TRAFFIC OPERATIONS STANDARDS

JANUARY 1982
### Standard Symbols for Plan Sheets

#### Traffic Signals Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>![Symbol]</td>
<td>Existing Pole &amp; Luminare</td>
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<td>Rigid Galvanized Lighting Conduit and Conductors</td>
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<td>Under Deck Lighting Fixture</td>
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#### Lighting Symbols

- New Pole & Luminare
- Existing Pole & Luminare
- Existing Pole & Luminare to Be Removed
- Final Position of Relocated or Adjusted Pole & Luminare
- New High Mast Lighting Tower
- City or Utility Owned Luminare & Pole
- PVC (Polyvinyl Chloride) Lighting Conduit and Conductors
- Rigid Galvanized Lighting Conduit and Conductors
- Concrete Lighting Pull-Box
- Waterproof Lighting Pull-Box
- Lighting Distribution Point
- New Joint Use Pole
- Existing Use Pole
- Under Deck Lighting Fixture

#### Signing and Pavement Marking Symbols

- Pavement Arrow
- Single Solid Line
- Double Solid Line
- Skip Line
- Stop Bar
- Traffic Sign (Post Mounted)
- Traffic Sign (Overhead)
- Sign Number
- Sign Item Number
- Traffic Flow Arrow
1. Ground resistors shall have a resistance to ground not to exceed 25 ohms, where the resistance is 50 ohms or less, 2. Ground resistors may be used with ground resistors, parallel or in series. Conductors shall be of Type UF-B or UF, or of equivalent materials suitable for the service to be performed. Insulated wires shall not be used. Type UF-B shall be used, when and only when, the installation is protected against incendiary devices by an approved circuit protector. Insulated wires shall not be used. Type UF-B shall be used, when and only when, the installation is protected against incendiary devices by an approved circuit protector.

2. The contractor shall be responsible for connecting all utility companies prior to any underground work. The utility company will locate and identify their facilities.

3. The contractor shall determine the service required date for the power company transformer installation at the pre-construction conference.

4. The power company reserves the right to install the new, switchgear, and wiring at the power company poles at the expense of the contractor. The power company will provide the necessary materials at the expense of the contractor. Additional work may be required for an alternate procedure.

5. Any damaged portions of backfilled steel poles and bracket arms shall be replaced in accordance with section 54.6 of the standard specifications.

6. Poles, bracket arms, and armature devices shall be designed in accordance with the design criteria, as indicated in the plans.

7. The luminaire manufacturer shall place a permanent tag on the luminaire indicating its location, the luminaire's position, and the luminaire's position. The tag shall be clearly visible and legible.

8. Before final acceptance, the contractor shall provide 2 sets of all drawings to the power company for review.

9. Conduit routing shall be pole to pole. Mainline conduit shall be set back from the edge of the road by a distance not to exceed 10 feet. Any cable routing in locations where conductors are required to be set back shall be 12" O.D. in front of the standard guardrail position.

10. Pole positions and conduit routing may be adjusted, as approved by the engineer, to prevent conflicts with utility and drainage structures not indicated, and prevent guardrail, pole conflict with underground lighting circuit.

11. Where guardrail is constructed, the poles shall be placed a minimum of 4 feet from the guardrail.

12. Pole foundation installations shall be backfilled and compacted. The pole shall be in a firm, stable condition, approximately equal to that of the adjacent soil. The pole shall conform to existing grade and fully sodded.

13. The wires at the pole handhole and full boxes shall be looped up in the pole and full boxes with sufficient wire strength. All cable splices shall be made inside the handhole and full boxes, with splice boxes being used. All splice connections shall be made with splice boxes. All splice boxes shall be made inside the handhole and full boxes. All splice boxes shall be made inside the handhole and full boxes. All splice boxes shall be made inside the handhole and full boxes.

14. Neutral wires to have white isolation. Other circuits to be color coded by uninsulated conductors. All uninsulated conductors shall be made inside the handhole and full boxes.

15. Unless otherwise specified, all cable shall be single conductor, 20 percent conductivity stranded copper, with Tin isolation.

16. All splices shall be made in full boxes or the pole base. No splices shall be made inside the conduit.

17. All conduits shall be made in full boxes or the pole base. No splices shall be made inside the conduit.

18. All conduits that will remain empty as spares shall be marked, dated, cleaned, wired, and then capped. Leave the corrosion resistant, flame retardant, and place such markers on full boxes to mark the location of the ends of the conduit.

19. Pull boxes shall be located at ends of conduit crossing roadways.

20. These plans represent minimum acceptable criteria. The inspection of these drawings represent the minimum base of acceptance.

21. All material, unless otherwise specified, shall be underwriters laboratory approved.

22. Prior to any equipment order, the contractor shall submit for approval, drawings, specifications, and all material proposals for the project and must include specifically:

a) Luminaire Photometrics
b) Pole Strength Calculations
c) Pole Stability Test Results
d) Bolt Specifications and Bolt Circle Diameter

23. All equipment, including the handhole, must be submitted to the state traffic operations engineer at the following address: Department of Transportation, MDO Building, Room 540, Tallahassee, Florida 32304.
**METAL POLE CONCRETE FOUNDATION DETAIL**

- **BOLT CIRCLE**
  - Bolt projection diameter and bolt length per manufacturer's specs (submit data required)

- **CONDUIT ELBOW**
  - Edge to match job
  - 5/8 wire, nominal 8" fitting (if flat turning at top)/1/2 fitting (at bottom)
  - No welding permitted on reinforcing cage
  - Reinforcing steel to be grade 40 or 60

- **SCREW TYPE FOUNDATION SPECIFICATIONS**
  1. The foundation shaft and base plate shall be ASTM A-36 structural steel, or better.
  2. The anchor bolts shall be ASTM A-325, or better.
  3. All welds shall be sufficient to withstand 10,000 psi. of torque, applied about the axis of the foundation.
  4. The foundation shall have a handle in the base plate at least 6" in diameters.
  5. The base plate shall be noted to indicate the orientation of the shaft/cable/ware.
  6. Drainage shall be provided in the bottom of the foundation by means of an opening of at least 3 square inches.
  7. The foundation shall be designed for installation using a right hand turn wrench with a 5/8" flat head pressure.
  8. The maximum installation torque shall not exceed 10,000 ft.-lb. or be less than 3,200 ft.-lb.
  9. The whole foundation shall be hot dip galvanized after fabrication to ASTM A-122.

