### JANUARY 1, 2007 UPDATES

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Introduction

Plans Preparation Manual, Volume II

PURPOSE:

This Plans Preparation Manual, Volume II sets forth requirements for the preparation and assembly of contract plans for Florida Department of Transportation (FDOT) projects. The information contained herein applies to the preparation of contract plans for both roadways and structures.

AUTHORITY:

Sections 20.23(3)(a) and 334.048(3), Florida Statutes.

SCOPE:

This procedure impacts anyone preparing roadway and structures contract plans for the Department.

GENERAL INFORMATION:

Chapter 334 of the Florida Statutes, as part of the Florida Transportation Code, establishes the responsibilities of the State, counties, and municipalities for the planning and development of the transportation systems serving the people of Florida, with the objective of assuring development of an integrated, balanced statewide system. The Code's purpose is to protect the safety and general welfare of the people of the State and to preserve and improve all transportation facilities in Florida. Under Section 334.048(3), the Code sets forth the powers and duties of the Department of Transportation including to adopt rules, procedures and standards for the conduct of its business operations and the implementation of any provisions of law for which the Department is responsible.
PROCEDURE:

The standards and applications contained in this volume of the Plans Preparation Manual are requirements for the design and preparation of contract plans used in the construction of FDOT projects. This volume is to be used in conjunction with Volume I of the Plans Preparation Manual (PPM) (Topic No. 625-000-007).

The preparation of roadway and structures plans is primarily a matter of sound application of acceptable engineering criteria, standards and presentation techniques. While the requirements contained in this volume provide a basis for uniformity in plans preparation, precise formatting and presentation standards which apply to individual situations must rely on good engineering practice and judgment. The use of these requirements does not relieve the engineer from the professional responsibility for the accuracy and completeness of the contract plans set(s).

1. PLANS PREPARATION MANUAL, VOLUME II - MANUAL ORGANIZATION
   a. Background
      The Florida Department of Transportation's Plans Preparation Manual was previously published as a two volume set in 1989. The manual preceded Department requirements for use of the Metric System, and featured only English units. Volume I contained design criteria and process requirements, while Volume II addressed plans preparation and assembly.

      This English version of Volume II was produced using the same basic format, and closely paralleling, Volume II - Metric. This was due in large part to the outdated information in the 1989 English version for such areas as Computer Aided Design Drafting (CADD), plans processing, sheet sizes, etc.

   b. Organization
      The Plans Preparation Manual, Volume II contains specific requirements for plans production and assembly. The manual consists of individual chapters, each addressing the requirements for a plan sheet or component, and is ordered according to the way a standard plans set would be assembled.
2. DISTRIBUTION

This document is distributed on CD through FDOT Maps and Publications Sales. Copies may be obtained from:

Florida Department of Transportation
Maps and Publications Sales, Mail Station 12
605 Suwannee Street
Tallahassee, FL 32399-0450
Telephone (850) 414-4050
FAX Number (850) 414-8036
http://www.dot.state.fl.us/MapsAndPublications/

For updates and manual registration information contact:

Roadway Design Office, Mail Station 32
Telephone (850) 414-4310
FAX Number (850) 414-5261
http://www.dot.state.fl.us/rrddesign/

3. REVISIONS AND UPDATES

Plants Preparation Manual holders are encouraged to submit comments and suggestions for changes to the manual to the Roadway Design Office. When ideas or suggestions are received they will be reviewed by appropriate Roadway and/or Structures Design staff in a timely manner and will be coordinated with other offices affected by the proposed change.

Structures design issues which are subject to modification and revision will be processed in coordination with the Structures Design Office.

Proposed revisions are distributed in draft form to the District Design Engineers (DDE). The DDE coordinates the review of the proposed revisions with other affected district offices such as Structures Design. The goal is to obtain a majority opinion before revisions are made.

The Roadway Design Office will also coordinate proposed revisions or additions with affected offices within the Central Office. Substantive revisions that result in policy change will be coordinated with the Executive Committee for concurrence.

