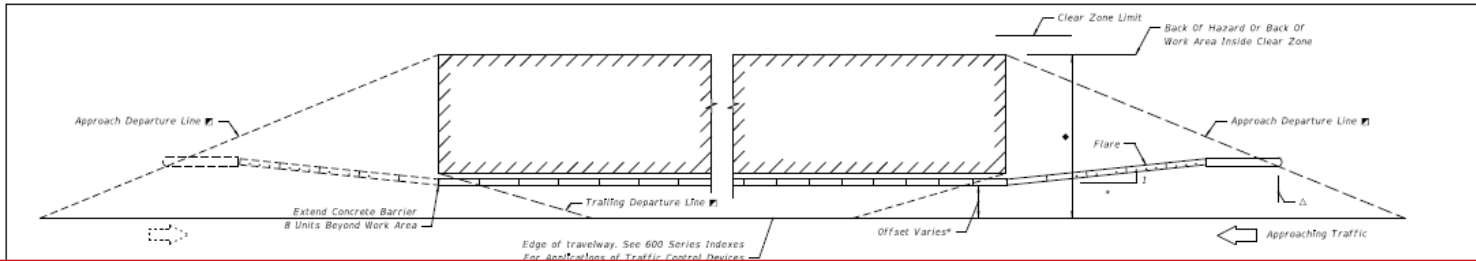
ALIGNMENT AND LENGTH OF NEED

LAST REVISION 01/01/12	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	TEMPORARY CONCRETE BARRIER	INDEX NO. 415	SHEET NO. 2
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Effective January 1st, 2013

Index 415 Sheet 2

Alignment and Length of Need



Proprietary redirective crash cushions designed for use with temporary concrete barriers have the beginning length of need and departure line intersect point indicated on the respective QPL drawing for each proprietary crash cushion. Where redirective crash cushions are located on the departure line by their length of need reference point, the wall upstream end unit must be aligned with the crash cushion, and the wall's end unit secured with bolts or stakes. See Sheets 3 through 6 for configurations requiring end unit anchorage.

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The length of barrier wall need is the distance from the approach departure line intersect with the upstream toe of the temporary concrete barrier wall to the trailing departure line intersect with the downstream toe of the temporary concrete barrier wall.

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* The wall offset from the near traffic lane, wall flare rate and wall flare length are to be in conformance with the alignment called for in the plans and the alignments called for by Department Design Standards specified in the plans; in absence of either plan requirement, the offset shall be as determined by the Engineer, and, unless other flare rates are approved by the Engineer the flare rates to be applied are 1:10 or flatter for speeds ≤ 45 mph and 1:15 or flatter for speeds ≥ 50 mph* see Index No. 642 for other flare rates on freeway facilities.

The surface cross slope approaching the barrier wall and continuing across the required deflection space shall not exceed a rate of 1 vertical: 10 horizontal.

■ Departure Rates
1:16 For Speeds ≤ 45 mph
1:13 For Speeds ≥ 50 mph

■ Area Shielded When Work Zone Hazards Or The Work Area Occupy Space Less Than Clear Zone Width

○ Area Shielded When Work Zone Hazards Or The Work Area Extend To Or Beyond Clear Zone Limit

••••• Dot Indicates Number And Position Of Bolts Or Stakes

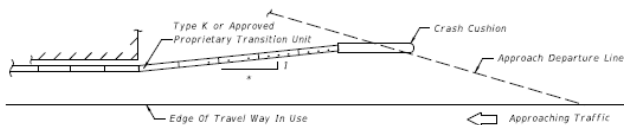
ALIGNMENT AND LENGTH OF NEED

LAST REVISION 01/01/12	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	TEMPORARY CONCRETE BARRIER	INDEX NO. 415	SHEET NO. 2
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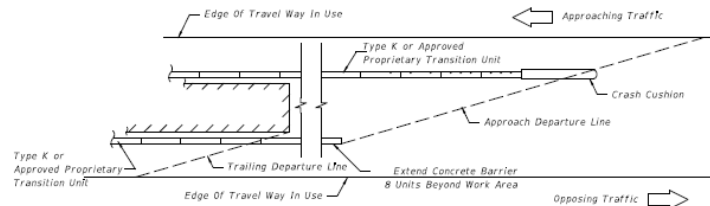
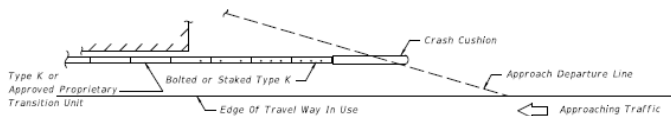
Effective January 1st, 2013

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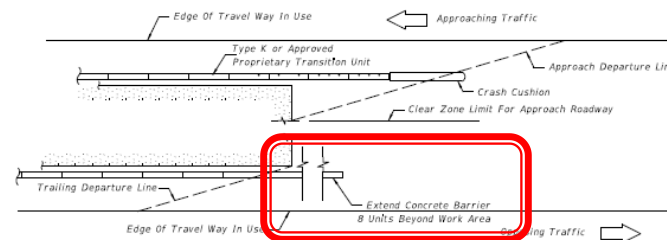
Barrier End Unit Anchorage



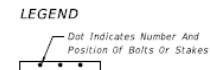
* Flare rates to be applied are 1:10 or flatter for speeds ≤ 45 mph and 1:15 or flatter for speeds ≥ 50 mph



MEDIAN HAZARDS WITHIN CLEAR ZONES BOTH ROADWAYS



MEDIAN HAZARDS EXTENDS TO OR BEYOND CLEAR ZONES BOTH ROADWAYS



BARRIER END UNIT ANCHORAGE

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FDOT DESIGN STANDARDS
2013

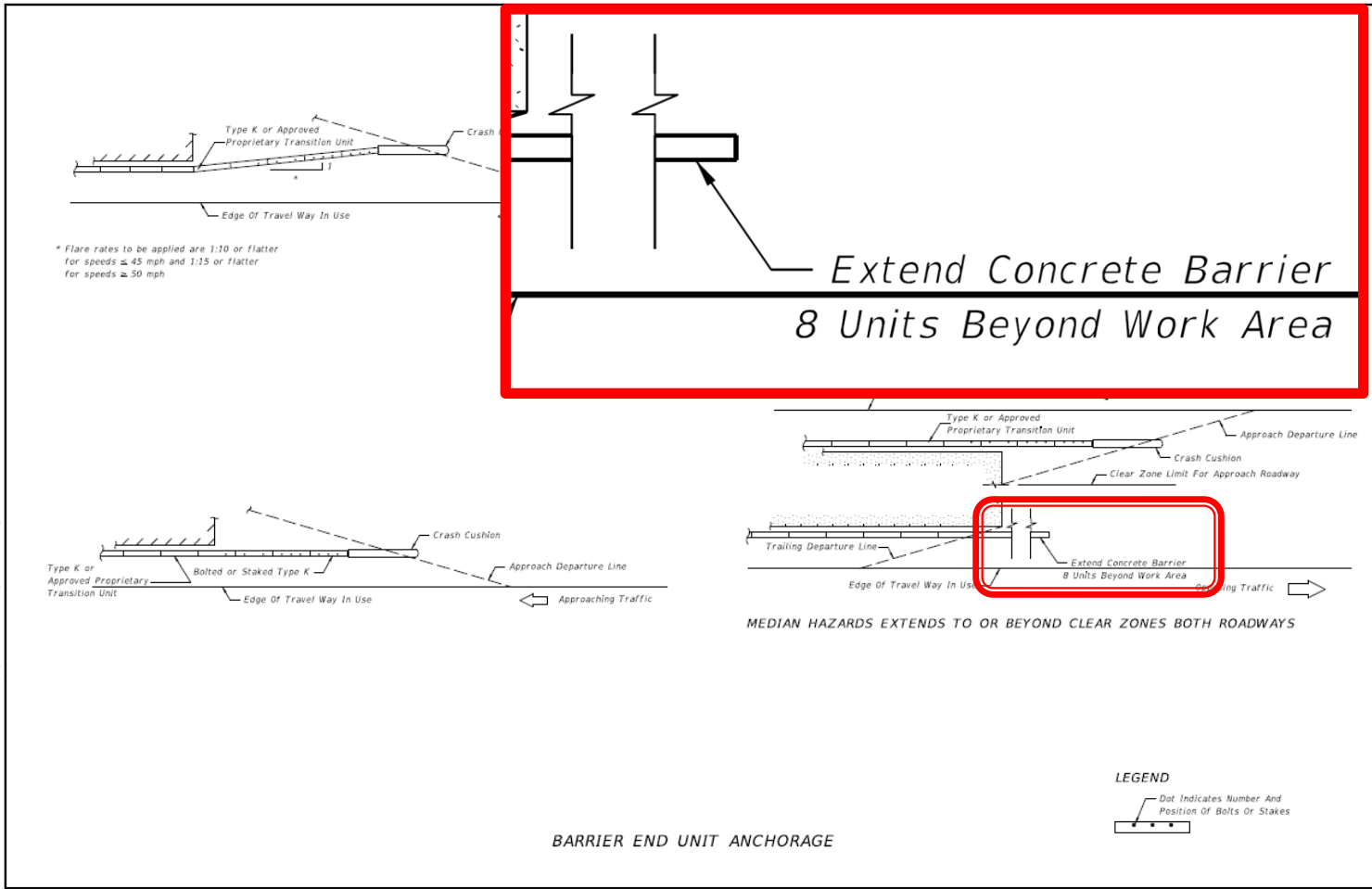
TEMPORARY CONCRETE BARRIER

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Barrier End Unit Anchorage



BARRIER END UNIT ANCHORAGE

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Effective January 1st, 2013

Index 801 Sheet 1

Fence Type A

GENERAL NOTES

1. This fence to be provided generally in rural areas. For supplemental information see Section 550 of the FDOT Specifications.
2. Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A116, No. 9 Grade 60, Design Number 1047-6-9, with Class 3 zinc coating; No. 12 1/2 Grade 175, Design Number 1047-6-12 1/2, with a 10 1/2 gage top and bottom wire and with Class 3 zinc coating; or aluminum coated steel, meeting the requirements of ASTM A574, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft.². For additional information see payment note below.
3. Fence shall be installed with wire side to private property except on horizontal curves greater than 3° the fence shall be installed so as to pull against all posts.
4. Posts may be either timber, steel, recycled plastic or concrete. Unless a specific post material is called for in the plans, the Contractor may elect to use either a single material or a combination of timber, steel, recycled plastic or concrete materials. Line posts of one material may be used with corner, pull, and end post assemblies of a different material. Line posts of only one optional material and pull post assemblies of only one optional material will be permitted between corner and end post assemblies. Within individual corner and end post assemblies only one optional material will be permitted.
5. Timber posts shall meet the material requirements of Specification Section 954. Timber line posts are to be minimum 4" diameter. Timber corner, pull, approach and end posts are to be a minimum 5" diameter. Timber braces are to be minimum 4" diameter.
 - (A) Staples for line posts to be 1 1/2" minimum length; for approach, corner and pull posts 1 1/2" minimum length. At approach, corner and pull posts, staple every line wire. At line posts, staple every line wire in top half and alternate line wires in bottom half. Staples shall be driven diagonally across the line wire with the points in separate grains.
 - (B) Connections between timber posts and braces to be provided by dowels as shown in fastener details.
 - (C) Wire to be wrapped and tied, as shown in the splice details, at the following locations:
 - (a) All end posts, (b) Corner post, including the assemblies at vertical breaks of 15° or more and (c) Pull posts where the wire is not spliced and pulled through the assembly. see General Note 18.
6. Steel posts and braces shall be standard steel posts, galvanized at the rate of 2 oz./ft.², together with necessary hardware and wire clamps meeting the following requirements:
 - (A) Line posts: 8' long, 1.33 lbs./ft., roll formed studing; anchor plate attached (23 in.)
 - (B) Approach posts: 2 1/2"x2 1/2"xW" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - (C) Pull, end and corner posts: 2 1/2"x2 1/2"xW" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - (D) Braces: 2"x2 1/2" angles with necessary hardware and fabricated for attaching to post.
 - (E) The pull, corner, approach and end posts are to be set in concrete as per detail. (Also see General Note No. 15)
7. Recycled plastic posts shall meet the following material requirements: Line posts shall have a minimum section of 4" round or 4" square. Plastic posts shall not be used as corner, pull, end or approach posts unless such use is specifically detailed in the plans. The straightness of the post shall comply with 254-5 for timber post. The flexural strength shall meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber for No. 2SR Stress Rated Grade Timber. Plastic posts can be set by either digging and tamped backfill or by driving into full depth preformed holes 1/2" to 1/2" smaller than cross section of post. Staples for fabric and barbed wire connection to plastic line posts shall be the same size, count and location as that for timber posts.
8. The Contractor, at his option, may use any suitable precast or prestressed concrete posts; however, approval by the Engineer, of posts not shown on this index, will be required prior to construction of the fence. Precast posts shall be Class I concrete. Prestressed posts shall be Class III concrete. Lengths of concrete post to be as indicated for timber posts.
9. Aluminum post, braces and accessory framing hardware shall not be used unless the plans specifically detail their application or the Engineer specifically approves their incorporation in fence construction or repair. Aluminum framed gates are permitted as described in General Note 19.
10. The woven wire shall be attached to steel and concrete posts by a minimum of five tie wires. The single wire ties shall be applied to the top, bottom and three Intermittent line wires. The ends of each tie wire shall have a minimum of two tight turns around the line wire. Tie wires shall be steel wire not less than 0.120" diameter, zinc coating Class 3, soft temper, in accordance with ASTM A641.
11. Steel Barbed Wire can be either of the following types:
 - Type I: This type shall conform to the requirements of ASTM A121, with two strands of 12 1/2 gage wire; four-point barbs, wire size 14 gage, twisted around both line wires; and, Class 3 coating, Design No. 12-4-5-14R.
 - Type IIIA: This type same as Type I except the two strand wires are twisted in alternating directions between consecutive barbs.
 - Type IIIB: This type shall conform to the requirements of ASTM A121 with two strands of 15 1/2 gage high tensile wire; four-point barbs, wire size 16 1/2 gage twisted around both line wires; and Class 3 coating, Design No. 15-4-5-16R.
 Aluminum Barbed Wire shall be fabricated of two strands of 0.110-inch wire with 0.08-inch diameter four-point barbs spaced at approximately 5 1/2", and at a maximum spacing of 6". The wire for the strands and for the barbs shall be of ASTM B211M Alloy 5052-H38 or equal.
12. The woven wire shall be stretched only until one-half the tension curl has been pulled out of the line wires.
13. Posts to be set by driving or digging. If by digging, the posts shall be set at the center of the hole and the soil tamped securely on all sides.
14. Longer posts than those indicated above may be required by the plans or for deeper installations.
15. Concrete bases for angular steel posts (pull, corner, end and approach) shall be Class NS as specified in Section 347. Materials for Class NS concrete may be proportioned by volume and/or by weight.
16. Pull post assemblies shall be installed at approximately 330' centers except that this maximum interval may be reduced by the Engineer on curves where the radius is less than 3".
17. Corner post assemblies are to be installed at all horizontal and vertical breaks in fence of 15° or more.
18. A maximum length of 1320' of wire may be installed as a unit. For pulls through a pull post assembly the fabric shall be spliced by crimping sleeves only. Pulls through a corner post assembly will not be permitted.
19. Unless otherwise called for in the plans gates shall be commercially available metal swing gates assembled and installed in accordance with the manufacturer's specifications as approved by the Engineer. Chain link swing gates in accordance with Index No. 802 may be substituted for metal swing gates as approved by the Engineer. Gate size is full opening width whether single leaf or double leaves. Payment for gates shall include the gate, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, EA.
20. For construction purposes, assemblies are defined as follows: End post assemblies shall consist of: one end post, one approach post, two braces, four diagonal tension wires and all necessary fittings and hardware. Pull post assemblies shall consist of: one pull post, two braces, four diagonal tension wires and necessary fittings and hardware. Corner post assemblies shall consist of: one corner post, two approach posts, four braces, eight diagonal tension wires and all necessary fittings and hardware.
21. All posts, braces, tension wires, fabric, tie wires, Class NS concrete, and all miscellaneous fittings and hardware to be included in the cost for Fencing, LF. Fencing shall be inclusive of the lengths of pull, end and corner post assemblies, but exclusive of gate widths.

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LAST REVISION	DESCRIPTION	DATE	INDEX NO.	SHEET NO.
07/01/12			801	1



FDOT DESIGN STANDARDS
2013

FENCE TYPE A

Effective January 1st, 2013

Index 801 Sheet 1

Fence Type A

GENERAL NOTES

1. This fence to be provided generally in rural areas. For supplemental information see Section 550 of the FDOT Specifications.

2. Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A116, No. 9 Grade 60, Design Number 1047-6-9, with Class 3 zinc coating; No. 12 1/2 Grade 175, Design Number 1047-6-12 1/2, with a 10 1/2 gage top and bottom wire and with Class 3 zinc coating; or aluminum coated steel, meeting the requirements of ASTM A584, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft.². For additional information see payment note below.

3. Fence shall be installed with wire side to private property except on horizontal curves greater than 3° the fence shall be installed so as to pull against all posts.