**PRECAST OR POURED IN PLACE**

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**CONDUIT MARKER DETAIL**

- Pull box
- All splices shall be made in pull box or pole base with compression sleeves or bushings and connectors properly taped and weatherproofed

- **GROUND ROD**
  - 1/2" x 48" or 4" Schedule 40 PVC unless otherwise noted in schematic and plans

- **PULL BOX WIRING DETAIL**
  - Pull box
  - Ground rod
  - Ground clamp for connecting pole ground, bare bond wire, and ground rod. Ground bonding screws shall make contact with clamps used to connect bonding conductors to ground rod for a distance of 1-1/2", measured parallel to the axis of the ground rod.

**PULL BOX DETAILS**

- **SCREW TYPE FOUNDATION DETAIL**
  - Anchor bolt diameter as per pole manufacturer's specifications
  - Bolt circle diameter to match pole
  - Bolt hole to be drilled and tapped

- **TRENCH DETAIL**
  - Backfill with selected soil above in 6" lifts

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**PULL BOX SPECIFICATIONS**

- Pull box shall be composed of reinforced plastic mortar and be designed and tested to ASTM C-1503, flammability test and armor in loading 400 lb. mobile vehicle load over any 10' x 10' area to be marked "street lighting.

- Boxes may be nested for deep conduit and for more working room.

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**FLORIDA DEPARTMENT OF TRANSPORTATION**

**TRAFFIC OPERATIONS**

**ROADWAY LIGHTING DETAILS**

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DETAIL "A"
AERIAL FEED

1. PHOTO ELECTRIC CONTROL AS REQUIRED.
2. ALL NEUTRAL WIRES TO HAVE WHITE INSULATION, CIRCUIT NO 1 WIRES TO HAVE BLACK INSULATION. OTHER CIRCUITS TO BE COLOR CODED BY INSULATION. DO NOT USE WHITE OR GREEN INSULATED WIRES FOR UNDERGROUND CONDUCTORS.

DETAIL "B"
UNDERGROUND FEED

CONCRETE POLE, PRESTRESSED TYPE B, 30' LONG

CONCRETE POLE, PRESTRESSED TYPE B, 30' LONG

METER AS REQUIRED
HEIGHT SPECIFIED BY POWER COMPANY

METER AS REQUIRED
HEIGHT SPECIFIED BY POWER COMPANY

1" MIN INSULATED COPPER GROUND WIRE IN 1/2" GALVANIZED RIGID STEEL CONDUIT

1" INSULATED COPPER GROUND WIRE IN 1/2" GALVANIZED RIGID STEEL CONDUIT

GALVANIZED RIGID STEEL CONDUIT

U.L. APPROVED GROUND ROD: 5/8" DIA. 12' LONG COPPER CLAD TALL POLES AND SERVICE POLES

GROUND CLAMP FOR CONNECTING POLE
GROUND, BARBED WIRE, AND GROUND ROG

FULL BOX
(SEE DETAIL INDEX NO. 17504)

SERVICE POINT DETAILS

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC OPERATIONS

APPROVED BY FLGEN NO. 01-15-78

DATE REVIZIONS INITIALS DATES

DESIGNED BY
DRAWN BY
CHECKED BY
SUPERVISED BY

LESTER JONES

DRAWING NO INDEX NO:
1 OF 1 17504
TYPICAL SIGN FACE ELEVATION FOR C-H TRUSS

NOTE: SPRINGS OF VERTICAL HANGERS MAY BE VENTED SLIGHTLY OR AS NECESSARY TO CLEAR THE TRUSS STRUTS AND DIAGONALS AT PANEL POINTS.

STIFFENER DETAIL

SECTION C-C

SIGN FACE BRACE

SECTION B-B

GENERAL NOTES:
1. For "General Notes" Covering Specification, Materials and Wind Loads, see Sheet 1 of 4 and 3 of 4, Index 0553
<table>
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**NOTES:**

All reinforcing steel shall have a 3% minimum of concrete cover and shall be all Grade 60.

All required edges to be furnished.

The minimum dimension of concrete is to be observed.

For details and specifications, refer to the manufacturer's literature.

Min. cover to be observed.

**Diagram:**

- PLAN
- SECTION A-A
- SECTION B-B

**Construction:**

- For Columns and Beams
- Beams and Footings

**Overhead Type A, B, or C Trusses**

**State of Florida Department of Transportation Specifications**

- Footings for Overhead Bin Trusses
- Overhead Bin Design
- Bin Design Specifications
- Bin Design Details
- Bin Design Calculations

- Bin Design Notes

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**Material Specifications:**

- Steel Grades
- Concrete Grades
- Reinforcement Grades

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**Design Information:**

- Bin Design
- Bin Configuration
- Bin Size

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**Construction Guidelines:**

- Bin Foundation
- Bin Installation
- Bin Maintenance

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**Legal Notices:**

- Copyright Protection
- Trademark Registration
- Patent Information

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**References:**

- Bin Design Resources
- Bin Construction Resources
- Bin Maintenance Resources

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**Contact Information:**

- Bin Manufacturer
- Bin Contractor
- Bin Supplier

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**Approval:**

- Bin Design Approval
- Bin Construction Approval
- Bin Maintenance Approval
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**DESIGN NOTES**

- All Sign Pieces Not Lined. See Appendix B for Lined Sign Brackets.
- All Splices Made With Welded Aluminum Channel. Schedule 40 (3.5" x 3.5") by 1/4" Wall Thickness.
- Use Profile Of Larger Size Sign Height To Bottom Of Larger Sign.
- Signs Back To Back.