Revisions are voted on jointly by the District Design Engineers and the State Roadway Design Engineer (for Roadway Design issues) or the State Structures Design Engineer (for Structures Design issues). Each district will have one vote and the central office will have two votes; for a total of ten votes. Requirements mandated by FHWA or State Rules will not be subject to this majority vote.
All revisions and updates will be coordinated with the Forms and Procedures Office prior to distribution to ensure conformance with and incorporation into the Department’s Standard Operating System. The standard interval for issuing updates to the PPM is yearly, in January, when the adopted revisions and addenda will be distributed to registered holders of the manual.

Items warranting immediate change will be made with the approval of the State Roadway Design Engineer in the form of a Design Bulletin.

**TRAINING:**

None required.

**FORMS ACCESS:**

Documents marked as **SAMPLES** provide only a starting point allowing users to change or alter the document as needed to fit specific situations. Samples are not official forms of the Department.
Chapter 1

Production of Plans

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Chapter 1
Production of Plans

1.1 General

This volume shall be used in conjunction with Volume I - English of the Plans Preparation Manual. Close attention must be paid to the harmonizing of design criteria and processes outlined in Volume I with the related areas of plans preparation and presentation required in this volume.

The contract plans set and the specifications are the key documents for project construction and on which the contractor bases his bid. Hence, it is imperative that the contract plans and specifications set forth the work to be done in a clear and concise manner.

The Engineer of Record (EOR) must provide quality control of plans, CADD files and deliverables as outlined in the Department's CADD Manual, Topic No. 625-050-001 (or latest version) and this volume. These resources, in conjunction with district and project scope requirements, shall form the basis for contract plans format and assembly.

Plan sheets content and appearance will follow the requirements of this volume. Refer to the FDOT CADD Production Criteria Handbook for such features as line weight, style, color, and level.

The exhibits shown in this volume were developed using FDOT criteria/standards in force at the time of their creation. See Volume I for criteria.
1.2 Legibility Guidelines

Normally, all letters and figures should be readable from either the bottom or right edge of the sheet. The guide for reading is as follows:

1. Horizontal Line: Read left to right
2. Vertical Line: Read bottom to top
3. Diagonals: Read left to right

Abbreviations may be used where they save time and space. Abbreviations must be clear and easily understood. A list of standard abbreviations is given in the Design Standards, Index No. 001.

Standard symbols for Roadway Design are shown in the Design Standards, Index No. 002, the Symbol Cell Library, and other CADD sources.
1.3 Displaying Information and Data

The following rules apply for displaying information and data in the plans:

1. Dimensioning Requirements:
   a. Typical Section Elements, including lane widths and shoulder widths - in feet, generally as a whole number.
   b. Horizontal control points on plans, including survey centerline, baseline, intersections and alignment - in feet to 2 decimal places.
   c. Vertical alignment control points, (PVC, PVI, PVT) and profile grade elevations - in feet to 2 decimal places.
   d. Profile Grade - in percent to 3 decimal places.
   e. Proposed flow lines - in feet to 2 decimal places.
   f. Manhole tops and grate elevations - in feet to 2 decimal places.
   g. Ditch elevations - in feet to 1 decimal place (to nearest 0.05 when controlled by percent of grade).
   h. Box or Three-sided Culvert Spans and Heights - (Show feet as a whole number using the span by height format: e.g., 10 x 6 means the span is 10 feet and the height is 6 feet): In feet as a whole number for new construction; in feet to 2 decimal places for extensions of existing box culverts.

2. Display alignment bearings, degree of curve and delta angles for curve data in degrees, minutes and seconds, rounded to the nearest second.

3. Express slope ratios in vertical to horizontal (V:H) format. For example, show roadside slopes as 1:6, 1:4, etc.
1.3.1 Converting from Metric to English

1. When converting metric values related to surveys, right of way and other geometric alignment use the U.S. Survey Foot taken to a minimum of 8 decimal places:

\[
1 \text{ foot} = \frac{12 \text{ inches/foot}}{39.37 \text{ inches/meter}} = 0.30480061 \text{ meters}
\]

For other direct mathematical conversions use the SI definition: 1 foot = 0.3048 meters

2. Display direct mathematical (soft) converted values to 2 decimal places.

3. On resurfacing projects where the original construction was done in metric, hard convert typical section dimensions (lane widths, shoulder widths, etc.) where existing conditions permit.

Use direct mathematical (soft) conversion for existing pavement widths in curbed sections, existing right of way widths, and existing median widths.