4. Posts may be either timber, steel, recycled plastic or concrete. Unless a specific post material is called for in the plans, the Contractor may elect to use either a single material or a combination of timber, steel, recycled plastic or concrete materials. Line posts of one material may be used with corner, pull and end post assemblies of a different material. Line posts of only one optional material and pull post assemblies of only one optional material will be permitted between corner and end post assemblies. Within individual corner and end post assemblies only one optional material will be permitted.

5. Timber posts shall meet the material requirements of Specification Section 954. Timber line posts are to be

10. The woven wire shall be attached to steel and concrete posts by a minimum of five tie wires. The single wire ties shall be applied to the top, bottom and three Intermittent line wires. The ends of each tie wire shall have a minimum of two tight turns around the line wire. Tie wires shall be steel wire not less than 0.120" diameter, zinc coating Class 3, soft temper, in accordance with ASTM A641.

11. Steel Barbed Wire can be either of the following types:

Type I: This type shall conform to the requirements of ASTM A121, with two strands of 12½ gage wire; four-point barbs, wire size 14 gage, twisted around both line wires; and, Class 3 coating, Design No. 12-4-5-14R.

Type IIA: This type same as Type I except the two strand wires are twisted in alternating directions between consecutive barbs.

Type IIB: This type shall conform to the requirements of ASTM A121 with two strands of 15 ½ gage high tensile wire; four-point barbs, wire size 16 ½ gage twisted around both line wires; and Class 3 coating, Design No. 15-4-5-16R.

Aluminum Barbed Wire shall be fabricated of two strands of 0.110-inch wire with 0.08-inch diameter four-point barbs spaced at approximately 5½", and at a maximum spacing of 6". The wire for the strands and for the barbs shall be of ASTM B211M Alloy 5052-H38 or equal.

12. The woven wire shall be stretched only until one-half the tension curl has been pulled out of the line wires.

2. Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A116, No. 9 Grade 60, Design Number 1047-6-9, with Class 3 zinc coating; No. 12 1/2 Grade 175, Design Number 1047-6-12 1/2, with a 10 1/2 gage top and bottom wire and with Class 3 zinc coating; or aluminum coated steel, meeting the requirements of ASTM A584, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft.². For additional information see payment note below.

Note No. 15)

7. Recycled plastic posts shall meet the following material requirements: Line posts shall have a minimum section of 4" round or 4" square. Plastic posts shall not be used as corner, pull, end or approach posts unless such use is specifically detailed in the plans. The straightness of the post shall comply with 254-5 for timber post. The flexural strength shall meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber for No. 2SR Stress Rated Grade Timber. Plastic posts can be set by either digging and tamped backfill or by driving into full depth preformed holes 1/2" to 3/4" smaller than cross section of post. Staples for fabric and barbed wire connection to plastic line posts shall be the same size, count and location as that for timber posts.

8. The Contractor, at his option, may use any suitable precast or prestressed concrete posts; however, approval by the Engineer, of posts not shown on this index, will be required prior to construction of the fence. Precast posts shall be Class I concrete. Prestressed posts shall be Class III concrete. Lengths of concrete post to be as indicated for timber posts.

9. Aluminum post, braces and accessory framing hardware shall not be used unless the plans specifically detail their application or the Engineer specifically approves their incorporation in fence construction or repair. Aluminum framed gates are permitted as described in General Note 19.

opening. Gates shall be paid for under the contract unit price for Fence Gates, EA.

20. For construction purposes, assemblies are defined as follows: End post assemblies shall consist of: one end post, one approach post, two braces, four diagonal tension wires and all necessary fittings and hardware. Pull post assemblies shall consist of: one pull post, two braces, four diagonal tension wires and necessary fittings and hardware. Corner post assemblies shall consist of: one corner post, two approach posts, four braces, eight diagonal tension wires and all necessary fittings and hardware.

21. All posts, braces, tension wires, fabric, tie wires, Class NS concrete, and all miscellaneous fittings and hardware to be included in the cost for Fencing, LF. Fencing shall be inclusive of the lengths of pull, end and corner post assemblies, but exclusive of gate widths.

LAST REVISION 07/01/12	DESCRIPTION:	 FDOT DESIGN STANDARDS 2013	FENCE TYPE A	INDEX NO. 801	SHEET NO. 1
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Effective January 1st, 2013


Index 801 Sheet 1

Fence Type A

GENERAL NOTES

1. This fence to be provided generally in rural areas. For supplemental information see Section 550 of the FDOT Specifications.
2. Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A116, No. 9 Grade 60, Design Number 1047-6-9, with Class 3 zinc coating; No. 12 1/2 Grade 175, Design Number 1047-6-12 1/2, with a 10 1/2 gage top and bottom wire and with Class 3 zinc coating; or aluminum coated steel, meeting the requirements of ASTM A584, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft.². For additional information see payment note below.
3. Fence shall be installed with wire side to private property except on horizontal curves greater than 3° the fence shall be installed so as to pull against all posts.
4. Posts may be either timber, steel, recycled plastic or concrete. Unless a specific post material is called for in the plans, the Contractor may elect to use either a single material or a combination of timber, steel, recycled plastic or concrete materials. Line posts of one material may be used with corner, pull and end post assemblies of a different material. Line posts of only one optional material and pull post assemblies of only one optional material will be permitted between corner and end post assemblies. Within individual corner and end post assemblies only one optional material will be permitted.
5. Timber posts shall meet the material requirements of Specification Section 954. Timber line posts are to be minimum 4" diameter. Timber corner, pull, approach and end posts are to be a minimum 5" diameter. Timber braces are to be minimum 4" diameter.
 - (A) Staples for line posts to be 1 1/2" minimum length; for approach, corner and pull posts 1 1/2" minimum length. At approach, corner and pull posts, staple every line wire. At line posts, staple every line wire in top half and alternate line wires in bottom half. Staples shall be driven diagonally across the line wire with the points in separate grains.
 - (B) Connections between timber posts and braces to be provided by dowels as shown in fastener details.
 - (C) Wire to be wrapped and tied, as shown in the splice details, at the following locations:
 - (a) All end posts. (b) Corner post, including the assemblies at vertical breaks of 15° or more and
 - (c) Pull posts where the wire is not spliced and pulled through the assembly. see General Note 18.
6. Steel posts and braces shall be standard steel posts, galvanized at the rate of 2 oz./ft.², together with necessary hardware and wire clamps meeting the following requirements:
 - (A) Line posts: 8' long; 1.33 lbs./ft.; roll formed stud; anchor plate attached (23 in.)
 - (B) Approach posts: 2 1/2"x2 1/2"x1/2" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - (C) Pull, end and corner posts: 2 1/2"x2 1/2"x1/2" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - (D) Braces: 2"x2 1/2" angles with necessary hardware and fabricated for attaching to post.
 - (E) The pull, corner, approach and end posts are to be set in concrete as per detail. (Also see General Note No. 15)
7. Recycled plastic posts shall meet the following material requirements: Line posts shall have a minimum section of 4" round or 4" square. Plastic posts shall not be used as corner, pull, end or approach posts unless such use is specifically detailed in the plans. The straightness of the post shall comply with 254-S for timber post. The flexural strength shall meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber for No. 2SR Stress Rated Grade Timber. Plastic posts can be set by either digging and tamped backfill or by driving into full depth preformed holes 1/2" to 1/2" smaller than cross section of post. Staples for fabric and barbed wire connection to plastic line posts shall be the same size, count and location as that for timber posts.
8. The Contractor, at his option, may use any suitable precast or prestressed concrete posts; however, approval by the Engineer, of posts not shown on this index, will be required prior to construction of the fence. Precast posts shall be Class I concrete. Prestressed posts shall be Class III concrete. Lengths of concrete post to be as indicated for timber posts.
9. Aluminum post, braces and accessory framing hardware shall not be used unless the plans specifically detail their application or the Engineer specifically approves their incorporation in fence construction or repair. Aluminum framed gates are permitted as described in General Note 19.
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11. Steel Barbed Wire can be either of the following types:
 - Type I: This type shall conform to the requirements of ASTM A121, with two strands of 12 1/2 gage wire; four-point barbs, wire size 14 gage, twisted around both line wires; and, Class 3 coating, Design No. 12-4-S-140.
 - Type II: This type same as Type I except the two strand wires are twisted in alternating directions between barbs.
 - Type III: This type shall conform to the requirements of ASTM A121 with two strands of 15 1/2 gage high tensile wire; four-point barbs, wire size 16 1/2 gage twisted around both line wires; and Class 3 coating, Design No. 15-4-S-160.
 barbs spaced at approximately 5/8", and at a maximum spacing of 6". The wire for the strands and for the barbs shall be of ASTM B211M Alloy 5052-H38 or equal.
12. The woven wire shall be stretched only until one-half the tension curl has been pulled out of the line wires.
13. Posts to be set by driving or digging. If by digging, the posts shall be set at the center of the hole and the soil tamped securely on all sides.
14. Longer posts than those indicated above may be required by the plans or for deeper installations.
15. Concrete bases for angular steel posts (pull, corner, end and approach) shall be Class NS as specified in Section 347. Materials for Class NS concrete may be proportioned by volume and/or by weight.
16. Pull post assemblies shall be installed at approximately 330° centers except that this maximum interval may be reduced by the Engineer on curves where the radius is less than 3°.
17. Corner post assemblies are to be installed at all horizontal and vertical breaks in fence of 15° or more.
18. A maximum length of 1320° of wire may be installed as a unit. For pulls through a pull post assembly the fabric shall be spliced by crimping sleeves only. Pulls through a corner post assembly will not be permitted.
19. Unless otherwise called for in the plans gates shall be commercially available metal swing gates assembled and installed in accordance with the manufacturer's specifications as approved by the Engineer. Chain link swing gates in accordance with Index No. 802 may be substituted for metal swing gates as approved by the Engineer. Gate size is full opening width whether single leaf or double leaves. Payment for gates shall include the gate, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, EA.
20. For construction purposes, assemblies are defined as follows: End post assemblies shall consist of: one end post, one approach post, two braces, four diagonal tension wires and all necessary fittings and hardware. Pull post assemblies shall consist of: one pull post, two braces, four diagonal tension wires and necessary fittings and hardware. Corner post assemblies shall consist of: one corner post, two approach posts, four braces, eight diagonal tension wires and all necessary fittings and hardware.
21. All posts, braces, tension wires, fabric, tie wires, Class NS concrete, and all miscellaneous fittings and hardware to be included in the cost for Fencing, LF. Fencing shall be inclusive of the lengths of pull, end and corner post assemblies, but exclusive of gate widths.

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LAST REVISION 07/01/12	DESCRIPTION REVISED		FDOT DESIGN STANDARDS 2013	FENCE TYPE A	INDEX NO. 801	SHEET NO. 1
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Effective January 1st, 2013

Index 801 Sheet 1

Fence Type A

Type IIB: This type shall conform to the requirements of ASTM A121 with two strands of 15 1/2 gage high tensile wire; four-point barbs, wire size 16 1/2 gage twisted around both line wires; and Class 3 coating, Design No. 15-4-5-16R.

of the FDOT Specifications.

2. Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A116, No. 9 Grade 60, Design Number 1047-6-9, with Class 3 zinc coating; No. 12 1/2 Grade 175, Design Number 1047-6-12 1/2, with a 10 1/2 gage top and bottom wire and with Class 3 zinc coating; or aluminum coated steel, meeting the requirements of ASTM A584, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft.². For additional information see payment note below.
3. Fence shall be installed with wire side to private property except on horizontal curves greater than 3° the fence shall be installed so as to pull against all posts.
4. Posts may be either timber, steel, recycled plastic or concrete. Unless a specific post material is called for in the plans, the Contractor may elect to use either a single material or a combination of timber, steel, recycled plastic or concrete materials. Line posts of one material may be used with corner, pull and end post assemblies of a different material. Line posts of only one optional material and pull post assemblies of only one optional material will be permitted between corner and end post assemblies. Within individual corner and end post assemblies only one optional material will be permitted.
5. Timber posts shall meet the material requirements of Specification Section 954. Timber line posts are to be minimum 4" diameter. Timber corner, pull, approach and end posts are to be a minimum 5" diameter. Timber braces are to be minimum 4" diameter.
 - (A) Staples for line posts to be 1 1/2" minimum length; for approach, corner and pull posts 1 1/2" minimum length. At approach, corner and pull posts, staple every line wire. At line posts, staple every line wire in top half and alternate line wires in bottom half. Staples shall be driven diagonally across the line wire with the points in separate grains.
 - (B) Connections between timber posts and braces to be provided by dowels as shown in fastener details.
 - (C) Wire to be wrapped and tied, as shown in the splice details, at the following locations:
 - (a) All end posts, (b) Corner post, including the assemblies at vertical breaks of 15° or more and
 - (c) Pull posts where the wire is not spliced and pulled through the assembly: see General Note 18.
6. Steel posts and braces shall be standard steel posts, galvanized at the rate of 2 oz./ft.², together with necessary hardware and wire clamps meeting the following requirements:
 - (A) Line posts: 8' long; 1.33 lbs./ft.; roll formed studing; anchor plate attached (23 in.)
 - (B) Approach posts: 2 1/2"x2 1/2"x1/2" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - (C) Pull, end and corner posts: 2 1/2"x2 1/2"x1/2" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - (D) Braces: 2"x2 1/2" angles with necessary hardware and fabricated for attaching to post.
 - (E) The pull, corner, approach and end posts are to be set in concrete as per detail. (Also see General Note No. 15)
7. Recycled plastic posts shall meet the following material requirements: Line posts shall have a minimum section of 4" round or 4" square. Plastic posts shall not be used as corner, pull, end or approach posts unless such use is specifically detailed in the plans. The straightness of the post shall comply with 254-5 for timber post. The flexural strength shall meet the requirements of the latest edition of the Southern Pine Inspection Bureau's Standard Grading Rules for Southern Pine Lumber for No. 2SR Stress Rated Grade Timber. Plastic posts can be set by either digging and tamped backfill or by driving into full depth preformed holes 1/2" to 3/4" smaller than cross section of post. Staples for fabric and barbed wire connection to plastic line posts shall be the same size, count and location as that for timber posts.
8. The Contractor, at his option, may use any suitable precast or prestressed concrete posts; however, approval by the Engineer, of posts not shown on this index, will be required prior to construction of the fence. Precast posts shall be Class I concrete. Prestressed posts shall be Class III concrete. Lengths of concrete post to be as indicated for timber posts.
9. Aluminum post, braces and accessory framing hardware shall not be used unless the plans specifically detail their application or the Engineer specifically approves their incorporation in fence construction or repair. Aluminum framed gates are permitted as described in General Note 19.

wire ties shall be applied to the top, bottom and three Intermittent line wires. The ends of each tie wire shall have a minimum of two tight turns around the line wire. Tie wires shall be steel wire not less than 0.120" diameter, zinc coating Class 3, soft temper, in accordance with ASTM A641.

11. Steel Barbed Wire can be either of the following types:

Type I: This type shall conform to the requirements of ASTM A121, with two strands of 12 1/2 gage wire; four-point barbs, wire size 14 gage, twisted around both line wires; and, Class 3 coating, Design No. 12-4-5-14R.

Type II: This type same as Type I except the two strand wires are twisted in alternating directions between

Type IIB: This type shall conform to the requirements of ASTM A121 with two strands of 15 1/2 gage high tensile wire; four-point barbs, wire size 16 1/2 gage twisted around both line wires; and Class 3 coating, Design No. 15-4-5-16R.

barbs spaced at approximately 5/8", and at a maximum spacing of 6". The wire for the strands and for the barbs shall be of ASTM B211M Alloy 30S2-H38 or equal.