**WIND LOADING**

- ZONE 1 (50 M.P.H.)
  - Bedford, Brockton, Dover, Easton, Franklin, Hanover, Hingham, Holbrook, King Phillip, North King Phillip, Stoughton, Taunton, Walpole, Westerly, Wilmington, Wrentham.
  - Washington, West Quincy, West Roxbury, Wollaston, Westwood.
- ZONE 2 (75 M.P.H.)
- ZONE 3 (100 M.P.H.)
  - Agawam, Ludlow, Southwick, West Springfield.
  - ZONE 4 (125 M.P.H.)
  - None.

**SIGN BRACKET - TYPE I**

- Single Column (Ground Signs)

**SIGN BRACKET - TYPE II**

- Double Column (Walling Signs, Bridge Signs, Post Signs, Overhead Signs, and Box Signs).
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**GENERAL NOTES**

1. For sign identification, numbers are shown in the Top Profile of the Sign. The profile includes the number and the letters identifying the sign. The number shown in the Profile identifies the number of the support column. The letters signify the type of support column. No spaces are allowed between the number and the letters. The letters are always in the Top Profile. The support column must be at least 96% of the corresponding sign height. The height of the support column must be equal to or greater than the height of the sign.

2. All columns in the Trestle are Aluminum Trestle. The inside dimension of the Trestle is 96% of the sign height. The Trestle must be fabricated according to the American National Standard for Steel Bridges. The Trestle must be fabricated according to the American National Standard for Steel Bridges. The Trestle must be fabricated according to the American National Standard for Steel Bridges.

3. The footing for the Trestle must be reinforced with at least two bars of reinforced concrete. The bars must be at least 2 inches in diameter and must be spaced at least 12 inches apart. The footing must be at least 6 feet deep and must be at least 3 feet wide at the base. The footing must be at least 6 feet thick and must be at least 3 feet wide at the base. The footing must be at least 6 feet thick and must be at least 3 feet wide at the base. The footing must be at least 6 feet thick and must be at least 3 feet wide at the base.

**SLIP BASE DETAILS**

1. Slip base must be made of a material that is suitable for use in the project. The slip base must be at least 2 inches thick and must be at least 1 foot wide at the base. The slip base must be at least 2 inches thick and must be at least 1 foot wide at the base. The slip base must be at least 2 inches thick and must be at least 1 foot wide at the base. The slip base must be at least 2 inches thick and must be at least 1 foot wide at the base.

2. The slip base must be installed according to the American National Standard for Steel Bridges. The slip base must be installed according to the American National Standard for Steel Bridges. The slip base must be installed according to the American National Standard for Steel Bridges. The slip base must be installed according to the American National Standard for Steel Bridges.

3. The slip base must be anchored to the footing using at least two bolts. The bolts must be at least 1 inch in diameter and must be spaced at least 12 inches apart. The bolts must be at least 1 inch in diameter and must be spaced at least 12 inches apart. The bolts must be at least 1 inch in diameter and must be spaced at least 12 inches apart. The bolts must be at least 1 inch in diameter and must be spaced at least 12 inches apart.
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**GENERAL NOTES**

1. For sign identification numbers see Sheet titled "Sign Profile and Identification Numbers." Use the sign identification number and the reference column height to determine the proper Calcium Size and a passenger size. The sign identification number shown in the table is the maximum height from ground to Bottom of sign. Size of Calcium Size cannot be used for a particular application. This table shows the maximum height to be used for the design. The sign will be placed in a position that is appropriate for the location.

2. B-4 Columns in the Table are Aluminum Tolerant (Killer) Outside Diameter Tolerances. Size 2 & 4 thru 14.

3. Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

4. B-3 Thrust Sleeves are Breakaway. They are made to be used in Round Coupling Connections or Single Column Footing. The Compressor will be placed in a position that is appropriate for the location.

5. B-5 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

6. B-6 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

7. B-7 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

8. B-8 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

9. B-9 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

10. B-10 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

11. B-11 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

12. B-12 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

13. B-13 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

14. B-14 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

15. B-15 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

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17. B-17 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

18. B-18 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

19. B-19 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

20. B-20 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

21. B-21 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

22. B-22 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

23. B-23 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

24. B-24 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

25. B-25 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

26. B-26 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

27. B-27 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

28. B-28 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

29. B-29 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

30. B-30 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

31. B-31 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

32. B-32 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

33. B-33 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

34. B-34 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

35. B-35 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

36. B-36 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

37. B-37 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

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39. B-39 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

40. B-40 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

41. B-41 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

42. B-42 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

43. B-43 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.

44. B-44 Pipe is Tolerant. The Compressor will be placed in a position that is appropriate for the location.
**SPECIFICATIONS**

ENFORCED TOLERANCE: All dimensions shall meet the requirements of the American National Standards Institute (ANSI) ASA B40.1 and the A.S.T.M. Specifications B-621.

TOLERANCE: All dimensions shall be in keeping with the A.S.T.M. Specifications B-621.

ALUMINUM BOLT, NUT, AND COVERSHEETS: All Aluminum bolts shall meet the requirements of the American Association for State Highway and Transportation Officials (AASHTO) Specification A193. The bolts shall have an effective coating of at least 0.003" thick and comply with Section 2.8 of the AASHTO Specification. The aluminum cover sheet shall meet the requirements of the Aluminum Association A540-70. The cover sheet shall be 0.062" thick and shall be furnished in accordance with the requirements of A.S.T.M. Specification A-381.