Further information that may be useful in the converting Metric to English may be found in Appendix A of this volume.
1.4 Base Sheet Format

All plan sheet formats are contained in the FDOT Engineering/CADD Systems Software. Sheet borders include a place for the Financial Project ID. For those projects that still have a State Project Number, the number must be added to each sheet in the plans. A separate cell is available for placement above the Financial Project ID as shown below:

Figure 1.1 Project Information Block

```
STATE PROJECT NO.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO. COUNTY FINANCIAL PROJECT ID
```

The blank space immediately left of the box for Financial Project ID information is provided for the Engineer of Record information as required in Section 19.2, Volume I.

Contract plans shall be plotted to scale on size B (11" X 17") multipurpose paper. These plots are to be generated from image files in accordance with the CADD Manual, Section 3.8.3. Care must be taken in setting up plotting equipment and software to center the sheet border and provide a minimum 3/4" margin at each end of the sheet. This is necessary to maintain plan sheet scales and to facilitate the reproduction process used for providing contract plan sets for advertisement and construction.

Sheets that feature grids (cross sections, plan-profile, etc.) can be plotted with minor grid lines turned off or on. If the minor grids are plotted, they are to be half-toned. The FDOT Engineering/CADD System Software provides Microstation system plot drivers for this task. Pen tables for half-toning, using CAD Net plotting, are also available from the FDOT Engineering/CADD Systems Office.

No aerial photography of any type is permitted in final contract plans.
1.5 Plan Notes

Plan notes are intended to be used to clarify design detail, construction practices or method for payment. In general, plan notes should be kept to a minimum. Only those notes that are job specific should be used. Plan notes should only be used to detail uniqueness and not to broaden or curtail requirements in the specifications. Notes that restate the standard specifications or standard indexes shall not be used. This will help to place proper emphasis on those notes that are job specific and avoid discrepancy of documents.
Chapter 2

Sequence of Plans Preparation

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STORMWATER POLLUTION PREVENTION PLANS (SWPPP)
Narrative Description (with supplemental topographic maps, when used)

TRAFFIC CONTROL PLANS
Preliminary traffic control plan
Detour plan
Phasing plan
R/W - existing and additional if required
Existing Utilities

UTILITY ADJUSTMENT
All existing utilities highlighted

SELECTIVE CLEARING AND GRUBBING
Limits of construction by station and type of selective clearing and grubbing

MITIGATION PLANS
Project Specific

MISCELLANEOUS STRUCTURES PLANS
Retaining walls (Cast in place, proprietary, temporary) if required

SIGNING AND PAVEMENT MARKING PLANS - KEY SHEET
Financial Project ID
(Federal Funds) notation, if applicable
State Road Number
County Name
FDOT Project Manager's Name
Begin/end stations & exceptions
Station Equations (if location map is shown)
Engineer of Record
Consultants name & address, if applicable

SIGNING AND PAVEMENT MARKING PLANS - TABULATION OF QUANTITIES
Project Specific

SIGNING AND PAVEMENT MARKING PLANS - PLAN SHEETS
North arrow and scale
Basic Roadway Geometrics
Begin/End Stations and Exceptions
Station equations
Conflicting utilities, lighting or drainage
Pavement markings
Sign locations
Applicable pay items

SIGNING AND PAVEMENT MARKING PLANS - SIGN DETAIL SHEETS
GUIDE SIGN WORK SHEETS
Project Specific
SIGNALIZATION PLANS - KEY SHEET
Financial Project ID
(Federal Funds) notation, if applicable
State Road Number
County Name
FDOT Project Manager's Name
Begin/end stations & exceptions
Station Equations (if location map is shown)
Engineer of Record
Consultants name & address, if applicable

SIGNALIZATION PLANS - TABULATION OF QUANTITIES
Project Specific

SIGNALIZATION PLANS - PLAN SHEET
North arrow and scale
Basic Roadway Geometrics
Begin/End Stations and Exceptions
Station Equations
Conflicting utilities, lighting or drainage
Signal Pole Location
Type and location of loops
Type and location of signal heads
Pedestrian Signal
Location of Stop Bars
Location of Pedestrian Crosswalks
Sheet Title
Applicable pay items