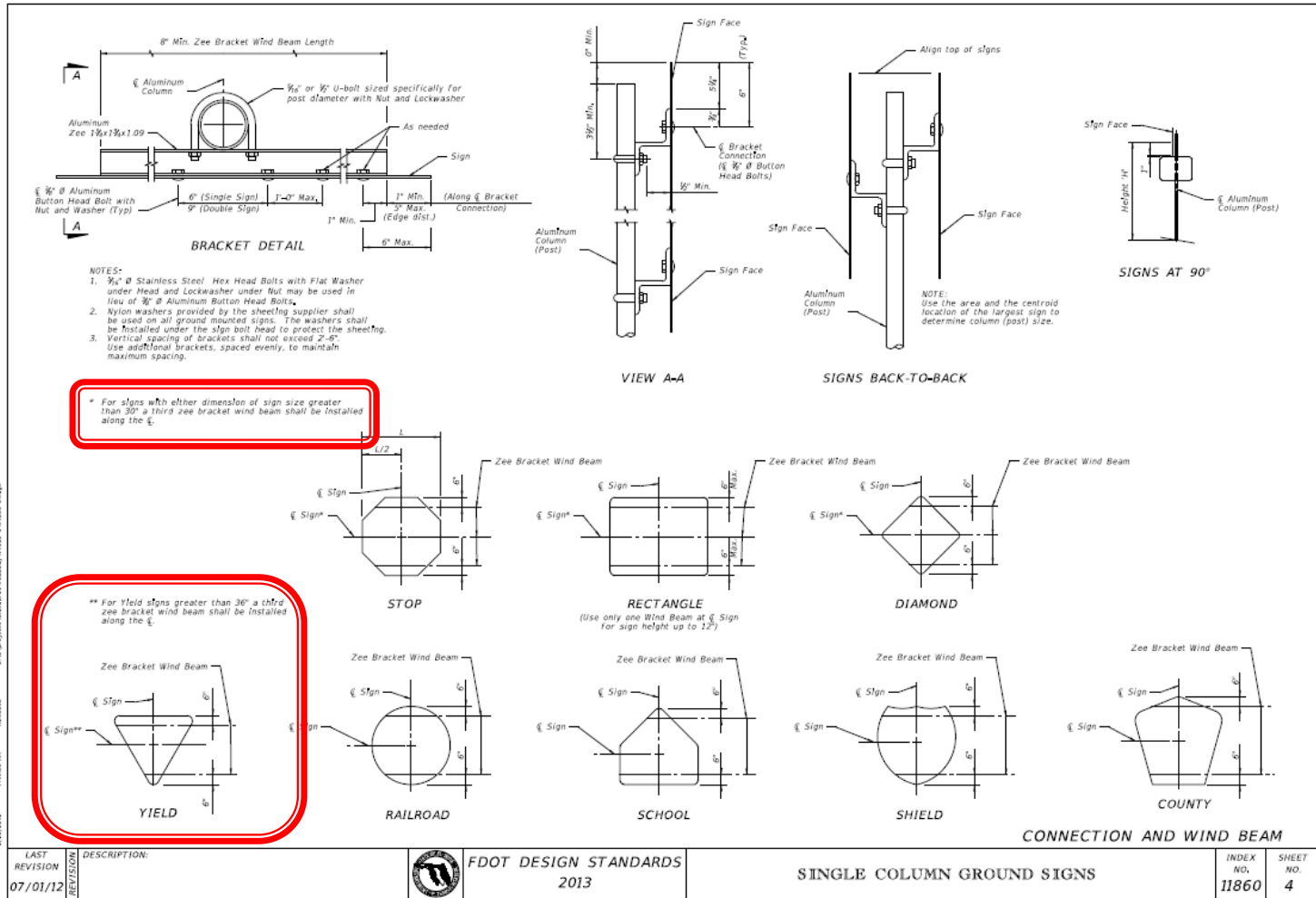
12. The woven wire shall be stretched only until one-half the tension curl has been pulled out of the line wires.
13. Posts to be set by driving or digging. If by digging, the posts shall be set at the center of the hole and the soil tamped securely on all sides.
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18. A maximum length of 1320' of wire may be installed as a unit. For pulls through a pull post assembly the fabric shall be spliced by crimping sleeves only. Pulls through a corner post assembly will not be permitted.
19. Unless otherwise called for in the plans gates shall be commercially available metal swing gates assembled and installed in accordance with the manufacturer's specifications as approved by the Engineer. Chain link swing gates in accordance with Index No. 802 may be substituted for metal swing gates as approved by the Engineer. Gate size is full opening width whether single leaf or double leaves. Payment for gates shall include the gate, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, EA.
20. For construction purposes, assemblies are defined as follows: End post assemblies shall consist of: one end post, one approach post, two braces, four diagonal tension wires and all necessary fittings and hardware. Pull post assemblies shall consist of: one pull post, two braces, four diagonal tension wires and necessary fittings and hardware. Corner post assemblies shall consist of: one corner post, two approach posts, four braces, eight diagonal tension wires and all necessary fittings and hardware.
21. All posts, braces, tension wires, fabric, tie wires, Class NS concrete, and all miscellaneous fittings and hardware to be included in the cost for Fencing, LF. Fencing shall be inclusive of the lengths of pull, end and corner post assemblies, but exclusive of gate widths.

LAST REVISION	DESCRIPTION	FDOT DESIGN STANDARDS	INDEX NO.	SHEET NO.
07/01/12		2013	801	1

Effective January 1st, 2013

Index 11860 Sheet 4

Single Column Ground Signs



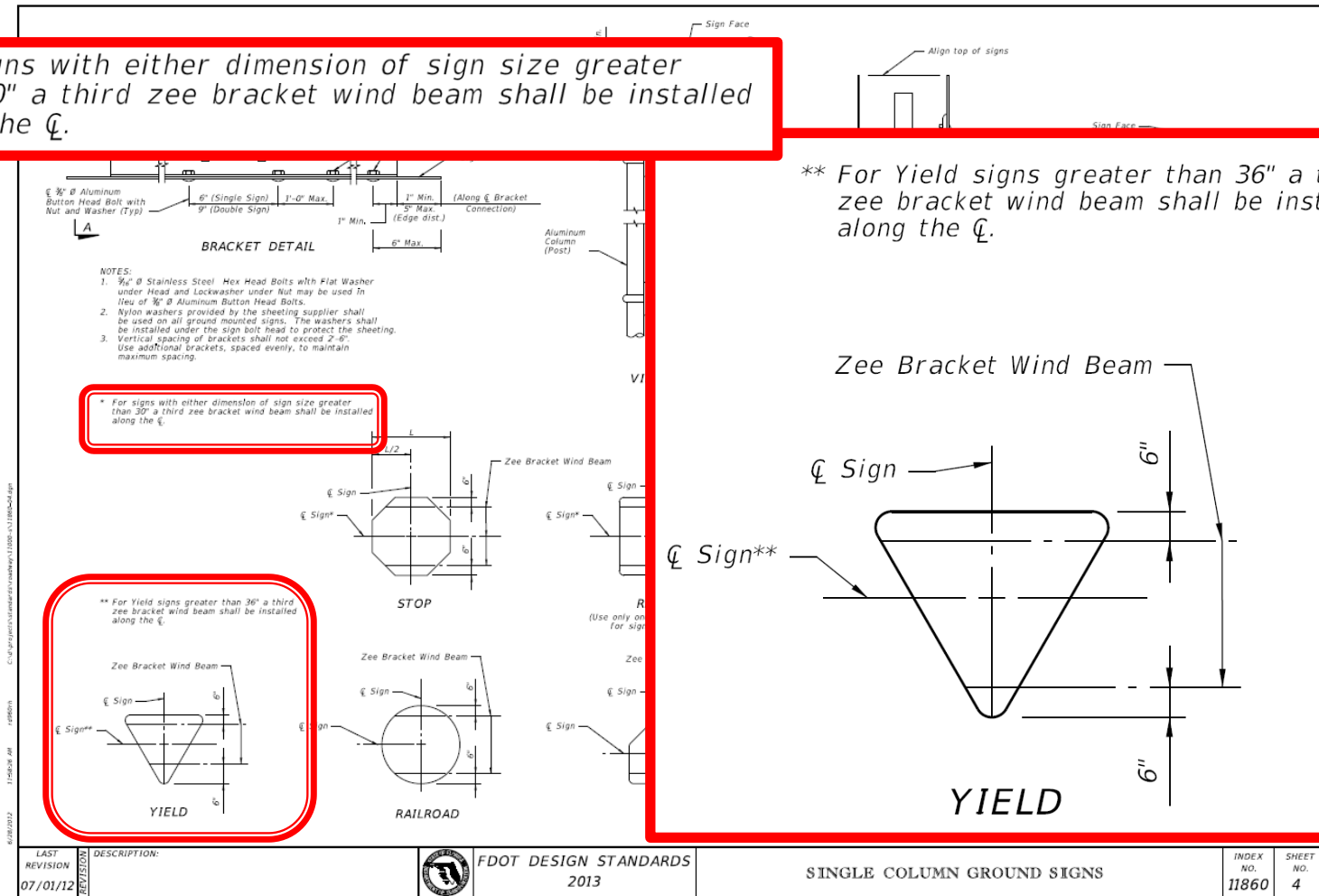
Effective January 1st, 2013

Index 11860 Sheet 4

Single Column Ground Signs

* For signs with either dimension of sign size greater than 30" a third zee bracket wind beam shall be installed along the ζ .


** For Yield signs greater than 36" a third zee bracket wind beam shall be installed along the ζ .



Effective January 1st ,2013

Design Bulletin 12-11

Single Post Median Barrier Mounted Sign Support



Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399-0450

RICK SCOTT
GOVERNOR

ANANTH PRASAD, P.E.
SECRETARY

July 27, 2012

****REVISED****
ROADWAY DESIGN BULLETIN 12-11
DESIGN STANDARDS REVISION R1302(Revised)
DESIGN STANDARDS REVISION R2013-01
DCE MEMORANDUM 21-12
STRUCTURES DESIGN BULLETIN 12-09
ESTIMATES BULLETIN 12-07
(FHWA Approved: 7/27/2012)

TO: DISTRICT DESIGN ENGINEERS
DISTRICT CONSTRUCTION ENGINEERS
PLANS PREPARATION MANUAL HOLDERS

FROM: Duane Brautigam, P.E., Director, Office of Design
David A. Sadler, P.E., Director, Office of Construction
Robert V. Robertson, P.E., State Structures Design Engineer
Phillip Greg Davis, P.E., State Estimates Engineer

CC: Brian Blanchard, Tom Byron, Duane Brautigam, Tim Lattner, Rudy Powell, Bob Burleson, Chris Richter, Chad Thompson, Heather Dean, Rafiq Darji

SUBJECT: BARRIER AND TRAFFIC RAILING MOUNTED SIGNS
DESIGN STANDARDS REVISION (R1302), DATED JULY 1, 2012

BACKGROUND:

As a follow-up to Roadway Design Bulletin 12-05 and Structures Design Bulletin 12-03, titled 'Median Traffic Railing Mounted Signs', the Department has developed a design standard for single post median barrier mounted sign supports. Design Standard Index No. 11871 is the new design standard that addresses installing permanent and temporary sign supports on both permanent and temporary barriers and traffic railings.

DESIGN REQUIREMENTS:

For permanent signs, Index 11871 can only be used for the following signs which are considered critical to safety: No U-Turns (R3-1) w/ Official Use Only (FTP 65-06), Left Lane Ends (W9-1), Lane Ends Merge Right (W9-2) and Merge Symbol (W4-2).

For all temporary/work zone signs, when Index 600 cannot be achieved for post mounted signs and barrier or traffic railing exists, Index 11871 shall be used.

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Effective January 1st ,2013

Design Bulletin 12-11

Single Post Median Barrier Mounted Sign Support

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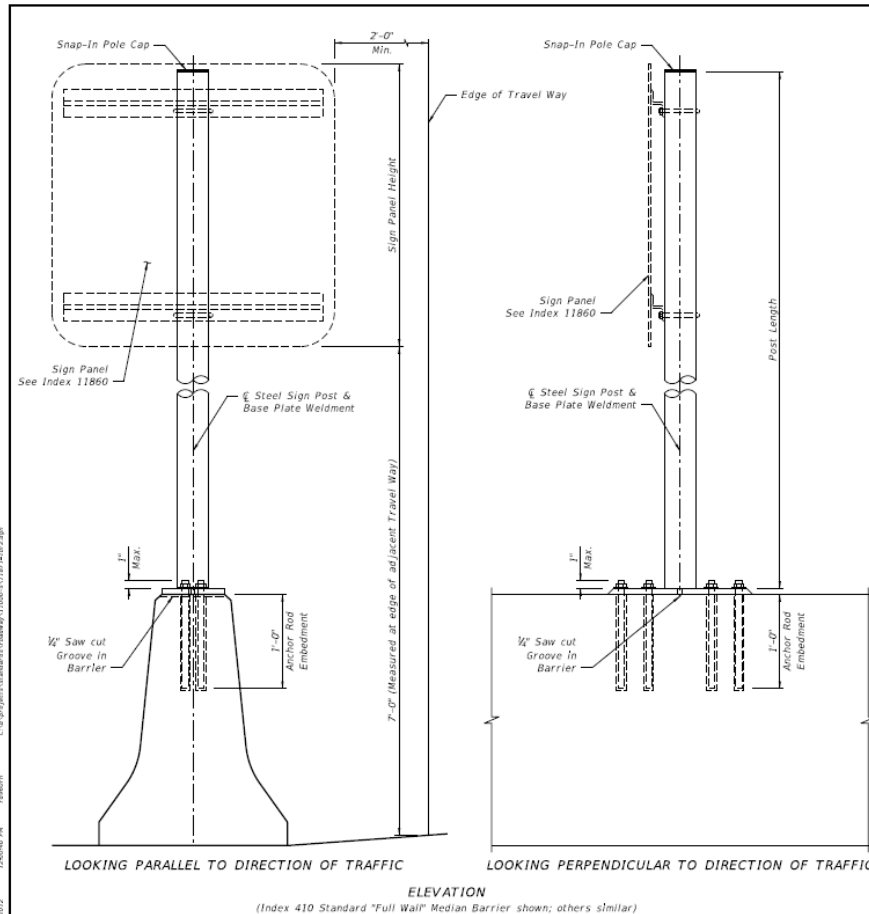
For all temporary/work zone signs, when Index 600 cannot be achieved for post mounted signs and barrier or traffic railing exists, Index 11871 shall be used.

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Effective January 1st, 2013

Index 11871 Sheet 1

Single Post Median Barrier Mounted Sign Support



NOTES:

DESIGN SPECIFICATIONS:
AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals as modified by the FDOT Structures Manual.

WIND SPEEDS:
See Index 11860, "Wind speeds by County" note.

GEOMETRY:
Maximum Sign Panel Height is 6'-0".
Edges of Sign Panels must be a minimum of 2'-0" clear from edge of adjacent Travel Way.

APPLICABILITY:
Work this Index in conjunction with Index No 11860.

SHOP DRAWINGS:
Shop drawings are not required.

PAYMENT:
Include payment for sign support in the cost of the single post sign assembly.

MATERIALS:
Sign Post: ASTM A53 Grade B, NPS Schedule 40 Steel Pipe, sized per Table 1. Maximum post length is 10'-0".

Snap-In Pole Cap: Provide UV and weather-resistant glass-filled polyester cap.

Steel Plates: ASTM A572 Grade 50 or A709 Grade 50.

Welding: Weld in accordance with American Welding Society Structural Welding Code (Steel), ANSI/DWS D1.1 (current edition). Required weld material is E70XX. Nondestructive testing is not required.

Coatings: Hot dip galvanize all steel, including fasteners, in accordance with Section 962. Galvanize Weldment after fabrication.

INSTALLATION:
Placement: For installations on permanent Median Barriers, locate Sign Support a minimum of 5'-0" away from open joints or transitions. For installations on Temporary Barriers, locate Sign Support at the midpoint along the length of a single segment. In all cases, shift locations as needed to avoid conflicts with reinforcement.

Bearing Surface: Surface of the railing must be structurally sound and free of cracks and spalls. Base plate must be flush with the concrete surface; grind any high spots to obtain a flat, smooth surface.

Saw Cut: For permanent installations only, saw cut a 1/2" deep groove transversely across the top of railing at the centerline of base plate vent hole location.

Anchor Rods: Use ASTM F1554 Grade 36, fully threaded rods with A563 or A194 single self-locking hex nuts and F436 washers. Size anchor rods per Table 2.

Adhesive Bonding Material: Install anchor rods using Type HSHV Adhesive Bonding Material System in accordance with Sections 416 & 937.

Removal of Signs: Cut anchor rods flush with top of railing and coat surface with Type F-1 epoxy. Minimum thickness of epoxy is 1/2" extending 2" beyond the location of steel.