MATERIAL STRESSES: All allowable stresses are in accordance with the allowable stress specified for the material by the American Society for Testing and Materials (ASTM) and the American Institute of Steel Construction (AISC).

SHEETS AND PLATES: The material used shall meet the requirements of the American Society for Testing and Materials (ASTM) Specification A36 and the American Institute of Steel Construction (AISC). The material used shall meet the requirements of the American Society for Testing and Materials (ASTM) Specification A572.

SHOP ORIGINES: The Contractor shall submit complete Shop Drawings before fabrication for approval by the Engineer.

ALUMINUM BASES: All anchor bolts, sleeves, and cold-weather stud shall meet the requirements of A.S.T.M. Specification A-307 and shall be of the same material in accordance with the requirements of A.S.T.M. Specification A-307.

NOTE: For Column Size not listed use next Larger Diameter and Wall Thickness.
FOR FREEWAY USE

WEIGH STATION 1 MILE

ALL TRUCKS ENTER WEIGH STATION

WEIGH STATION NEXT RIGHT

WEIGH STATION

FOR OTHER THAN FREEWAY USE

WEIGH STATION 1 MILE

ALL TRUCKS ENTER WEIGH STATION

WEIGH STATION 1000 FT

NOTE:
ALL SIGNS TO HAVE GREEN REFLEREORIZED BACKGROUND WITH WHITE LEGEND AND BORDER;
EXCEPT SIGNS NO. FTO-4 & FTO-8;
WHICH SHALL HAVE WHITE BACKGROUND WITH BLACK LEGEND AND BORDER;
ALL DIMENSIONS SHOWN ARE IN INCHES AND EIGHTHS.

SIGN NO. FTO-11: TO BE USED WITH SIGNS NO. FTO-5A & B, FTO-15A & B.
SIGN NO. FTO-2: TO BE USED WITH SIGN NO. FTO-3.

NOTE

ILLINOIS DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING

TYPICAL SIGNING FOR TRUCK WEIGH AND INSPECTION STATIONS

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ILLINOIS DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING

TYPICAL SIGNING FOR TRUCK WEIGH AND INSPECTION STATIONS

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WEIGH STATION
AGRICULTURAL INSPECTION
1 MILE

ALL TRUCKS-TRAILERS
PICKUPS-VANS
NEXT RIGHT

WEIGH STATION
AGRICULTURAL INSPECTION
NEXT RIGHT

TRUCKS-TRAILERS
PICKUPS-VANS

NOTE:
FTG-164 - RIGHT ARROW
FTG-165 - LEFT ARROW

SIGN NO. FTG-164
5' x 8'-0"
2" BORDER - 8" RAD.

SIGN NO. FTG-165
5' x 8'-0"
2" BORDER - 8" RAD.

SIGN NO. FTG-166
15'-0" x 2'-0"
2" BORDER - 9" RAD.

SIGN NO. FTG-168
8'-0" x 3'-0"
2" BORDER - 9" RAD.

SIGN NO. FTG-169
12'-0" x 7'-0"
2" BORDER - 9" RAD.

NOTE:
ALL SIGNS SHALL HAVE GREEN REFLECTORIZED BACKGROUND WITH WHITE LEGEND AND BORDER, EXCEPT SIGNS FTG-164 WHERE SHALL
HAVE A WHITE BACKGROUND WITH BLACK LEGEND AND BORDER.

ALL DIMENSIONS SHOWN ARE IN INCHES AND EIGHTS
6. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK
   WITHOUT A SPEED REDUCTION
   (2 Lanes - 2 Way Traffic)

7. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK
   WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS
   (4 Lanes Divided - 2 Way Traffic)

<table>
<thead>
<tr>
<th>APPROACH SPEED MPH</th>
<th>SUGGESTED DISTANCE IN FEET</th>
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<tbody>
<tr>
<td>25 TO 35</td>
<td>275 50</td>
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<tr>
<td>36 TO 45</td>
<td>350 65</td>
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<td>46 TO 55</td>
<td>500 80</td>
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* Distances shall be increased by adding the intersecting street width (curb returns included) to dimensions given in table.
9. Traffic control devices at school entrances where there are little or no walking students

These signs are intended for use only at those few locations where the school entrance is not evident to the motored, and must be approved in advance by the responsible traffic engineering authority.

10. Traffic control devices for a typical school zone fronting the school property

School zone limits for unprotected activity as defined by local school board through the local traffic engineers.

Note:
- Roll-out school signs shall not be utilized to control traffic through an established school zone.
- The school bus stop ahead sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500 feet in advance. It shall have a minimum size of 30 x 30, and it is not intended that these signs be used whereever a school bus stop to pick up or discharge passengers. These signs are intended for use only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility.

Florida Department of Transportation

SCHOOL SIGNS & MARKINGS

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<tr>
<th>REVISIONS</th>
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Design: 
Florida Department of Transportation

Paper No. 1009

Drawing No. 1009

40 OF 41 1/48/82
1. All signs shall be reflectorized.

2. Standard size signs should be used whenever possible. Minimum sizes may be used only on low volume, low speed (less than 35 mph) streets. Special sizes should be used on expressway facilities where special emphasis is needed.

3. The value of the actual school zone speed limit shall be determined by the district traffic operations engineer in cooperation with local school superintendents. In no case shall it be less than the 15 mph minimum set by law.