SIGNALIZATION PLANS - POLE SCHEDULE
Pole location, number, type
Pole dimensions
Pay item number and quantity
Joint use pole details, if applicable
Foundation design

SIGNALIZATION PLANS - INTERCONNECT/COMMUNICATION CABLE PLAN
Placement of interconnect/communication cable
Conflicting utilities, lighting or drainage
Other project specific details

ITS PLANS - KEY SHEET
Financial Project ID
(Federal Funds) notation, if applicable
State Road Number
County Name
FDOT Project Manager's Name
Begin/end stations & exceptions
Station Equations (if location map is shown)
Engineer of Record
Consultants name & address, if applicable

ITS PLANS - TABULATION OF QUANTITIES
Project Specific

ITS PLANS - PLAN SHEETS
Project Specific, but must include:
North arrow and scale
Basic Roadway Geometrics
Begin/End Stations and Exceptions
Station equations
Conflicting utilities, lighting or drainage
Applicable pay items

ITS PLANS - DETAIL SHEETS
Project Specific
LIGHTING PLANS - KEY SHEET
Financial Project ID
(Federal Funds) notation, if applicable
State Road Number
County Name
FDOT Project Manager's Name
Begin/end stations & exceptions
Station Equations (if location map is shown)
Engineer of Record
Consultants name & address, if applicable

LIGHTING PLANS - TABULATION OF QUANTITIES
Project Specific

LIGHTING PLANS - POLE DATA AND LEGEND SHEET
Each pole by number with location, arm length, mounting height and luminaire wattage noted.
Design value for light intensities and uniformity ratios shown.
Legend and sheet title

LIGHTING PLANS - PLAN SHEETS
North arrow and scale
Basic Roadway Geometrics
Begin/End Stations and Equations
Station Equations
Conflicting utilities, drainage, signal poles, etc.
Sheet title
Applicable pay items
Pole symbols shown at correct station location and approximate offset

LIGHTING PLANS - HIGH MAST
Foundation detail sheets (project specific)
Boring data sheets (project specific)
Conflicting utilities, drainage, lighting

LANDSCAPE PLANS - KEY SHEET
Financial Project ID
(Federal Funds) notation, if applicable
Fiscal year and sheet number
State Road Number
County Name
FDOT Project Manager's Name
Begin/end stations & exceptions
Station Equations (if location map is shown)
Landscape Architect of Record name and registration number
Consultants name, address, and contract number, if applicable
Index of landscape plans

LANDSCAPE PLANS - TABULATION OF QUANTITIES AND PLANT SCHEDULE
Project Specific

LANDSCAPE PLANS - TABULATION OF QUANTITIES AND SCHEDULE FOR IRRIGATION AND SITE AMENITIES
Project Specific
**LANDSCAPE PLANS – PLANTING PLAN SHEETS**
- Project centerline
- Edge of pavement (edge of traffic lanes)
- Curbs or curb and gutter
- Drainage systems
- Guardrails
- Right of way and/or limited access fence line
- Sidewalks or other planned or existing structures
- Lighting, signs, and signal poles
- Intersections and driveways which are noted in the plans
- Existing and proposed overhead and underground utility locations
- Clear Zone/Horizontal clearance (should be plotted or safety setback distances noted frequently on each plan sheet)
- View zones for permitted outdoor advertising signs
- Canopy limits
- Existing vegetation (to remain or be removed)
- Existing off site features and conditions that affect or are affected by the project
- Fence and gate locations
- Setbacks from structural elements or drainage system
- Limits of clear sight
- Transit facilities
- Proposed Planting Plan (Plant symbols and Plant quantities)

**LANDSCAPE PLANS - IRRIGATION PLAN SHEETS**
(if applicable)
- Type of system
- Location and size of mainlines and lateral lines
- Type and location of spray heads and rotors
- Type and location of valves, sleeves, controllers, water sources/point of connection, backflow preventers, and isolation valves

**LANDSCAPE PLANS – DETAILS SHEET**
Applicable landscape details
- Irrigation symbology with associative descriptions
(if applicable)
2.3.2.3 Phase III Plans Submittal

Ordinarily, the only other remaining work to be done will be to comply with comments received as a result of the review. The Work Zone Traffic Control items paid for on a 'per day' basis shall be estimated and included in the Phase III submittal.