Wind Speed (MPH)	Max. Sign Area (SF)	Post Ø (NPS)
70 - All Temporary Signs	< 20	3.0"
110 & 130	< 13.5	3.0"
	13.5 < Sign < 20	3.5"
150	< 13.5	3.5"
	13.5 < Sign < 20	4.0"

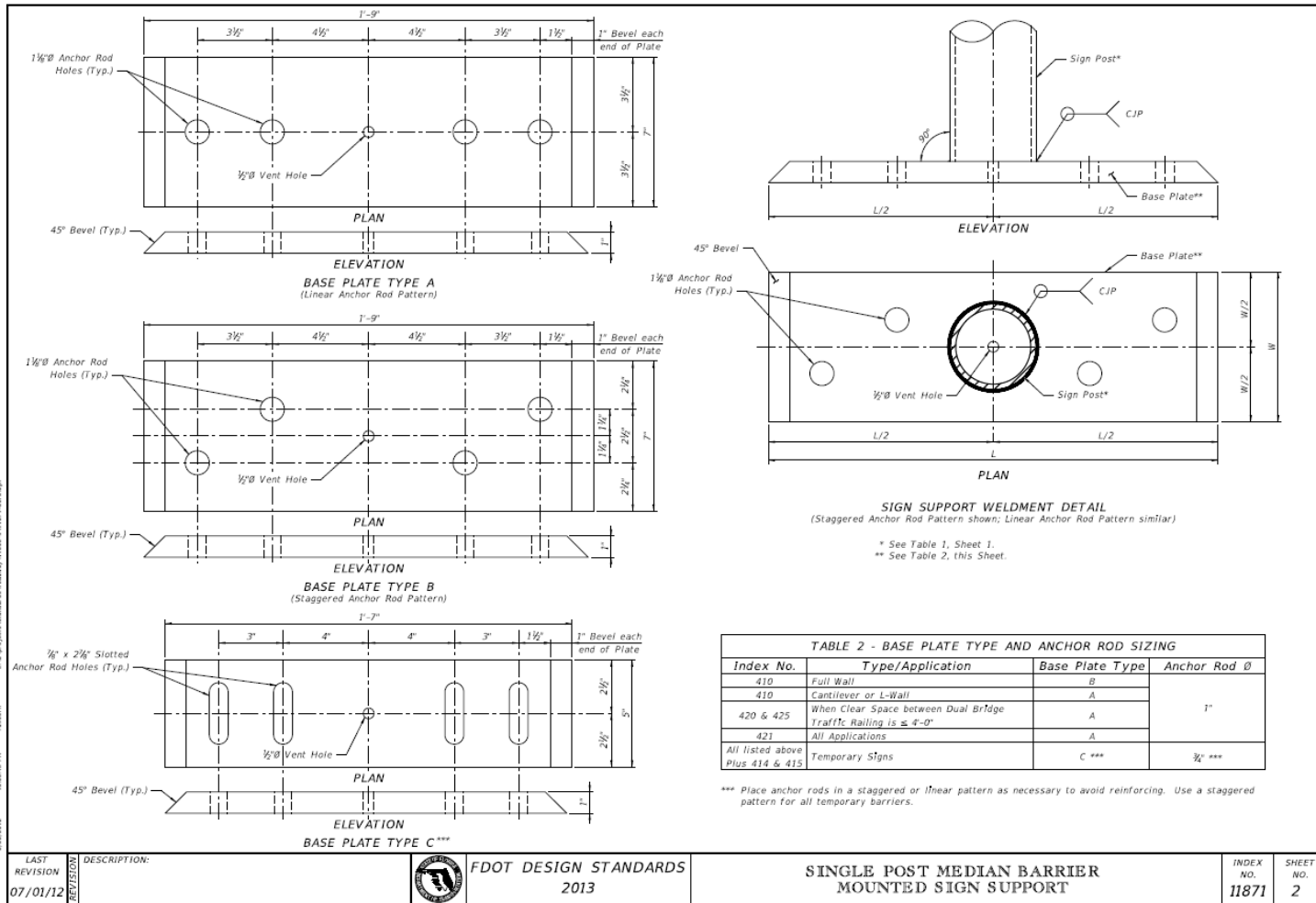
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LAST REVISION 07/01/12	DESCRIPTION:		FDOT DESIGN STANDARDS 2013	SINGLE POST MEDIAN BARRIER MOUNTED SIGN SUPPORT	INDEX NO. 11871	SHEET NO. 1
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Effective January 1st, 2013

Index 11871 Sheet 2

Single Post Median Barrier Mounted Sign Support



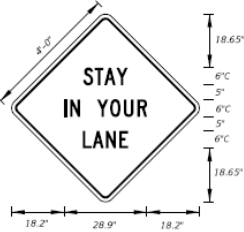
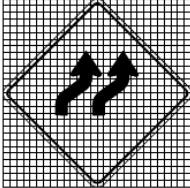
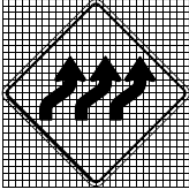
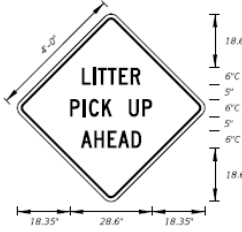
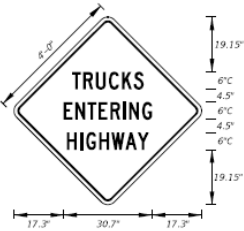

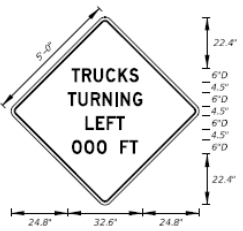
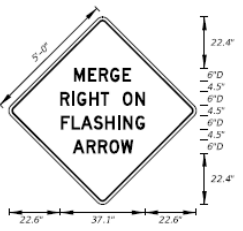


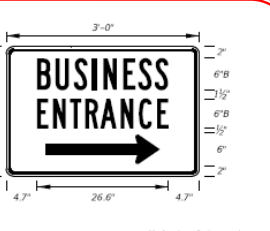
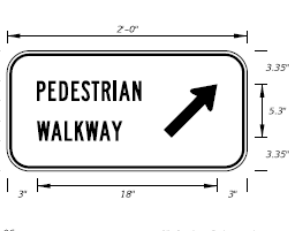

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LAST REVISION 07/01/12	DESCRIPTION: REFERENCE	FDOT DESIGN STANDARDS 2013	SINGLE POST MEDIAN BARRIER MOUNTED SIGN SUPPORT	INDEX NO. 11871	SHEET NO. 2
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Effective January 1st, 2013

Index 17355 Sheet 10

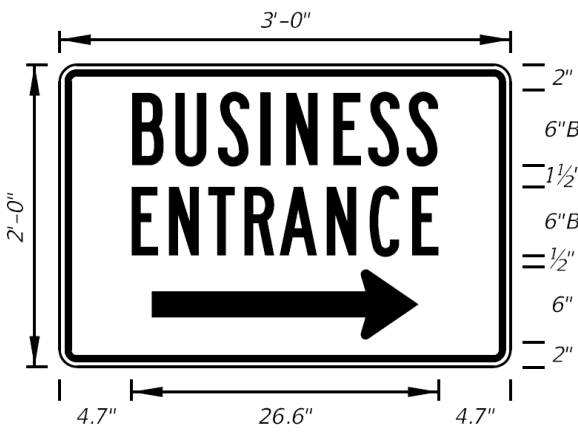
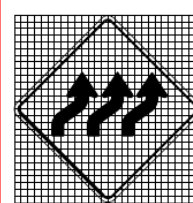

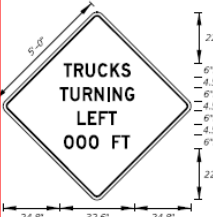
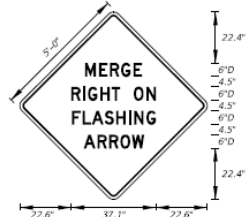
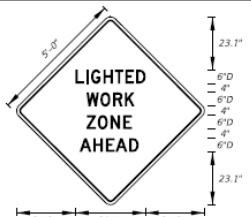

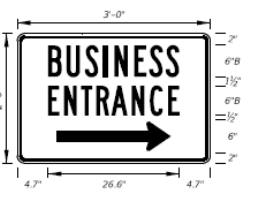

Business Entrance Sign

 <p>MOT-1-06 4' X 4' 2" Radii 3/4" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>	 <p>MOT-2-06 4' X 4' 2" Radii 3/4" Border</p> <p>Orange Background Black Arrows and Border</p>	 <p>MOT-3-06 4' X 4' 2" Radii 3/4" Border</p> <p>Orange Background Black Arrows and Border</p>	 <p>MOT-4-06 4' X 4' 2" Radii 3/4" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>	
 <p>MOT-5-06 4' X 4' 2" Radii 3/4" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>	 <p>MOT-6-06 5' X 5' 2" Radii 3/4" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	 <p>MOT-7-06 5' X 5' 2" Radii 3/4" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	 <p>MOT-8-06 5' X 5' 2" Radii 3/4" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	
 <p>MOT-9-06 5' X 5' 2" Radii 3/4" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	 <p>MOT-10-06 4' X 4' 2" Radii 3/4" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>	 <p>MOT-11-06 3' X 2' 2" Radii 3/4" Border</p> <p>6" Series B Legend Blue Background White Legend and Border</p>	 <p>MOT-12-06 2' X 1' 2" Radii 3/4" Border</p> <p>2" Series B Legend White Background Black Legend and Border</p>	
<p>LAST REVISION: 07/01/12</p> <p>DESCRIPTION:</p>		 <p>FDOT DESIGN STANDARDS 2013</p>	<p>SPECIAL SIGN DETAILS</p> <p>INDEX NO. 17355</p> <p>SHEET NO. 10</p>	

Effective January 1st, 2013

Index 17355 Sheet 10

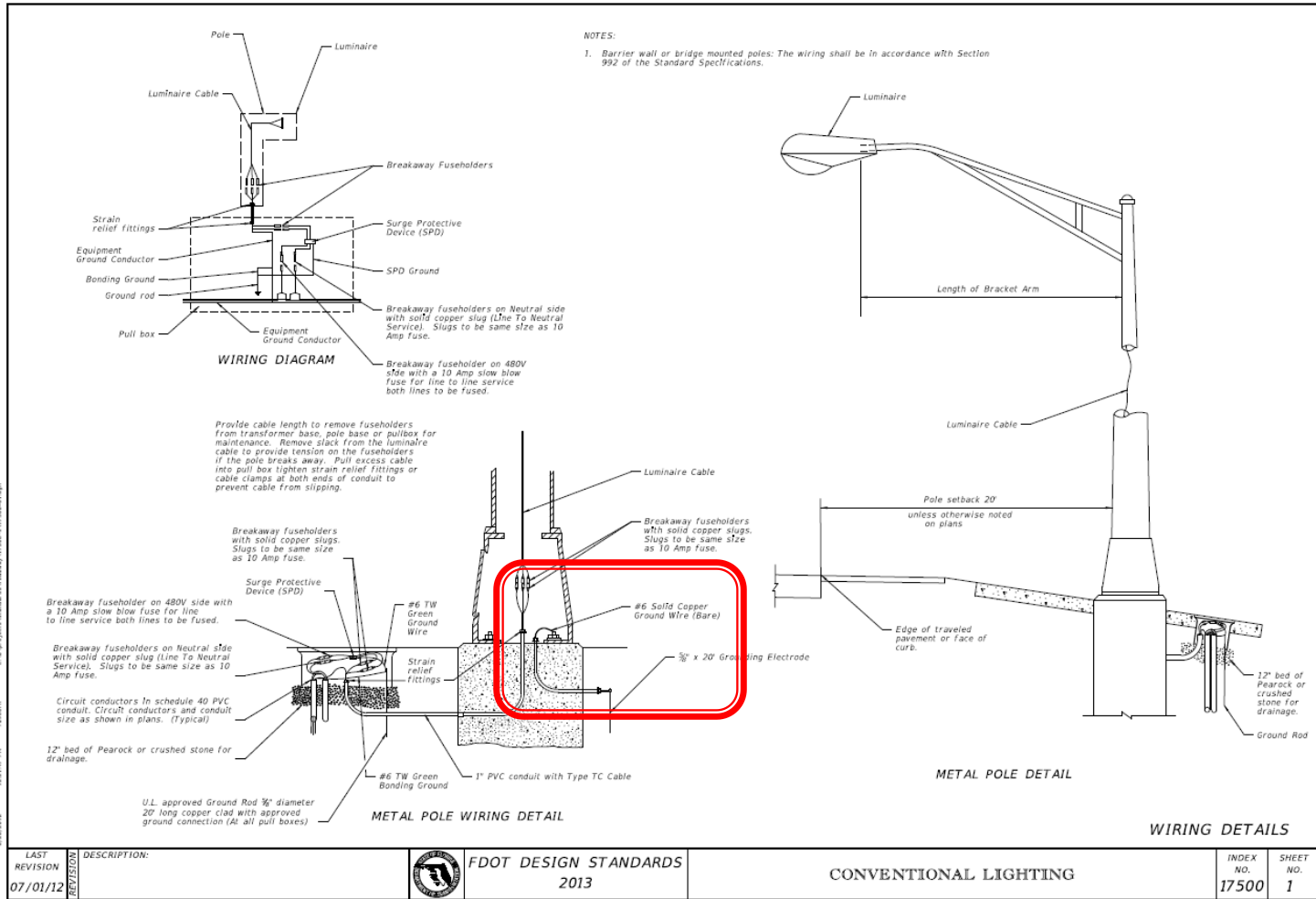
Business Entrance Sign

 <p>MOT-11-06 3' X 2' 2" Radii 3/4" Border</p> <p>6" Series B Legend Blue Background White Legend and Border</p>		 <p>Orange Background Black Arrows and Border</p>	 <p>MOT-4-06 4' X 4' 2" Radii 3/4" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>
 <p>6" Series D Legend Orange Background Black Legend and Border</p>		 <p>6" Series D Legend Orange Background Black Legend and Border</p>	
 <p>MOT-5-06 4' X 4' 2" Radii 3/4" Border</p> <p>6" Series C Legend Orange Background Black Legend and Border</p>	 <p>MOT-6-06 5' X 5' 2" Radii 3/4" Border</p> <p>6" Series D Legend Orange Background Black Legend and Border</p>	 <p>MOT-11-06 3' X 2' 2" Radii 3/4" Border</p> <p>6" Series B Legend Blue Background White Legend and Border</p>	 <p>MOT-12-06 2' X 1' 2" Radii 3/4" Border</p> <p>2" Series B Legend White Background Black Legend and Border</p>
<p>LAST REVISION: 07/01/12</p> <p>DESCRIPTION:</p>		<p>FDOT DESIGN STANDARDS 2013</p>	
		<p>SPECIAL SIGN DETAILS</p>	
		<p>INDEX NO. 17355</p>	<p>SHEET NO. 10</p>

Effective January 1st, 2013

Index 17500 Sheet 1

Metal Pole Wiring



LAST REVISION	DESCRIPTION:
07/01/12	

 FDOT DESIGN STANDARDS 2013

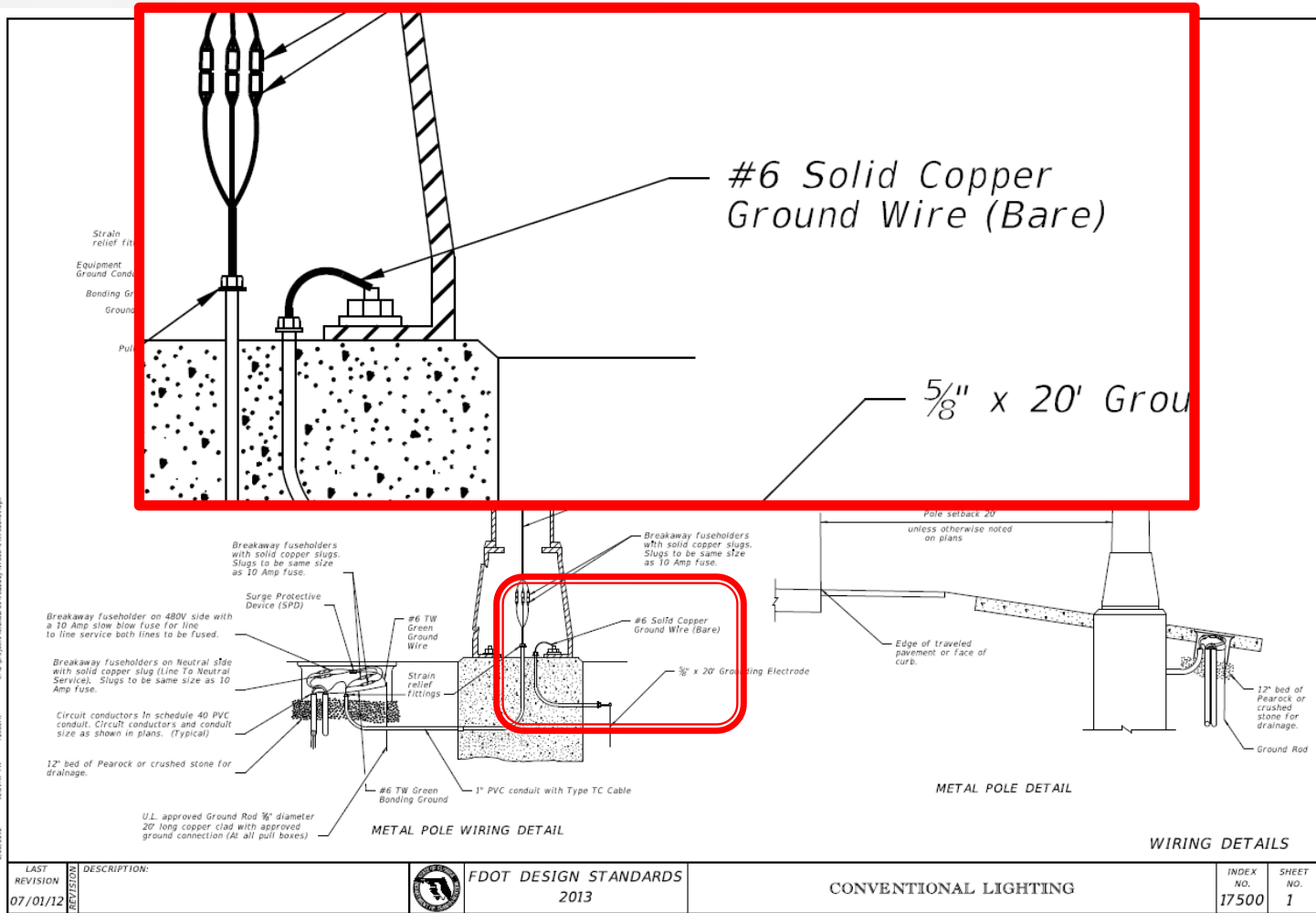
CONVENTIONAL LIGHTING

INDEX NO.	SHEET NO.
17500	1

Effective January 1st ,2013

Index 17500 Sheet 1

Metal Pole Wiring



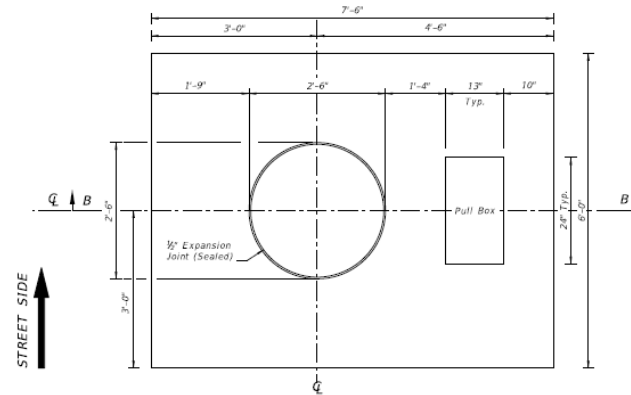
Effective January 1st, 2013

Index 17500 Sheet 3

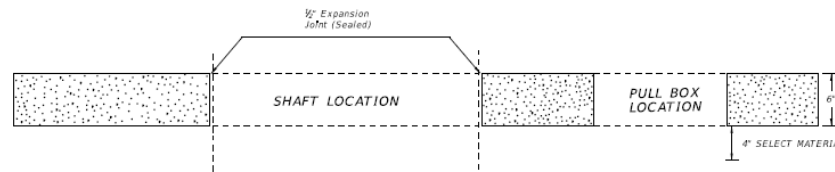
Metal Pole Wiring

NOTES:

1. Use compacted select material in accordance with Index 505.
2. Concrete shall be Class NS with a minimum strength at 28 days of $f'c=2.5$ ksi.
3. Outside edge of slab shall be cast against formwork.
4. The pull box shown is 13" x 24"; others approved under Section 633 of the Standard Specifications may be used.
5. Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around poles and pull boxes shall be included.
7. The expansion joint shall consist of $\frac{1}{2}$ " of closed-cell polyethylene foam expansion material. The top $\frac{1}{2}$ " of expansion material shall be removed after pouring the slab and sealed with a QPL approved Type A sealant meeting the requirements of Section 932.