4. Flashing beacon may be placed within or below panel.

NOTES

- GALVANIZED STEEL CONSTRUCTION

- SCHOOL SPEED LIMIT

- SCHOOL DAYS: 0:00-0:00, 0:00-0:00

- SCHOOL ZONE: 0:00 MPH

- WHEN FLASHING

- END SCHOOL ZONE

- 24" x 36" OFFICE BOARD

- OVERHEAD STANDARD

- 1 1/4" Border - 2 1/4" Rad

- BLACK ON WHITE

- SCHOOL ENTRANCE

- 36" x 36"

- SCHOOL ZONE: 0:00 MPH

- WHEN FLASHING

- SCHOOL ZONE: 0:00 MPH

- END SCHOOL ZONE

- 24" x 30"

- BLACK ON WHITE

- 1 1/4" Rad

- RSB-107

- FTG-35

- 1/4" Border

- MARGIN 3/8"

- 22" x 24"

- BACKGROUND

- BLACK ON REF. YELLOW BACKGROUND

- SCHOOL SIGNS & MARKINGS

- COLOR: BLACK ON REF. YELLOW BACKGROUND

- REVISED: 11-19-84

- L. C. Taylor

- Approved by R. C. MacGregor

- School Director of Transportation

- Traffic Operations
PLACEMENT OF REFLECTIVE PAVEMENT MARKERS AND
DELINEATOR POSTS FOR NON-LOOP RAMPS

PLACEMENT OF REFLECTIVE PAVEMENT MARKERS AND
DELINEATOR POSTS FOR LOOP RAMPS

TYPICAL RAMP TERMINALS
AT CROSSROAD
(ENTRANCE AND EXIT)

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC OPERATIONS

INTERCHANGE MARKINGS

REVISIONS

DATE DESCRIPTION

REVISIONS

DATE DESCRIPTION

INITIALS DATES

TECHNICAL SHEET APPR.

CHECKED BY

APPROVED BY

DRAWING NO.

SCALE

DRAWING NO.

SCALE

DRAWING NO.

SCALE

4 OF 4

1:1000

1:50

1:50
PAVEMENT MARKING FOR WHEELCHAIR RAMPS IN PARKING ZONES

NOTE:
ALL PARKING AND REFUGE LANE MARKINGS SHALL BE 4" WHITE

ON STREET PARKING

TYPE 1

SPEED LIMIT
50 MPH OR LESS
35 MPH OR MORE

NO PARKING ZONE MARKER - YELLOW CURB

MIN
MIN
MIN

TYPE 2

300 MAX INTERVALS BETWEEN DOUBLE ARROWS

TYPE 3

For mid-block driveway clearance from parking stall to the drop curb shall be 20 ft.

FLORIDA DEPARTMENT OF TRANSPORTATION
Traffic Operations

SPECIAL MARKING AREAS

REV 0

INITIALS: A.A.

SPECIAL MARKING AREAS

DATE: 6-14-15

Recommended for approval

State Traffic Operations Divisions

Approved

Drawn by:

Person

Check by:

K.R.

App. #: 17346

D-2-03

Florida Department of Transportation

2600 N. Orange Blossom Trail

Orlando, FL 32887

(407) 850-6100

FL-2-03

Type, Traffic Operations Divisions

Drawn by:

Person

Check by:

K.R.

App. #: 17346

D-2-03

Florida Department of Transportation

2600 N. Orange Blossom Trail

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D-2-03

Florida Department of Transportation

2600 N. Orange Blossom Trail

Orlando, FL 32887

(407) 850-6100
TYPICAL INTERSECTION 2 THRU LANES PLUS LEFT TURN LANE, WITH CROSSWALK

DETAIL "A"

RIGHT TURN LANE DROP AND ISLAND DETAILS

STOP BARS, CROSSWALKS AND DOUBLE CENTER LINES DETAILS
BEGINNING OF A DIVIDED HIGHWAY

**NOTE**
RAISED PAVEMENT MARKERS SHALL BE SET IN THERMOPLASTIC AS SHOWN BELOW OR SET TWO (2) INCHES INSIDE PAINTED LINE AS SHOWN IN DETAIL A.

**PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE**
(TRAFFIC FLOWS IN SAME DIRECTION)

**PAVEMENT MARKING FOR TRAFFIC SEPARATION**
(TRAFFIC FLOWS IN OPPOSITE DIRECTION)

**FLORIDA DEPARTMENT OF TRANSPORTATION**
Traffic Operations

<table>
<thead>
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<th>SPECIAL MARKING AREAS</th>
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<td><strong>REVISIONS</strong></td>
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<td><strong>INITIAL DATES</strong></td>
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<td><strong>DRAWINGS</strong></td>
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<td><strong>INDEX NO.</strong></td>
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</table>

For placement of signs, no W-2, W-4-U and W-3 see sheet 5 of 5.
STATE OF FLORIDA WELCOME CENTER

NOTE: DISTANCE MESSAGE OF ¹/₂ MILE MAY BE USED TO KEEP THIS SIGN WITHIN THE STATE LINE.

TOURIST INFORMATION CENTER NEXT RIGHT

NOTE: ROADWAY NOT DRAWN TO SCALE
DISTANCES SHOWN ARE APPROPRIATE FOR ACCURATE DRIVER COMMUNICATION BUT MAY BE ALTERED SLIGHTLY IF FIELD CONDITIONS REQUIRE.

REVISIONS

DATE | INITIALS | DESCRIPTION
--- | --- | ---

FLORIDA DEPARTMENT OF TRANSPORTATION

WELCOME CENTER SIGNING
FOR LIMITED ACCESS HIGHWAYS

STATE OF FLORIDA OFFICIAL WELCOME CENTER

NOTE: SIGN NO. FTO-20 SHALL BE LOCATED ON LIMITED ACCESS HIGHWAYS ONLY.

SIGN NO. FTO-20
5'-8" x 3'-0"
5'-8" x 3'-0"
5'-8" x 3'-0"

STATE OF FLORIDA WELCOME CENTER

SIGN NO. FTO-17
6'-6" x 19'-0"
3'-0" x 19'-0"
3'-0" x 19'-0"

STATE OF FLORIDA WELCOME CENTER

SIGN NO. FTO-8
3'-0" x 19'-0"
3'-0" x 19'-0"
3'-0" x 19'-0"

NOTE: ROADWAY NOT DRAWN TO SCALE
DISTANCES SHOWN ARE APPROPRIATE FOR ACCURATE DRIVER COMMUNICATION BUT MAY BE ALTERED SLIGHTLY IF FIELD CONDITIONS REQUIRE.