SLAB DIMENSIONS



SECTION B-B

SLAB DETAILS
FOR POLE AND PULL BOX LOCATIONS

LAST REVISION 07/01/12	DESCRIPTION:	 FDOT DESIGN STANDARDS 2013	CONVENTIONAL LIGHTING	INDEX NO. 17500	SHEET NO. 3

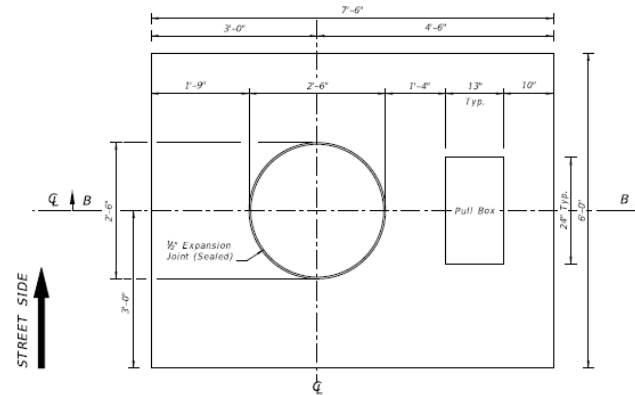
Effective January 1st, 2013

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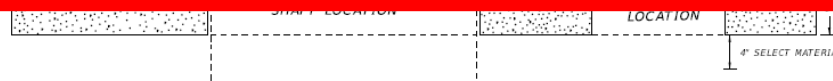
Metal Pole Wiring

NOTES:

1. Use compacted select material in accordance with Index 505.
2. Concrete shall be Class NS with a minimum strength at 28 days of $f'c=2.5$ ksi.
3. Outside edge of slab shall be cast against formwork.
4. The pull box shown is 13" x 24"; others approved under Section 633 of the Standard Specifications may be used.
5. Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around poles and pull boxes shall be included.
7. The expansion joint shall consist of $\frac{1}{2}$ " of closed-cell polyethelene foam expansion material. The top $\frac{1}{2}$ " of expansion material shall be removed after pouring the slab and sealed with a QPL approved Type A sealant meeting the requirements of Section 932.



7. The expansion joint shall consist of $\frac{1}{2}$ " of closed-cell polyethelene foam expansion material. The top $\frac{1}{2}$ " of expansion material shall be removed after pouring the slab and sealed with a QPL approved Type A sealant meeting the requirements of Section 932.



SLAB DETAILS
FOR POLE AND PULL BOX LOCATIONS

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FDOT DESIGN STANDARDS
2013

CONVENTIONAL LIGHTING

INDEX NO.	SHEET NO.
17500	3

Effective January 1st, 2013

Maintenance of Traffic Standards

Ezzeldin M. Benghuzzi, P.E

2013 Design Standards

Summary of Major Changes



DESIGN STANDARDS

FOR DESIGN, CONSTRUCTION, MAINTENANCE AND UTILITY
OPERATIONS ON THE STATE HIGHWAY SYSTEM

2013

TOPIC NO. 625-010-003

Approved For Use On Federal Aid Projects

J. Chris Ritter
For Martin Knopp, Division Administrator

State of Florida, Department of Transportation
Roadway Design Office
Mail Station 32
605 Suwannee Street
Tallahassee, Florida 32399-0450

Effective January 1, 2013

Index 600 Sheet 2

Sight Distance

DEFINITIONS

Regulatory Speed (In Work Zones)

The maximum permitted travel speed posted for the work zone is indicated by the regulatory speed limit signs. The work zone speed must be shown or noted in the plans. This speed should be used as the minimum design speed to determine runoff lengths, departure rates, flare rates, lengths of need, clear zone widths, taper lengths, crash cushion requirements, marker spacings, superelevation and other similar features.

Advisory Speed

The maximum recommended travel speed through a curve or a hazardous area.

Travel Way

The portion of the roadway for the movement of vehicles. For traffic control through work zones, travel way may include the temporary use of shoulders and any other permanent or temporary surface intended for use as a lane for the movement of vehicular traffic.

- Travel Lane:** The designated widths of roadway pavement marked to carry through traffic and to separate it from opposing traffic or traffic occupying other traffic lanes.
- Auxiliary Lane:** The designated widths of roadway pavement marked to separate speed change, turning, passing and climbing maneuvers from through traffic.

Detour, Lane Shift, and Diversion

A detour is the redirection of traffic onto another roadway to bypass the temporary traffic control zone. A lane shift is the redirection of traffic onto a different section of the permanent pavement. A diversion is the redirection of traffic onto a temporary roadway, usually adjacent to the permanent roadway and within the limits of the right of way.

Above Ground Hazard

An above ground hazard is any object, material or equipment other than traffic control devices that encroaches upon the travel way or that is located within the clear zone which does not meet the Department's safety criteria, i.e., anything that is greater than 4' in height and is 10m and unsighted or doesn't meet breakaway requirements.

TEMPORARY TRAFFIC CONTROL DEVICES

All temporary traffic control devices shall be on either the Department's Qualified Product List (QPL) or the Department's Approved Products List (APL). Ensure the appropriate QPL or APL number is permanently marked on the device in a readily visible location.

All temporary traffic control devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, temporary traffic control devices that are no longer appropriate shall be removed or covered.

Arrow Boards, Portable Changeable Message Signs, Radar Speed Display Trailer, Portable Regulatory Signs, and any other trailer mounted device shall be delineated with a temporary traffic control device placed at each corner when in use and shall be moved outside the travel way and clear zone or be shielded by a barrier or crash cushion when not in use.

PEDESTRIAN AND BICYCLIST

When an existing pedestrian way or bicycle way is located within a traffic control work zone, accommodation must be maintained and provision for the disabled must be provided.

Only approved temporary traffic control devices may be used to delineate a temporary traffic control zone pedestrian walkway.

Advanced notification of sidewalk closures and marked detours shall be provided by appropriate signs.

OVERHEAD WORK

Work is only allowed over a traffic lane when one of the following options is used:

OPTION 1 (OVERHEAD WORK USING A MODIFIED LANE CLOSURE)

Overhead work using a modified lane closure is allowed if all of the following conditions are met:

- Work operation is located in a signalized intersection and limited to signals, signs, lighting and utilities.
- Work operations are 60 minutes or less.
- Speed limit is 45 mph or less.
- Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- Aerial lift equipment is placed directly below the work area to close the lane.
- Traffic control devices are placed in advance of the vehicle/equipment closing the lane using a minimum 100 foot taper.
- Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.

OPTION 2 (OVERHEAD WORK ABOVE AN OPEN TRAFFIC LANE)

Overhead work above an open traffic lane is allowed if all of the following conditions are met:

- Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- Work operations are 60 minutes or less.
- Speed limit is 45 mph or less.
- No encroachment by any part of the work activities and equipment within an area bounded by 2 feet outside the edge of travel way and 18 feet high.
- Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.
- Other Governmental Agencies, Rail Facilities, or Codes may require a greater clearance. The greater clearance required prevails as the rule.

OPTION 3 (OVERHEAD WORK ADJACENT TO AN OPEN TRAFFIC LANE)

Overhead work adjacent to an open traffic lane is allowed if all of the following conditions are met:

- Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- Work operations are 1 day or less.
- Speed limit is 45 mph or less.
- No encroachment by any part of the work activities and equipment within 2 feet from the edge of travelway up to 18 feet high. Above 18' in height, no encroachment by any part of the work activities and equipment over the open traffic lane except as allowed in Option 2 for work operations of 60 minutes or less.
- Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.
- Other Governmental Agencies, Rail Facilities, or Codes may require a greater clearance. The greater clearance required prevails as the rule.

OVERHEAD WORK CONTINUED.

OVERHEAD WORK CONTINUED.

OPTION 4 (OVERHEAD WORK MAINTAINING TRAFFIC WITH NO ENCRoACHMENT BELOW THE OVERHEAD WORK AREA)

Traffic shall be detoured, shifted, diverted or paced as to not encroach in the area directly below the overhead work operations in accordance with the appropriate standard index drawing or detailed in the plans. This option applies to, but not limited to, the following construction activities:

- Beam, girder, segment, and bent/pier cap placement.
- Form and falsework placement and removal.
- Concrete placement.
- Railing construction located at edge of deck.
- Structure demolition.

OPTION 5 (CONDUCTOR/CABLE PULLING ABOVE AN OPEN TRAFFIC LANE)

Overhead cable and/or de-energized conductor installations initial pull to proper tension shall be done in accordance with the appropriate Standard Index or temporary traffic control plan.

Continuous pulling operations of secured cable and/or conductors are allowed over open lanes of traffic with no encroachment by any part of the work activities, materials or equipment within the minimal vertical clearance above the travel way. The utility shall take precautions to ensure that pull ropes and conductors/cables at no time fall below the minimum vertical clearance.

On Limited Access facilities, a site specific temporary traffic control plan is required. The temporary traffic control plan shall include:

- The temporary traffic control set up for the initial pulling of the pull rope across the roadway.
- During pulling operations, advance warning consisting of no less than a Changeable Message Sign upstream of the work area with alternating messages, "Overhead Work Ahead" and "Be Prepared to Stop" followed by a traffic control officer and police vehicle with blue lights flashing during the pulling operation.

RAILROADS

Railroad crossings affected by a construction project should be evaluated for traffic controls to reduce queuing on the tracks. The evaluation should include as a minimum: traffic volumes, distance from the tracks to the intersections, lane closure or taper locations, signal timing, etc.

SIGHT DISTANCE

Taper Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the view obstruction. The beginning of tapers should not be hidden behind curves.

Intersections: Traffic control devices at intersections must provide sight distances for the road user to perceive potential conflicts and to traverse the intersection safely. Construction equipment and materials shall not restrict Intersection sight distance.

ABOVE GROUND HAZARD

Above ground hazards (see definitions) are to be considered work areas during working hours and treated with appropriate work zone traffic control procedures. During nonworking hours, all objects, materials and equipment that constitute an above ground hazard must be stored/placed outside the travel way and clear zone or be shielded by a barrier or crash cushion.

For above ground hazards within a work zone the clear zone required should be based on the regulatory speed posted during construction.

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07/01/12	REVISION



FDOT DESIGN STANDARDS
2013

GENERAL INFORMATION FOR TRAFFIC
CONTROL THROUGH WORK ZONES

INDEX NO.	SHEET NO.
600	2

Effective January 1st, 2013

Ezzeldin Benghuzzi, P.E

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Sight Distance

SIGHT DISTANCE

Tapers: Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the view obstruction. The beginning of tapers should not be hidden behind curves.

Intersections: Traffic control devices at intersections must provide sight distances for the road user to perceive potential conflicts and to traverse the intersection safely. Construction equipment and materials shall not restrict intersection sight distance.

TEMPORARY TRAFFIC CONTROL DEVICES

All temporary traffic control devices shall be on either the Department's Qualified Product List (QPL) or the Department's Approved Products List (APL). Ensure the appropriate QPL or APL number is permanently marked on the device in a readily visible location.

All temporary traffic control devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, temporary traffic control devices that are no longer appropriate shall be removed or covered.

Arrow Boards, Portable Changeable Message Signs, Radar Speed Display Trailer, Portable Regulatory Signs, and any other trailer mounted device shall be delineated with a temporary traffic control device placed at each corner when in use and shall be moved outside the travel way and clear zone or be shielded by a barrier or crash cushion when not in use.

PEDESTRIAN AND BICYCLIST

When an existing pedestrian way or bicycle way is located within a traffic control work zone, accommodation must be maintained and provision for the disabled must be provided.

Only approved temporary traffic control devices may be used to delineate a temporary traffic control zone pedestrian walkway.

Advanced notification of sidewalk closures and marked detours shall be provided by appropriate signs.

OPTION 3 (OVERHEAD WORK ADJACENT TO AN OPEN TRAFFIC LANE)

Overhead work adjacent to an open traffic lane is allowed if all of the following conditions are met:

- Work operation is located on a utility pole, light pole, signal pole, or their appendages.
- Work operations are 1 day or less.
- Speed limit is 45 mph or less.
- No encroachment by any part of the work activities and equipment within 2 foot from the edge of travelway up to 18' height. Above 18' in height, no encroachment by any part of the work activities and equipment over the open traffic lane (except as allowed in Option 2 for work operations of 60 minutes or less).
- Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.
- Other Governmental Agencies, Rail facilities, or Codes may require a greater clearance. The greater clearance required prevails as the rule.

OVERHEAD WORK CONTINUED.

To be removed 50 feet from the tracks to the intersection, lane closure or taper locations, signal timing, etc.

SIGHT DISTANCE

Tapers: Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the view obstruction. The beginning of tapers should not be hidden behind curves.

Intersections: Traffic control devices at intersections must provide sight distances for the road user to perceive potential conflicts and to traverse the intersection safely. Construction equipment and materials shall not restrict intersection sight distance.

ABOVE GROUND HAZARD

Above ground hazards (see definitions) are to be considered work areas during working hours and treated with appropriate work zone traffic control procedures. During nonworking hours, all objects, materials and equipment that constitute an above ground hazard must be stored/placed outside the travel way and clear zone or be shielded by a barrier or crash cushion.

For above ground hazards within a work zone the clear zone required should be based on the regulatory speed posted during construction.

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GENERAL INFORMATION FOR TRAFFIC
CONTROL THROUGH WORK ZONES

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Effective January 1st, 2013

Ezzeldin Benghuzzi, P.E

Index 600 Sheet 3

High-Visibility Safety Apparel

CLEAR ZONE WIDTHS FOR WORK ZONES

The term 'clear zone' describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the traffic lane. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadside canals; where roadside canals are present, clear zone widths are to conform with the distances to canals as described in Volume 1, Chapter 4, Section 4.2 and Exhibit 4-A and 4-B of the Plans Preparation Manual.

CLEAR ZONE WIDTHS FOR WORK ZONES		
WORK ZONE SPEED (MPH)	TRAVEL LANES & MULTILANE RAMPS (feet)	AUXILIARY LANES & SINGLE LANE RAMPS (feet)
60-70	30	18
55	24	14
45-50	18	10
30-40	14	10
ALL SPEEDS CURB & GUTTER	# BEHIND FACE OF CURB	# BEHIND FACE OF CURB

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required superelevation applied to the design radii. Under conditions where normal crown controls curvature, the minimum radii that can be applied are listed in the table below.

MINIMUM RADII FOR NORMAL CROWN	
WORK ZONE POSTED SPEED	MINIMUM RADIUS
MPH	feet
65	2130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii is Used	

LENGTH OF LANE CLOSURES

Lane closures shall not exceed 2 miles in total length (taper, buffer space and work space) in any given direction on the Interstate or on state highways with a posted speed of 55 MPH or greater.

OVERWEIGHT/OVERSIZE VEHICLES

Restrictions to Lane Widths, Heights or Load Capacity can greatly impact the movement of over dimensioned loads. The Contractor shall notify the Engineer who in turn shall notify the State Permits Office, phone no. (850) 410-5777, at least seven calendar days in advance of implementing a maintenance of traffic plan which will impact the flow of overweight/oversize vehicles. Information provided shall include location, type of restriction (height, width or weight) and restriction time frames. When the roadway is restored to normal service the State Permits Office shall be notified immediately.

LANE WIDTHS

Lane widths of through roadways should be maintained through work zone travel ways wherever practical. The minimum widths for work zone travel lanes shall be as follows: 12' for Interstate with at least one 12' lane provided in each direction, unless formally excepted by the Federal Highway Administration 11' for freeways; and 10' for all other facilities.

HIGH-VISIBILITY SAFETY APPAREL

All high-visibility safety apparel shall meet the requirements of the International Safety Equipment Association (ISEA) and the American National Standards Institute (ANSI) for High-Visibility Safety Apparel, and labeled as ANSI/ISEA 107-2004 or 107-2010. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green as defined by the standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 1,000 feet. Class 3 apparel may be substituted for Class 2 apparel. Replace apparel that is not visible at 1,000 feet.

WORKERS: All workers within the right-of-way shall wear ANSI/ISEA Class 2 apparel. Workers operating machinery or equipment in which loose clothing could become entangled during operation shall wear fitted high-visibility safety apparel. Workers inside the bucket of a bucket truck are not required to wear high-visibility safety apparel.

UTILITIES: When other industry apparel safety standards require utility workers to wear apparel that is inconsistent with FDOT requirements such as NFPA, OSHA, ANSI, etc., the other standards for apparel may prevail.

FLAGGERS: For daytime activities, flaggers shall wear ANSI/ISEA Class 2 apparel. For nighttime activities, flaggers shall wear ANSI/ISEA Class 3 apparel.

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects must include specific regulatory speeds for each phase of work. This can either be the posted speed or a reduced speed. The speed shall be noted in the TCPs; this includes indicating the existing speed if no reduction is to be made. Regulatory speeds are to be uniformly established through each phase.

In general, the regulatory speed should be established to route vehicles safely through the work zone as close as to normal highway speed as possible. The regulatory speed should not be reduced more than 10 mph below the posted speed and never below the minimum statutory speed for the class of facility. When a speed reduction greater than 10 mph is imposed, the reduction is to be done in 10 mph per 500' increments.

Temporary regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. Once the work zone regulatory speeds are removed, the regulatory speed warning sign for construction will automatically go back into effect unless new speed limit signage is provided for in the plans.

On projects with interspaced work activities, speed reductions should be located in proximity to these activities which merit a reduced speed, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorist notice that normal speed can be resumed.

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 3 mile in rural areas (non-interstate) and on rural or urban interstates, additional regulatory speed signs are to be placed at no more than 1 mile intervals. Engineering judgement should be used in placement of the additional signs. Locating these signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 1000' apart.

When field conditions warrant speed reductions different from those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need, it will not be necessary for the DTOE to issue regulations for regulatory speeds in work zones due to the revised provisions of F.S. 316.0745(2) (b). Advisory Speed plates will be used at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. Advisory speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Plans Preparation Manual, Volume 1, Chapter 10.

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GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

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Effective January 1st, 2013

Ezzeldin Benghuzzi, P.E

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HIGH-VISIBILITY SAFETY APPAREL

All high-visibility safety apparel shall meet the requirements of the International Safety Equipment Association (ISEA) and the American National Standards Institute (ANSI) for High-Visibility Safety Apparel", and labeled as ANSI/ISEA 107-2004 or 107-2010. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green as defined by the standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 1,000 feet. Class 3 apparel may be substituted for Class 2 apparel. Replace apparel that is not visible at 1,000 feet.

30-40	24	10
ALL SPEEDS CURB & GUTTER	# BEHIND FACE OF CURB	# BEHIND FACE OF CURB

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required superelevation applied to the design radii. Under conditions where normal crown controls curvature, the minimum radii that can be applied are listed in the table below.

MINIMUM RADII FOR NORMAL CROWN	
WORK ZONE POSTED SPEED	MINIMUM RADIUS
MPH	feet
65	7130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii Is Used	

LENGTH OF LANE CLOSURES

Lane closures shall not exceed 2 miles in total length (taper, buffer space and work space) in any given direction on the Interstate or on state highways with a posted speed of 35 MPH or greater.

HIGH-VISIBILITY SAFETY APPAREL

All high-visibility safety apparel shall meet the requirements of the International Safety Equipment Association (ISEA) and the American National Standards Institute (ANSI) for High-Visibility Safety Apparel", and labeled as ANSI/ISEA 107-2004 or 107-2010. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green as defined by the standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 1,000 feet. Class 3 apparel may be substituted for Class 2 apparel. Replace apparel that is not visible at 1,000 feet.

WORKERS: All workers within the right-of-way shall wear ANSI/ISEA Class 2 apparel. Workers operating machinery or equipment in which loose clothing could become entangled during operation shall wear fitted high-visibility safety apparel. Workers inside the bucket of a bucket truck are not required to wear high-visibility safety apparel.

UTILITIES: When other industry apparel safety standards require utility workers to wear apparel that is inconsistent with FDOT requirements such as NFPA, OSHA, ANSI, etc., the other standards for apparel may prevail.

FLAGGERS: For daytime activities, flaggers shall wear ANSI/ISEA Class 2 apparel. For nighttime activities, flaggers shall wear ANSI/ISEA Class 3 apparel.

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 3 mile in rural areas (non-interstate) and on rural or urban interstates, additional regulatory speed signs are to be placed at no more than 1 mile intervals. Engineering judgement should be used in placement of the additional signs. Locating these signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 1000' apart.

When field conditions warrant speed reductions different from those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need, it will not be necessary for the DTOE to issue regulations for regulatory speeds in work zones due to the revised provisions of F.S. 316.0745(12) (b). Advisory Speed plates will be used at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. Advisory speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Plans Preparation Manual, Volume 1, Chapter 10.

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CONTROL THROUGH WORK ZONES

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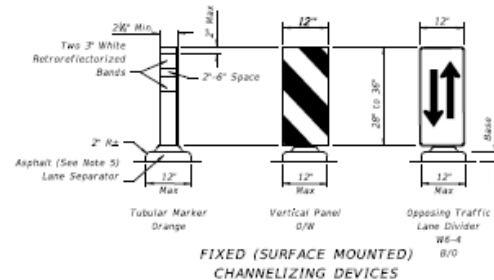
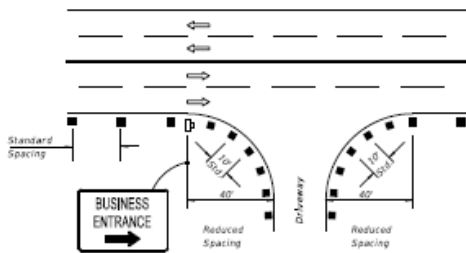
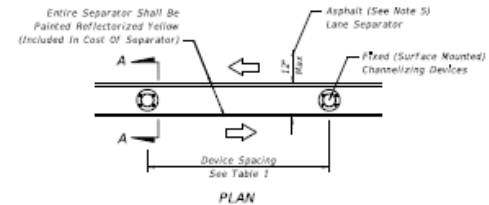
Ezzeldin Benghuzzi, P.E

Index 600 Sheet 11

Temporary Lane Separators

**Table 1
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft.)			
	Tubular Markers		Vertical Panels or Opposing Traffic Lane Dividers	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100



- For single business entrances, place one 24" x 36" business sign for each driveway entrance affected. Signs shall show specific business names. Logos may be provided by business owners. Standard BUSINESS ENTRANCE sign in Index 17355 may be used when approved by the Engineer.
- When several businesses share a common driveway entrance, place one 24" x 36" standard BUSINESS ENTRANCE sign according with Index 17355 at the common driveway entrance.
- Channelizing devices shall be placed at a reduced spacing on each side of the driveway entrance, but shall not restrict sight distance for the driveway users.
- Business entrance signs are intended to guide motorists to business entrances moved/modified or disturbed during construction projects. Business entrance signs are not required where there is minimal disruption to business driveways which is often the case with resurfacing type projects.

PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE

- Temporary lane separators shall be supplemented with any of the following approved fixed (surface mounted) channelizing devices: tubular markers, vertical panels, or opposing traffic lane divider panels. Opposing traffic lane divider panels (86-4) shall only be used as center lane dividers to separate opposing vehicular traffic on a two-lane, two-way operation. Tubular Markers, Vertical Panels and Opposing Traffic Lane Divider panels shall not be intermixed within the limits where the temporary lane separator is used. The connection between the channelizing device and the temporary lane separator curb shall hold the channelizing device in a vertical position.
- Retroreflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night. Furnish channelizing devices having retroreflective sheeting meeting the requirements of Section 390.
- 12" openings for drainage shall be constructed in the asphalt and portable temporary lane separator at a maximum spacing of 25' in areas with grades of 1% or less or 50' in areas with grades over 1% as directed by the Engineer.
- Tapered ends shall be used at the beginning and end of each run of the temporary lane separator to form a gradual increase in height from the pavement level to the top of the temporary lane separator.
- The Contractor has the option of using portable temporary lane separators containing fixed channelizing devices in lieu of the temporary asphalt separator and channelizing devices detailed on this sheet. The portable temporary lane separator shall come in portable sections that can be connected to maintain continuous alignment between the separate curb sections. Each temporary lane separator section shall be 36 inches to 48 inches in total length. Portable temporary lane separators shall duplicate the color of the pavement marking. Portable temporary lane separators shall be one of those listed on the Qualified Products List.
- Any damage to existing pavement caused by the removal of temporary lane separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.

TEMPORARY LANE SEPARATOR

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Effective January 1st, 2013

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Temporary Lane Separators

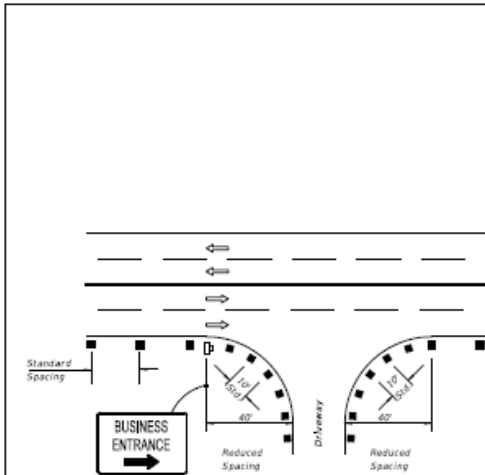
- 1. Temporary lane separators shall be supplemented with any of the following approved fixed (surface mounted) channelizing devices: tubular markers, vertical panels, or opposing traffic lane divider panels. Opposing traffic lane divider panels (W6-4) shall only be used as center lane dividers to separate opposing vehicular traffic on a two-lane, two-way operation. Tubular Markers, Vertical Panels and Opposing Traffic Lane Divider panels shall not be intermixed within the limits where the temporary lane separator is used. The connection between the channelizing device and the temporary lane separator curb shall hold the channelizing device in a vertical position.*
- 2. Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night. Furnish channelizing devices having retroreflective sheeting meeting the requirements of Section 990.*
- 3. 12" openings for drainage shall be constructed in the asphalt and portable temporary lane separator at a maximum spacing of 25' in areas with grades of 1% or less or 50' in areas with grades over 1% as directed by the Engineer.*
- 4. Tapered ends shall be used at the beginning and end of each run of the temporary lane separator to form a gradual increase in height from the pavement level to the top of the temporary lane separator.*
- 5. The Contractor has the option of using portable temporary lane separators containing fixed channelizing devices in lieu of the temporary asphalt separator and channelizing devices detailed on this sheet. The portable temporary lane separator shall come in portable sections that can be connected to maintain continuous alignment between the separate curb sections. Each temporary lane separator section shall be 36 inches to 48 inches in total length. Portable temporary lane separators shall duplicate the color of the pavement marking. Portable temporary lane separators shall be one of those listed on the Qualified Products List.*
- 6. Any damage to existing pavement caused by the removal of temporary lane separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.*

TEMPORARY LANE SEPARATOR

Effective January 1st ,2013

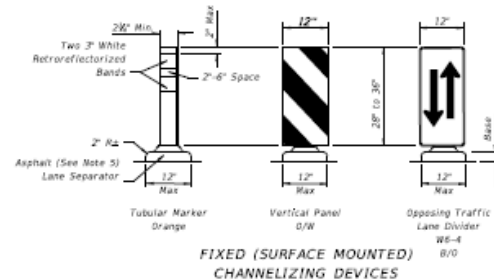
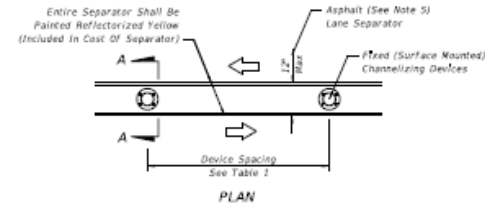
Index 600 Sheet 11

Business Entrance Signs



**Table 1
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft.)			
	Tubular Markers		Vertical Panels or Opposing Traffic Lane Dividers	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100



**FIXED (SURFACE MOUNTED)
CHANNELIZING DEVICES**

SECTION AA

- For single business entrances, place one 24" x 36" business sign for each driveway entrance affected. Signs shall show specific business names. Logos may be provided by business owners. Standard BUSINESS ENTRANCE sign in Index 17355 may be used when approved by the Engineer.
- When several businesses share a common driveway entrance, place one 24" x 36" standard BUSINESS ENTRANCE sign according with Index 17355 at the common driveway entrance.
- Channelizing devices shall be placed at a reduced spacing on each side of the driveway entrance, but shall not restrict sight distance for the driveway users.
- Business entrance signs are intended to guide motorists to business entrances moved/modified or disturbed during construction projects. Business entrance signs are not required where there is minimal disruption to business driveways which is often the case with resurfacing type projects.

PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE

- Temporary lane separators shall be supplemented with any of the following approved fixed (surface mounted) channelizing devices: tubular markers, vertical panels, or opposing traffic lane divider panels. Opposing traffic lane divider panels (86-4) shall only be used as center lane dividers to separate opposing vehicular traffic on a two-lane, two-way operation. Tubular Markers, Vertical Panels and Opposing Traffic Lane Divider panels shall not be intermixed within the limits where the temporary lane separator is used. The connection between the channelizing device and the temporary lane separator curb shall hold the channelizing device in a vertical position.
- Retrified materials shall have a smooth sealed outer surface which will display the same approximate color day and night. Furnish channelizing devices having retroreflective sheeting meeting the requirements of Section 390.
- 12" openings for drainage shall be constructed in the asphalt and portable temporary lane separator at a maximum spacing of 25' in areas with grades of 1% or less or 50' in areas with grades over 1% as directed by the Engineer.
- Tapered ends shall be used at the beginning and end of each run of the temporary lane separator to form a gradual increase in height from the pavement level to the top of the temporary lane separator.
- The Contractor has the option of using portable temporary lane separators containing fixed channelizing devices in lieu of the temporary asphalt separator and channelizing devices detailed on this sheet. The portable temporary lane separator shall come in portable sections that can be connected to maintain continuous alignment between the separate curb sections. Each temporary lane separator section shall be 36 inches in total length. Portable temporary lane separators shall duplicate the color of the pavement marking. Portable temporary lane separators shall be one of those listed on the Qualified Products List.
- Any damage to existing pavement caused by the removal of temporary lane separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.