NOTE: SIGN SHALL HAVE BLUE REFLECTORIZED BACKGROUND WITH WHITE REFLECTORIZED LEGEND & BORDER. SIGN NO. FTO-71 SHALL BE USED AS A SUPPLEMENTAL GUIDE SIGN AT INTERCHANGES WHICH HAVE A TOURIST INFORMATION CENTER APPROVED FOR SUCH SIGNING (LOCATE HALF WAY BETWEEN NORMAL GUIDE SIGN.)
STATE OF FLORIDA
WELCOME CENTER
1 MILE

SIGN NO. FTO-22A
4'-6" x 12'-6"
2" BOR - 9' RAD.
BLUE REFLECTIVE BACKGROUND
WHITE REFLECTIVE LEGEND & BORDER

1/2 MILE

SIGN NO. FTO-22B
3'-0" x 12'-6"
2" BOR - 9' RAD.

NOTE:
ROADWAY NOT DRAWN TO SCALE

800' MAXIMUM FOR RURAL CONDITIONS
50' MINIMUM FOR CONGESTED AREAS

NOTE:
EITHER ONE BUT NOT BOTH OF SIGNS FTO-22A OR B
SHOULD BE USED DEPENDING ON SPEED, ROADSIDE
DEVELOPMENT & GEOMETRIC CONDITIONS.

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

SIGN NO. FTO-19
4'-6" x 12'-6"
2" BOR - 9' RAD.
BLUE REFLECTIVE BACKGROUND
WHITE REFLECTIVE LEGEND & BORDER
ORANGE REFLECTIVE STATE SILHOUETTE
(SIGN NO. FTO-19 TO BE PAID FOR WITH FUNDS OTHER THAN DOT)

NOTES:
1. SIGNS AND SIGN STRUCTURES SHALL BE ERECTED IN ACCORDANCE
   WITH THE DETAILS SHOWN ON INDEX 9533.
2. SIGN FTO-19 SHALL BE LOCATED ON THE WELCOME CENTER GROUNDS
   IN PROXIMITY TO THE BUILDING AND AS FAR FROM THE MAIN LINE
   ROADWAY AS POSSIBLE (2 SIGNS BACK TO BACK).
3. DETAILS OF FLORIDA SYMBOL IS AVAILABLE ON REQUEST FROM TRAFFIC
   OPERATIONS OFFICE OF DOT.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC OPERATIONS
WELCOME CENTER SIGNING
FOR PRIMARY HIGHWAYS

REVISIONS

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DRAWN BY: W.B. 6-75
CHECKED BY: 6-75
SUPERVISED BY: K.R. 6-75
Alternating Skip Line

Double Solid Line

Solid Line With Alternating Skip

Skip Line

Solid Line With Skip

Solid Line With Alternating Skip

Note:
Reflective Pavement Markers shall be placed 40" c/s in all

For Pavement Arrow Requirements see index 7346.
DIRECTION OF TRAVEL WITH STATIONING

NOTES
1. FOR LANE LINES SEPARATING ONE-WAY TRAFFIC, RAISED REFLECTIVE MARKERS SHALL BE BI-DIRECTIONAL (COLORLESS & RED).
2. FOR CENTER LANE MARKINGS, FOR TWO-WAY TRAFFIC, RAISED REFLECTIVE MARKERS SHALL BE BI-"HOCH" (AMBER & AMBER), EXCEPT WHERE PASSING IS RESTRICTED IN ONE DIRECTION ONLY.
3. RAISED REFLECTIVE MARKERS SHALL BE PLACED 40 G.G. ON ALL PROJECTS; HOWEVER, ON SHARP CURVES LESS THAN 40° MAY BE USED, IF SPECIFIED BY THE PLANS.
4. ALL MARKINGS SHALL BE APPLIED BEFORE RAISED MARKERS ARE INSTALLED.

PAINTED TRAFFIC LINES
FTO-30

Notes:
The color of the sign shall be high intensity silver-white reflective background with black opaque border and legend.

FTO-29
COUNTY ROUTE MARKER DETAIL

Note: When used on a guide sign, shield must be overlaid on a 36" x 36" white reflective background.

Color: Yellow reflective legend and border on blue reflective background.

EXIT PANEL (GORE INSTALLATION)

The exit number shall be centered in the space provided on sign panel.
Color is reflective green background with reflective white legend and border.

Color: Yellow reflective legend and border on blue reflective background.

SPECIAL SIGN DETAILS

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION RESEARCH

REVISIONS

INITIALS

DATE

DESCRIPTION

SCHEDULED BY

DRAFTED BY

DRAWN BY

CHECKED BY

APPROVED

DRAWN BY

SPECIAL SIGN DETAIL
Notes:
1. All letters are 1/2" Series "C".
2. Top portion of sign shall have a reflectorized blue background with white reflectorized legend & border.
3. Bottom portion of sign shall have a reflectorized white background with black opaque legend & border.

Notes:
1. All letters are 1/2" Series "C".
2. Top portion of sign shall have a reflectorized blue background with white reflectorized legend & border.
3. Bottom portion of sign shall have a reflectorized white background with black opaque legend & border.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC OPERATIONS

SPECIAL SIGN DETAILS

REVISIONS
DATE INITIALS DESCRIPTIONS INITIALS/DATES
R-80 K-H REVISIONS, BORDER DIMENSIONS

INITIALS/DATES
SUPERVISED BY

SUPERVISED BY

R. E. Martin, P.E.

2 of 3 17355
NUMERICAL SIZE

1 or 2 Digits 12" Series "C" - 24" x 24"
3 Digits 6" Series "B" - 24" x 24"
4 Digits 6" Series "B" - 24" x 30"
More Than 4 Digits 6" Series "B" - 24" x 30"

Notes:
1. All state route markers and auxiliaries shall have black opaque legend and border with white reflective background.
2. Full size prints are available from Tallahassee Traffic Operations.
3. Green reflectorized background with white reflectorized legend and border.

FLORIDA ROUTE MARKER FOR INDEPENDENT USE

FTO-28

FLORIDA SHIELD FOR GUIDE SIGN USE

Notes:
1. Florida shield shall have black opaque legend with white reflective background.
2. Full size prints are available from Tallahassee Traffic Operations.
**FIGURE A**
For use in areas not exposed to vehicular traffic and under driveways.

- May be adjusted in field due to field conditions, for approval of project engineer.

**FIGURE B**
For use in asphalt roadway adjacent to gutter when placement outside of the pavement is not feasible.

- Trench not to be open more than 25% at a time when construction area is subject to vehicular or pedestrian traffic.
- Asphalt to be sawcut and removed to leave neat lines on both sides of the cut pavement.

**FIGURE C**
For use in installing conduit under existing asphalt pavement not adjacent to gutter when jacking is not feasible.

- Rigid conduit must be used when jacking under existing pavement at 3' minimum depth.
- Asphalt to be sawcut at the edges of the trench.

**FIGURE D**
For use in installing conduit under sidewalk.

- Sidewalk patches to match existing joints.
- Entire sidewalk slab must be removed when specified in the plans.
- Backfill and tamping with material from trench except at driveways. Backfill & length of trench within the driveway entirely with Class I concrete.

**FIGURE E**
For use installing conduit under a new roadway prior to installation of curbs, base and pavement.

- Minimum necessary.
FIGURE A
PULL BOX ENTRY OF CONDUIT UNDER SIDEWALKS

FIGURE B
NOTE:
ONE RUN OF CONDUIT (BETWEEN PULL BOXES)
SHALL NOT CONTAIN MORE THAN 360 OF BEND
INCLUDING PULL BOX BENDS

FIGURE C
FOR USE UNDER RAILROADS

* IN CASE OF MULTIPLE TRACKS, THE MEASUREMENT IS TO BE FROM THE CENTERLINE OF THE OUTSIDE TRACK.
FIGURE A
CABLE DROP AND TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "B"

FIGURE B
CABLE DROP AND TERMINATION DETAIL
AERIAL INTERCONNECT MESSENGER WIRE WITH CLAMPS

NOTES:
1. THE MESSENGER WIRE OF THE INTERCONNECT CABLES SHALL BE GROUNDED TO THE LOWER GROUND WIRE OF THE POLE OR TO THE EXTERNAL WIRE EXTENDING DOWN THE POLE.

2. WHEN INSTALLING THE EXTERNAL GROUND WIRE TO THE POLE, A PIECE OF 1/4 IN. WOOD CONTACT SHALL EXTEND ON THE POLE EXTERNALLY TO A POINT EIGHT (8) FEET ABOVE FINISH GROUND TO PROTECT THE GROUND WIRE CONNECTING THE MESSENGER WIRE TO THE GROUND ROD.

3. LOCKING CABLE TIES OR LACING WIRE WHEN USED SHALL BE PLACED NO FURTHER THAN ONE (1) FOOT AWAY EXCEPT AT THE POINT OF CABLE DROP OR TERMINATIONS WHERE ONE (1) FOOT MAXIMUM AT THE POINT WHERE THE CABLE SEPARATE FROM THE SUPPORT POLE. WHEN USING FIGURE "B" INTERCONNECT CABLE ONLY THE LOCKING CABLE TIES SHALL BE USED.

4. IF ACCESSIBLE, THE INTERNAL GROUND WIRE OF THE SUPPORT POLE MAY BE USED TO GROUND THE MESSENGER WIRE.
FIGURE A
AERIAL FEED
(NO METER USED)

FIGURE B
AERIAL FEED
(METER USED)

FIGURE C
UNDERGROUND FEED
(NO METER USED)

FIGURE D
TYPE B UNDERGROUND FEED
(METER USED)

FIGURE E
UNDERGROUND CABINET MOUNTED
(METER USED)
**DETAILS FOR SPLICING LOOP WIRE TO LEAD-IN WIRE**

**STEP 1**
- Lead-in Wires - Draw Wire - Loop Wires
- Strain Loop and Lead-in Cable Conductors
- Place Heat Shrinkable Silicone Lined, Cross-linked Polyethylene Insulating Tubing to be used on Min. Tubing over Lead-in Cable and Individual Conductors.

**STEP 2**
- Twist the Bare Conductors Together
- Crimp the Bare Conductors Together with an Uninsulated Butt Connector

**STEP 3**
- Solder each splice using resin-core solder

**STEP 4**
- Wrap each splice with silicone tape
- Half-lap starting at center of splice and proceeding to the right or left; past each end of splice, then proceeding to the left (or right) past other end of splice, and returning to center and wrapping each splice with an all weather heavy duty electrical tape in the same manner; past each end of silicone tape

**STEP 5**
- Half-lap the two splices together with an all weather heavy duty electrical tape past the end of the lead-in cable duties cover about 1/2 past father most wrap of Step 4
- Slide Heat Shrinkable Tubing Over Splices, the Tubing shall cover 1/2 of the conductor insulation at each end of splice, heat tubing as specified by manufacturer

**ALTERNATIVE 1**
- Drill a hole through the curb at the point where the required saw cut depth is obtained. Prior to cutting the top inside edge of the curb, slide a section of flexible conduit at least 3' into the hole from the back side of the curb but not within 2' of the top of the hole. The conduit shall be cut to length. Fit between the curb surface and the level of the curb surface. Nonmetallic material shall be used to prevent excessive loop sealant from entering the flexible conduit