TEMPORARY LANE SEPARATOR

LAST REVISION 07/01/12	DESCRIPTION	FDOT DESIGN STANDARDS 2013	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX NO. 600	SHEET NO. 11

Effective January 1st, 2013

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Index 600 Sheet 11

Business Entrance Signs

- 1. For single business entrances, place one 24" x 36" business sign for each driveway entrance affected. Signs shall show specific business names. Logos may be provided by business owners. Standard BUSINESS ENTRANCE sign in Index 17355 may be used when approved by the Engineer.*
- 2. When several businesses share a common driveway entrance, place one 24" x 36" standard BUSINESS ENTRANCE sign according with Index 17355 at the common driveway entrance.*
- 3. Channelizing devices shall be placed at a reduced spacing on each side of the driveway entrance, but shall not restrict sight distance for the driveway users.*
- 4. Business entrance signs are intended to guide motorist to business entrances moved/modified or disturbed during construction projects. Business entrance signs are not required where there is minimal disruption to business driveways which is often the case with resurfacing type projects.*

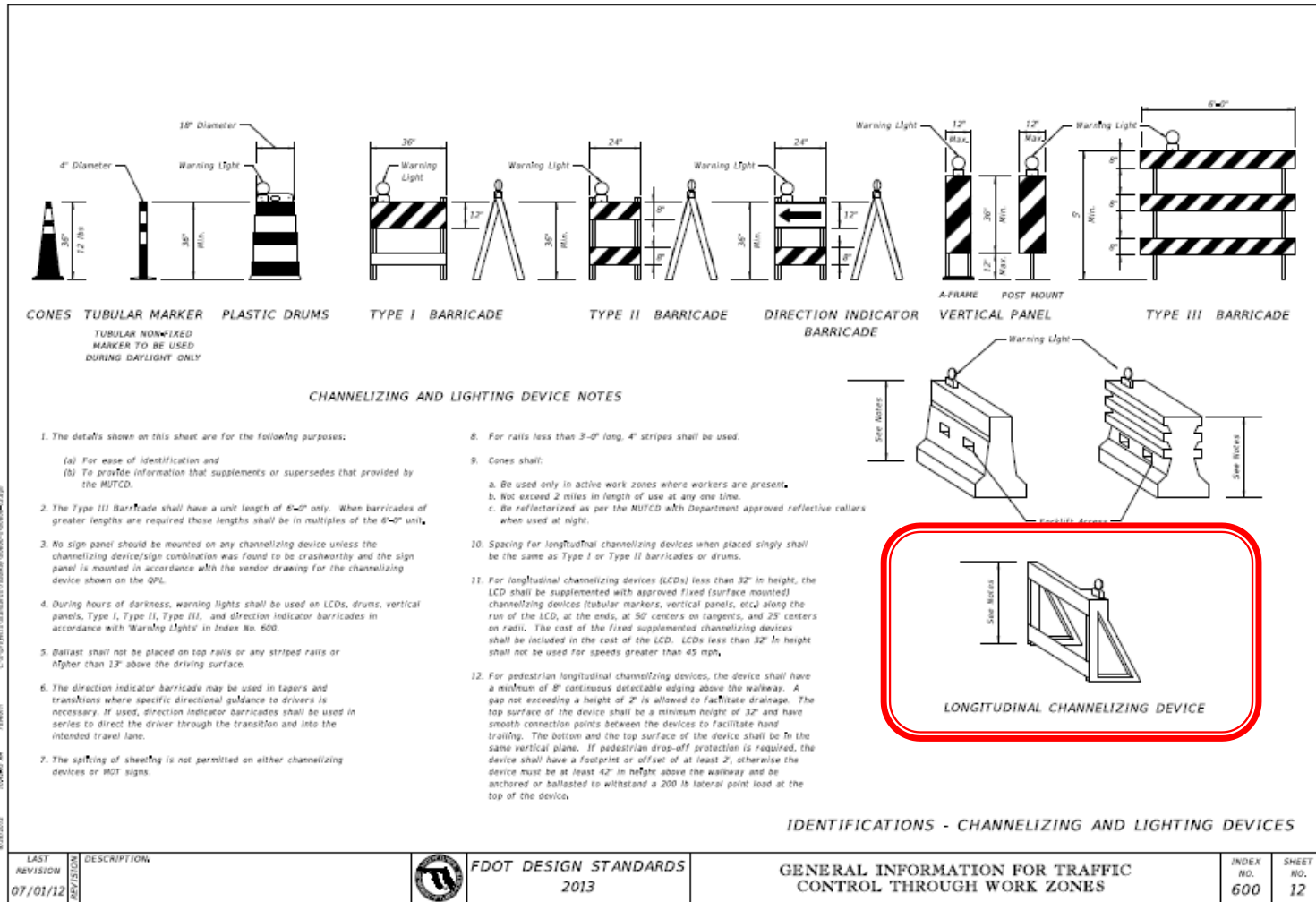
**PLACEMENT OF BUSINESS ENTRANCE SIGNS AND
CHANNELIZING DEVICES AT BUSINESS ENTRANCE**

Effective January 1st ,2013

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Index 600 Sheet 12

Longitudinal Channelizing Device

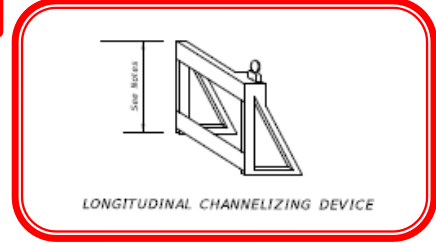
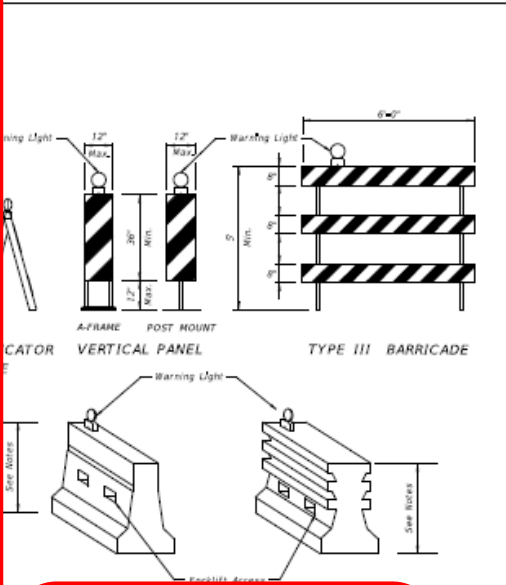
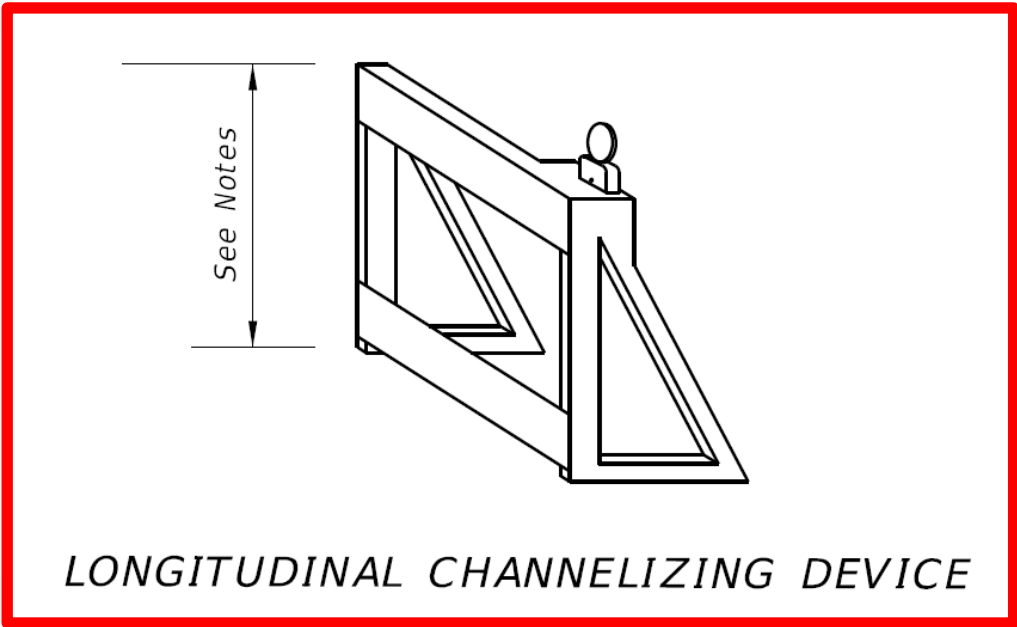


Effective January 1st, 2013

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Index 600 Sheet 12

Longitudinal Channelizing Device



- panel is mounted in accordance with the vendor drawing for the channelizing device shown on the QPL.
- During hours of darkness, warning lights shall be used on LCDs, drums, vertical panels, Type I, Type II, Type III, and direction indicator barricades in accordance with 'Warning Lights' in Index No. 600.
 - Ballast shall not be placed on top rails or any striped rails or heighter than 12" above the driving surface.
 - The direction indicator barricade may be used in tapers and transitions where specific directional guidance to drivers is necessary. If used, direction indicator barricades shall be used in series to direct the driver through the transition and into the intended travel lane.
 - The spacing of sheeting is not permitted on either channelizing devices or MOT signs.
 - For longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.
 - For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8" continuous detachable edging along the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 12" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES

LAST REVISION 07/01/12	DESCRIPTION		FDOT DESIGN STANDARDS 2013	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX NO. 600	SHEET NO. 12
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Effective January 1st, 2013

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Index 600 Sheet 12

Longitudinal Channelizing Devices (LCD)

Pedestrian Longitudinal Channelizing Devices



Index 600 Sheet 12

Longitudinal Channelizing Devices (LCD)

Pedestrian Longitudinal Channelizing Devices



Index 600 Sheet 12

Longitudinal Channelizing Device

CONES
4" Diameter
36" Hgt
12" Dia

TUBULAR MARKER
18" Diameter
Warning Light
38" Min.
TUBULAR NON-FIXED MARKER TO BE USED DURING DAYLIGHT ONLY

PLASTIC DRUMS

TYPE I BARRICADE
36" Hgt
Warning Light
12" Dia
38" Min.

TYPE II BARRICADE
24" Hgt
Warning Light
12" Dia
38" Min.

DIRECTION INDICATOR BARRICADE
24" Hgt
Warning Light
12" Dia
38" Min.

VERTICAL PANEL
Warning Light
12" Max.
12" Min.
38" Min.

TYPE III BARRICADE
6'0" Hgt
Warning Light
12" Max.
38" Min.

CHANNELIZING AND LIGHTING DEVICE NOTES

- The details shown on this sheet are for the following purposes:
 - For ease of identification and
 - To provide information that supplements or supersedes that provided by the MUTCD.
- The Type III Barricade shall have a unit length of 6'-0" only. When barricades of greater lengths are required those lengths shall be in multiples of the 6'-0" unit.
- No sign panel should be mounted on any channelizing device unless the channelizing device/sign combination was found to be crashworthy and the sign panel is mounted in accordance with the vendor drawing for the channelizing device shown on the QPL.
- During hours of darkness, warning lights shall be used on LCDs, drums, vertical panels, Type I, Type II, Type III, and direction indicator barricades in accordance with 'Warning Lights' in Index No. 600.
- Ballast shall not be placed on top rails or any striped rails or higher than 12" above the driving surface.
- The direction indicator barricade may be used in tapers and transitions where specific directional guidance to drivers is necessary. If used, direction indicator barricades shall be used in series to direct the driver through the transition and into the intended travel lane.
- The spacing of sheeting is not permitted on either channelizing devices or MUT signs.
- For rails less than 3'-0" long, 4" stripes shall be used.
- Cones shall:
 - Be used only in active work zones where workers are present.
 - Not exceed 2 miles in length of use at any one time.
 - Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.
- Spacing for longitudinal channelizing devices when placed singly shall be the same as Type I or Type II barricades or drums.
- For longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.
- For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8" continuous detachable edging along the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 12" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES

LAST REVISION	DESCRIPTION	FDOT DESIGN STANDARDS	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX NO.	SHEET NO.
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Index 600 Sheet 12

Longitudinal Channelizing Device

11. For longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.

CHANNELIZING AND LIGHTING DEVICE NOTES

1. The details shown on this sheet are for the following purposes:

- (a) For ease of identification and
- (b) To provide information that supplements or supersedes that provided by the MUTCD.

2. The Type III Barricade shall have a unit length of 6'-0" only. When barricades of greater lengths are required those lengths shall be in multiples of the 6'-0" unit.

3. No sign panel should be mounted on any channelizing device unless the channelizing device/sign combination was found to be crashworthy and the sign panel is mounted in accordance with the vendor drawing for the channelizing device shown on the QPL.

4. During hours of darkness, warning lights shall be used on LCDs, drums, vertical panels, Type I, Type II, Type III, and direction indicator barricades in accordance with 'Warning Lights' in Index No. 600.

5. Ballast shall not be placed on top rails or any striped rails or higher than 13" above the driving surface.

6. The direction indicator barricade may be used in tapers and transitions where specific directional guidance to drivers is necessary. If used, direction indicator barricades shall be used in series to direct the driver through the transition and into the intended travel lane.

7. The splicing of sheeting is not permitted on either channelizing devices or MUT signs.

8. For rails less than 3'-0" long, 4" stripes shall be used.

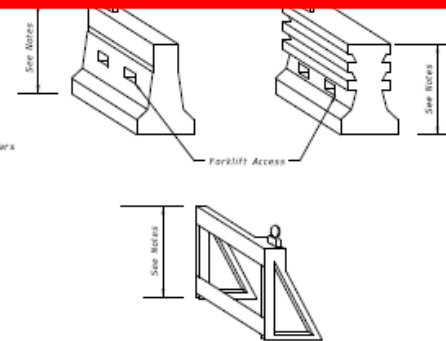
9. Cones shall:

- a. Be used only in active work zones where workers are present.
- b. Not exceed 2 miles in length of use at any one time.
- c. Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.

10. Spacing for longitudinal channelizing devices when placed singly shall be the same as Type I or Type II barricades or drums.

11. For longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.

12. For pedestrian longitudinal channelizing devices, the device shall have a minimum of 4" continuous detachable edging along the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 12" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.



LONGITUDINAL CHANNELIZING DEVICE

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES

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Index 600 Sheet 12

Longitudinal Channelizing Devices (LCD)

Vehicle Longitudinal Channelizing Devices



Index 600 Sheet 12

Longitudinal Channelizing Device

CONES
4" Diameter
36" Hgt
12" Dia

TUBULAR MARKER
18" Diameter
Warning Light
38" Min.
TUBULAR NON-FIXED MARKER TO BE USED DURING DAYLIGHT ONLY

PLASTIC DRUMS

TYPE I BARRICADE
36" Hgt
Warning Light
12" Dia
38" Min.

TYPE II BARRICADE
24" Hgt
Warning Light
12" Dia
38" Min.

DIRECTION INDICATOR BARRICADE
24" Hgt
Warning Light
12" Dia
38" Min.

VERTICAL PANEL
Warning Light
12" Max.
12" Min.
38" Min.
12" Max.

TYPE III BARRICADE
6' Hgt
Warning Light
12" Max.
38" Min.

CHANNELIZING AND LIGHTING DEVICE NOTES

- The details shown on this sheet are for the following purposes:
 - For ease of identification and
 - To provide information that supplements or supersedes that provided by the MUTCD.
- The Type III Barricade shall have a unit length of 6'-0" only. When barricades of greater lengths are required those lengths shall be in multiples of the 6'-0" unit.
- No sign panel should be mounted on any channelizing device unless the channelizing device/sign combination was found to be crashworthy and the sign panel is mounted in accordance with the vendor drawing for the channelizing device shown on the QPL.
- During hours of darkness, warning lights shall be used on LCDs, drums, vertical panels, Type I, Type II, Type III, and direction indicator barricades in accordance with 'Warning Lights' in Index No. 600.
- Ballast shall not be placed on top rails or any striped rails or higher than 12" above the driving surface.
- The direction indicator barricade may be used in tapers and transitions where specific directional guidance to drivers is necessary. If used, direction indicator barricades shall be used in series to direct the driver through the transition and into the intended travel lane.
- The spacing of sheeting is not permitted on either channelizing devices or MUT signs.
- For rails less than 3'-0" long, 4" stripes shall be used.
- Cones shall:
 - Be used only in active work zones where workers are present.
 - Not exceed 2 miles in length of use at any one time.
 - Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.
- Spacing for longitudinal channelizing devices when placed singly shall be the same as Type I or Type II barricades or drums.
- For longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.
- For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8" continuous detachable edging along the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 12" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the roadway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES

LAST REVISION	DESCRIPTION	FDOT DESIGN STANDARDS	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX NO.	SHEET NO.
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Index 600 Sheet 12

Longitudinal Channelizing Device

12. For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8" continuous detectable edging above the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 32" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.

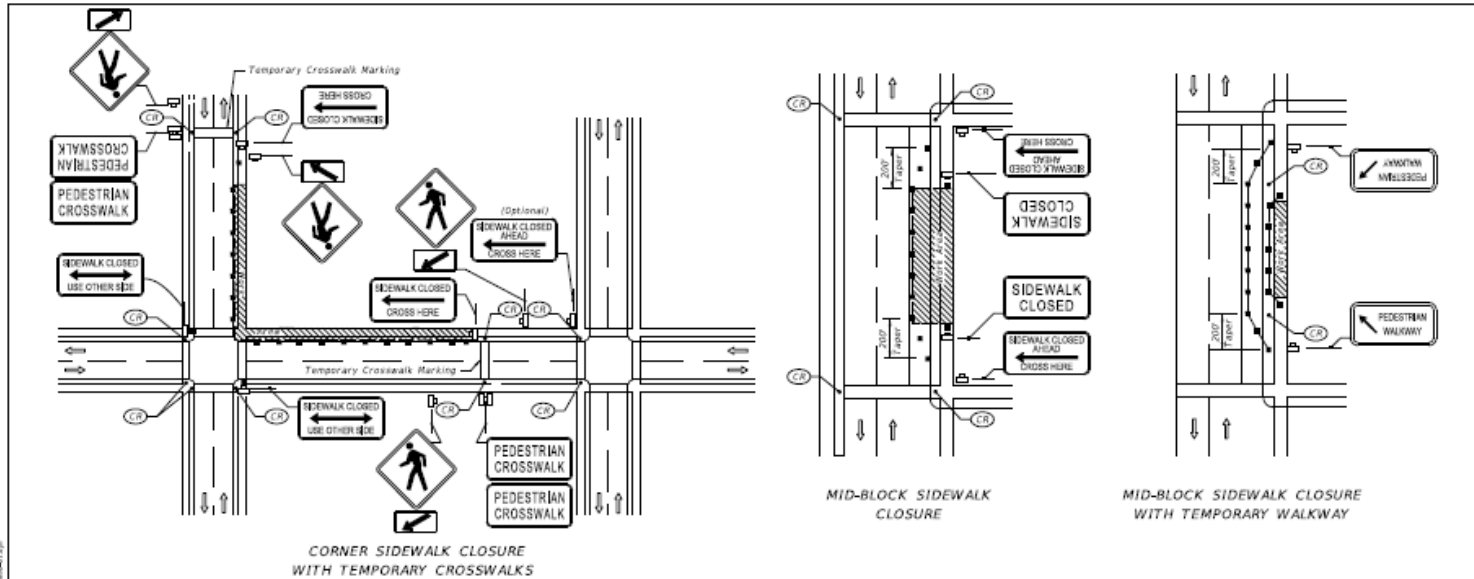
<p>device shown on the QPL.</p> <p>4. During hours of darkness, warning lights shall be used on LCDs, drums, vertical panels, Type I, Type II, Type III, and direction indicator barricades in accordance with 'Warning Lights' in Index No. 600.</p> <p>5. Ballast shall not be placed on top rails or any striped rails or higher than 12" above the driving surface.</p> <p>6. The direction indicator barricade may be used in tapers and transitions where specific directional guidance to drivers is necessary. If used, direction indicator barricades shall be used in series to direct the driver through the transition and into the intended travel lane.</p> <p>7. The splicing of sheeting is not permitted on either channelizing devices or MOT signs.</p>		<p>11. For longitudinal channelizing devices (LCDs) less than 32' in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32' in height shall not be used for speeds greater than 45 mph.</p>	 <p>LONGITUDINAL CHANNELIZING DEVICE</p>								
<p>12. For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8" continuous detectable edging above the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 32" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.</p>											
IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES											
<table border="1"> <tr> <th>LAST REVISION</th> <th>DESCRIPTION</th> </tr> <tr> <td>07/01/12</td> <td>REVISION</td> </tr> </table>	LAST REVISION	DESCRIPTION	07/01/12	REVISION	 <p>FDOT DESIGN STANDARDS 2013</p>	<p>GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES</p>	<table border="1"> <tr> <th>INDEX NO.</th> <th>SHEET NO.</th> </tr> <tr> <td>600</td> <td>12</td> </tr> </table>	INDEX NO.	SHEET NO.	600	12
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Index 660 Sheet 1

Longitudinal Channelizing Device



GENERAL NOTES

- Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
- For spacing of traffic control devices and general TCZ requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25.
- Street lighting should be considered.
- For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.
- Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
- Post Mounted Signs located near or adjacent to a sidewalk shall have a 7' minimum clearance from the bottom of sign to the sidewalk.
- When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
- In the event that sidewalks on both sides of the street are closed, pedestrians shall be guided around the construction zone.
- Temporary walkways shall be a minimum of 4' wide with a maximum 0.02 cross slope and a maximum 0.05 running slope between ramps. Temporary walkways less than 5' in width shall provide for a 3' x 5' passing space at intervals not to exceed 200'. Temporary ramps shall meet the requirements for curb ramps specified in Index No. 304. Temporary walkway surfaces and ramps shall be stable, firm, slip resistant, and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc.
- Temporary ramps and temporary crosswalk markings shall be removed with reopening of the sidewalk, unless otherwise noted in the plans. All work and materials associated with constructing temporary curb ramps and temporary crosswalk markings, removal and disposal of temporary curb ramps and temporary crosswalk markings, and restoration to original condition shall be paid for as Maintenance of Traffic, Lump Sum.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCRoACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Required Locations For Either Temporary or Permanent Curb Ramps
- Lane Identification + Direction of Traffic
- Pedestrian Longitudinal Channelizing Device

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Index 660 Sheet 1

Longitudinal Channelizing Device

SYMBOLS

- Work Area
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Required Locations For Either Temporary Or Permanent Curb Ramps.
- Lane Identification + Direction of Traffic
- Pedestrian Longitudinal Channelizing Device

requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25'.

3. Street lighting should be considered.

4. For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.

5. Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.

6. Post Mounted Signs located near or adjacent to a sidewalk shall have a 2' minimum clearance from the bottom of sign to the sidewalk.

8. In the event that sidewalks on both sides of the street are closed, pedestrians shall be guided around the construction zone.

9. Temporary walkways shall be a minimum of 4' wide with a maximum 0.02 cross slope and a maximum 0.05 running slope between ramps. Temporary walkways less than 5' in width shall provide for a 3' x 5' passing space at intervals not to exceed 200'. Temporary ramps shall meet the requirements for curb ramps specified in Index No. 304. Temporary walkway surfaces and ramps shall be stable, firm, slip resistant, and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc.

10. Temporary ramps and temporary crosswalk markings shall be removed with reopening of the sidewalk, unless otherwise noted in the plans. All work and materials associated with constructing temporary curb ramps and temporary crosswalk markings, removal and disposal of temporary curb ramps and temporary crosswalk markings, and restoration to original condition shall be paid for as Maintenance of Traffic, Lump Sum.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCRUSCH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES.

LAST REVISION	DESCRIPTION	FDOT DESIGN STANDARDS 2013	PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS	INDEX NO.	SHEET NO.
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Index 660 Sheet 1

Longitudinal Channelizing Device

CORNER SIDEWALK CLOSURE WITH TEMPORARY CROSSWALKS

MID-BLOCK SIDEWALK CLOSURE

MID-BLOCK SIDEWALK CLOSURE WITH TEMPORARY WALKWAY

GENERAL NOTES

- Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
- For spacing of traffic control devices and general TCZ requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25.
- Street lighting should be considered.
- For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.
- Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
- Post Mounted Signs located near or adjacent to a sidewalk shall have a 2' minimum clearance from the bottom of sign to the sidewalk.
- When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
- In the event that sidewalks on both sides of the street are closed, pedestrians shall be guided around the construction zone.
- Temporary walkways shall be a minimum of 4' wide with a maximum 0.02 cross slope and a maximum 0.05 running slope between ramps. Temporary walkways less than 5' in width shall provide for a 3' x 5' passing space at intervals not to exceed 200'. Temporary ramps shall meet the requirements for curb ramps specified in Index No. 304. Temporary walkway surfaces and ramps shall be stable, firm, slip resistant, and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc.
- Temporary ramps and temporary crosswalk markings shall be removed with reopening of the sidewalk, unless otherwise noted in the plans. All work and materials associated with constructing temporary curb ramps and temporary crosswalk markings, removal and disposal of temporary curb ramps and temporary crosswalk markings, and restoration to original condition shall be paid for as Maintenance of Traffic, Lump Sum.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCRoACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Required Locations For Either Temporary Or Permanent Curb Ramps
- Lane Identification + Direction of Traffic
- Pedestrian Longitudinal Channelizing Device

LAST REVISION 07/01/12	DESCRIPTION	FDOT DESIGN STANDARDS 2013	PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS	INDEX NO. 660	SHEET NO. 1
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Effective January 1st, 2013

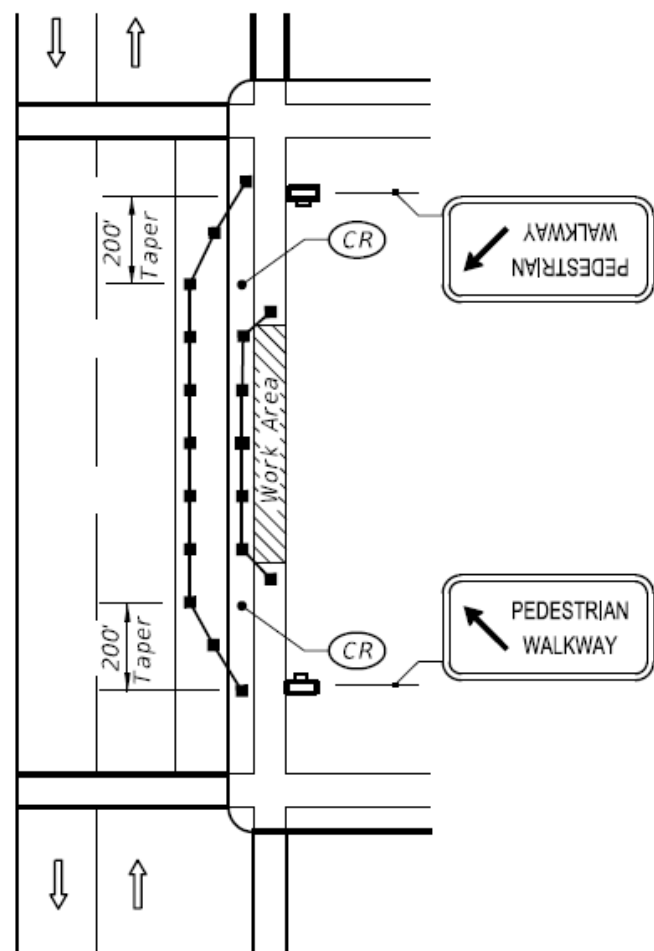
Index 660 Sheet 1

Device

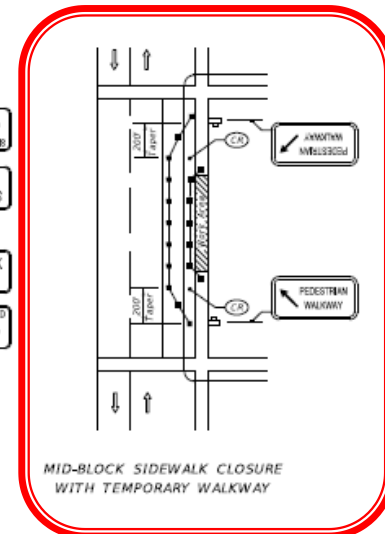
SYMBOLS

- Work Area
- Channelizing Device
- Work Zone Sign
- Required Locations Or Permanent Curb
- Lane Identification
- Pedestrian Longitudinal

LAST REVISION	DATE	DESCRIPTION
07/01/12		



MID-BLOCK SIDEWALK CLOSURE WITH TEMPORARY WALKWAY



MID-BLOCK SIDEWALK CLOSURE WITH TEMPORARY WALKWAY

... of the street,
both sidewalks are not
... are closed, pedestrians
... a maximum 0.02 cross
Temporary walkways
space at intervals not
ments for curb ramps
and ramps shall be
signs and hazards such
serials, etc.
... if be removed with
plans. All work and
signs and temporary
curb ramps and
if condition shall be

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT
WORKERS OR THEIR ACTIVITIES
ENCROACH ON THE SIDEWALK FOR A
PERIOD OF MORE THAN 60 MINUTES.

FOR CLOSURE OF SIDEWALKS

INDEX NO.	SHEET NO.
660	1

Design Bulletin 12-13

Crash Cushions



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

ROADWAY DESIGN BULLETIN 12-13
DCE MEMORANDUM 22-12
(FHWA Approved: 7/13/12)

DATE: July 17, 2012

TO: District Design Engineers, District Construction Engineers, Plans Preparation Manual Holders

FROM: Duane Brautigam, P.E., Director, Office of Design
David A. Sadler, P.E., Director, Office of Construction

CC: Brian Blanchard, Tom Byron, Tim Lattner, Rudy Powell, Greg Davis

SUBJECT: PERMANENT AND TEMPORARY CRASH CUSHION SELECTION

BACKGROUND:

Crash cushions are used to protect motorists from the exposed ends of barriers, fixed objects and other hazards within the clear zone. Crash cushions in work zones may be used in the same manner as permanent crash cushion installations. Crash cushions are approved for use on Department contracts and are listed on the Qualified Products List (QPL) under two sections. Temporary crash cushions are listed under Section 102 and permanent crash cushions are listed under Section 544.

Currently, our method for selecting permanent and temporary crash cushions is based on design speed or the work zone speed. NCHRP (National Cooperative Highway Research Program) Report 350 and MASH (Manual for Assessing Safety Hardware) 09 provide two test matrices which we use to evaluate crash cushions, Test Level 2 (TL-2) and Test Level 3 (TL-3). The impact speed used for the TL-2 matrix is 70 kph (43.5 mph) and for the TL-3 matrix is 100 kph (62.1 mph). The Federal Highway Administration Office of Safety considers that a TL-3 accepted crash cushion is sufficient for speeds greater than 60 mph.

Recently, the Department has required manufacturers to modify their vendor drawings, based on the FHWA guidance for both temporary and permanent crash cushions to specify whether the crash cushions are TL-2 or TL-3. TL-2 crash cushions are required on low speed facilities (45 mph or less). TL-3 crash cushions are required on high speed facilities (50 mph or greater). Certain crash cushion products posted on the Department's QPL website allow for extrapolation below 45 mph, interpolation between 45mph and 60mph, and extrapolation above 60 mph.

www.dot.state.fl.us

Effective January 1st, 2013

Design Bulletin 12-13

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Effective January 1st ,2013

Temporary Crash Cushions

FDOT Criteria

- **VENDOR DRAWINGS**
 - TL-2 (45 mph or less)
 - TL-3 (50 mph or greater)

- **SPEEDS**
 - Interpolating at 5 mph increments
 - Extrapolating for speeds above 60 mph is no longer allowed (FHWA Recommendation)

Effective January 1st ,2013

Temporary Crash Cushions

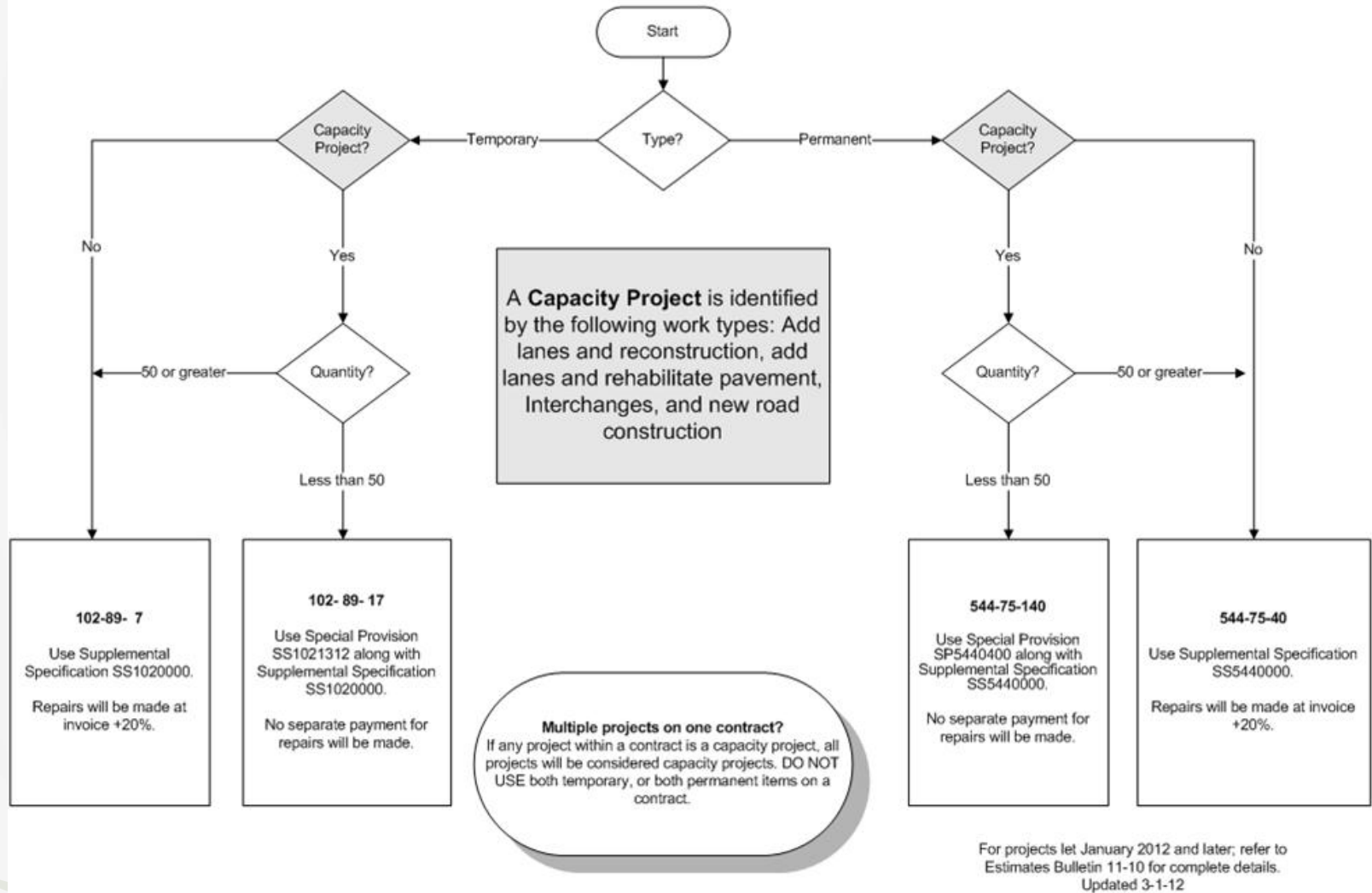
Plans

Summary of Temporary Crash Cushions							
MOT Phase	Station	Offset (feet)	Side	Work Zone Speed (mph)	Test Level (TL-2 or TL-3)	Width of hazard (inches)	Length Restrictions (feet)
Phase 1	122+90	16	Rt.	55	TL-3	24 inch	N/A
Phase 2	145+27	16	Lt.	45	TL-2	48 inch	14

Effective January 1st ,2013

Temporary Crash Cushions

Crash Cushion Pay Item Selection



Effective January 1st ,2013

Contact for more information

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 - ▶ Stefanie D. Maxwell, P.E.
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