**ALTERNATIVE 2**
- Drill a hole, 3' to 1' larger in diameter than the rigid conduit to be used through the roadway, asphalt or concrete surface and base at an appropriate angle to intersect the trench or pull box hole. Place a predetermined length of rigid conduit in the hole and conduit. Install a molded bushing (nonmetallic) in the roadway end of the rigid conduit. The top of the rigid conduit shall be approximately 1' below the roadway surface. A nonmetallic material shall be used to prevent excessive loop sealant from entering the flexible conduit

**GENERAL NOTES**
1. If the loop lead-in to 1/2" or less from the edge of the loop to the detector on controlling system, continue the twisted pair to the detector. If the lead-in to connector is to continue the twisted pair to the specified pull-box splice to be connected to connector. (This note does not apply to Type VI)
2. The minimum saw cut depth shall be 1' on existing roadway. On new roadway construction projects requiring loop installations, loop and lead-in may be installed in the asphalt base prior to the placement of the final asphalt surface. The minimum saw cut depth shall be such that the bottom of the loop wire is not greater than 2' below the final wearing surface.
3. The width of saw cuts shall be sufficient to allow uniform placement of loop wires or lead-ins into the saw cut but not greater than

**FLORIDA DEPARTMENT OF TRANSPORTATION**

**VEHICLE LOOP INSTALLATION DETAILS**

**REVIEWS**
- DATE
- INITIALS
- DESCRIBED

**CONTRACTOR**

**DATE**

**INVOICE**

**DRAFT**

**NO.**

**DRAWING**

**NO.**

**REV.**

**NO.**

**SHEET**

**NO.**

**SPECIAL INSPECTION CERTIFICATE**

**ISSUED**

**RECEIVED**

**SPECIAL INSPECTION CERTIFICATE**

**ISSUED**

**RECEIVED**

**SPECIAL INSPECTION CERTIFICATE**

**ISSUED**

**RECEIVED**

**SPECIAL INSPECTION CERTIFICATE**

**ISSUED**

**RECEIVED**

**SPECIAL INSPECTION CERTIFICATE**

**ISSUED**

**RECEIVED**
POLE MOUNTED CABINET

INTERCONNECT JUNCTION BOX

NOTES:
1. NUMBER, SIZE AND DIRECTION OF CONDUIT
SWEET WILL VARY ACCORDING TO SITE CONDITION
INDICATION OF LOCATION, ONE SPARE IF THE CONDUIT
IS UNDERGROUND. WHEN THE CABINET BASE IS
SITING IN THE DIRECTION OF THE 
SWEET, CABINET BASE IF
CONDUIT MINIMUM 2 MIN. ON
SIDE A MIN. 12" MIN. A
SIDE THE CONDUIT WILL
BE SERViced BY THE AGRILITY
ENGINEER, THE OUTLET
SHOULD BE CAPPED WITH A WEATHER PROOF FITTING.

2. GROUNDING TO BE IN ACCORDANCE WITH SECTION
SEC. 620 OF THE STANDARD SPECIFICATIONS.

BASE MOUNTED CABINET

FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY DEPARTMENT

CABINET INSTALLATION DETAIL

INITIAL S. DATE

J. W. M.

DRAWING NO. I I 30920 1 OF 1
17841
SIGNALIZED INTERSECTION
Vehicle Movements & Signal Head Number Assignments Are Not Necessarily Oriented But Shall Maintain Their Relative Orientation About the Intersection (I.E. Movements Tends 4 Are Always To The Right Of Movements 1 And 5 Etc.)

LEGEND
1 Vehicle Movement Number
2 Pedestrian Movement Number
3 Timing Function Number
4 Phone Number
5 Green Arrow (Left or Right)
6 Red Arrow
7 Yellow Arrow

SIGNAL CLEARANCE TABLE
(Bean indicates no clearance required)

<table>
<thead>
<tr>
<th>From</th>
<th>R</th>
<th>Y</th>
<th>Y</th>
<th>Y</th>
<th>Y</th>
</tr>
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<tbody>
<tr>
<td>To</td>
<td>G</td>
<td>G</td>
<td>G</td>
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<td>G</td>
</tr>
</tbody>
</table>

*CLEARANCE INDICATION WHEN-YELLOW ARROW IS USED.*
ACUTE ANGLE (AND RIGHT ANGLE)

SIGNAL PLACEMENT AT RAILROAD CROSSING (2 LANES, CURB & GUTTER)

OBTUSE ANGLE

SIGNAL PLACEMENT AT RAILROAD CROSSING (2 LANES, CURB & GUTTER)

GENERAL NOTES

1. The location of flashing signals and stop lines shall be
   established based on satisfactory traffic control
   and prevention installation of signals with supervision taken thoroughly.

2. Where plans call for railroad traffic control devices
   technicians, installations in different positions. The minimum
   width of the median shall be 10 feet.

3. Location of railroad traffic control device is based on
   the distance available between face of curb and sidewalk.

4. To 6' - locate device outside sidewalk
   over 6' - locate device between face of
   curb sidewalks.

5. Striping to be perpendicular to edge of roadway.

6. Distance nearest rail, on a plane and
   parallel to edge, when present.

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DEPARTMENTS
RAILROAD CROSSING TRAFFIC CONTROL DEVICES

REVISED

DATE / INITIAL DESCRIPTION
7-19-77 JL Adds one type pedestrian crossing
11-15-79 JL Notes that note to index
6-17-79 JL Removes notes that are identical to number
8-23-79 JL Notes that note to index
5-17-79 JL Notes that note to index
2-20-81 JL Adds one type pedestrian crossing

DRAWING No.
INDEX No.
17882

17882