The FDOT construction department will make a biddability review and will establish construction duration as a part of the Phase III review after receiving the computation book. This information should be included in the Phase III review comments transmitted back to the EOR. The estimated pay items for Work Zone Traffic Control shall be revised as necessary based on the established construction duration.

All plan sheets and computation books are complete and the Financial Management (FM) system has been updated. Final drainage tabulations shall also be furnished for review.

Utility Joint Participation Agreement (JPA) Plans, consisting or a key sheet, and mainline plan-profile showing proposed utility horizontal and vertical locations, are also to be included in the Phase III submittal.

A "marked up" set of the plans and review comments shall be returned to the EOR for incorporation of the comments into the plans. When the review comments have been resolved and documented by the designer, the plans are ready to proceed to completion.

2.3.2.4 Phase IV Plans Submittal

After all corrections noted in the Phase III submittal are complete and the cost estimate is complete, the plans are considered final.
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3.6 Index of Sheets

A complete index of roadway plan sheets shall be placed on the left side of the key sheet under the heading. When projects contain component plans, each plans set shall have an index of sheets on its respective key sheet.

Roadway plans sheets shall be assembled as follows:

1. Key Sheet
2. Summary of Pay Items
3. Drainage Map (optional)
4. Interchange Drainage Map
5. Typical Section
6. Summary of Quantities
7. Box Culvert Data Sheet (if PSTDN55 design)
8. Summary of Drainage Structures
9. Optional Materials Tabulation
10. Project Layout (optional)
11. Roadway Plan-Profiles
12. Special Profiles
14. Interchange Layout
15. Ramp Terminal Details
16. Intersection Layout/Detail
17. Drainage Structures
18. Three-Sided/Box Culvert Details (if LRFD design)
19. Outfall/Lateral Ditch Plan-Profiles
20. Outfall/Lateral Ditch Cross Sections
21. Special Details
22. Cross Section Pattern
23. Roadway Soil Survey
24. Cross Sections
25. Stormwater Pollution Prevention Plans (SWPPP)
26. Traffic Control Plans
27. Utility Adjustments
28. Selective Clearing and Grubbing
29. Signing and Pavement Marking Plans*
30. Signalization Plans*
31. ITS Plans*
32. Lighting Plans*
33. Landscape Plans*
34. Mitigation Plans
35. Miscellaneous Structures Plans
   * When not separate component plans.

In addition, the roadway plans may contain sheets which were prepared separately (perhaps by a sub-consultant) and incorporated into the roadway plans early in the design process. These sheets will appear at the end of the numbered sequence of the roadway plans and must be identified with the following prefixes:

GR-# Soil Survey and Report of Core Borings normally associated with the roadway plans set (including miscellaneous structures but excluding bridges and walls)
CTL-# Project Survey Control Sheets
TR-# Tree Survey Sheets
UTV-# Verified Utility Locate Sheets
3.7 Professional Responsibility

The name of the Engineer of Record, Architect or Landscape Architect of Record and registration number shall be included on the right side of the sheet. For specific instructions on sealing plans see Volume I, Chapter 19.

For plans prepared by a consulting firm, the name, address, consultant contract number, certificate of authorization number and vendor number of the firm shall be shown on the right side of the sheet.

The Department Project Manager's name shall be shown below the length of project box for consultant and Department prepared plans. For key sheets where length of project is not required, the Department Project Manager's name shall be shown in the same relative location on the sheet.

If shop drawings are anticipated for a project, the name(s) and address(es) of the Delegated Engineer(s) for shop drawing review(s) shall be shown on the right side of the sheet.
3.8 Governing Specifications and Standards

The date of the governing *Standard Specifications for Road and Bridge Construction* and of the *Design Standards* shall be inserted in a note at the lower left corner of the lead key sheet of each plan set.

A document entitled *Design Standards Modifications* includes a listing of all Interim Design Standards issued since publication of the applicable booklet, plus all changes and corrections to notes and text within the booklet that do not warrant the issuance of Interim Indexes (previously handled by Special Provision). The Design Standards Modifications documents will be dated, and posted on the same web site as the Design Standards. The Design Standards Modifications will typically be updated and posted in January and July, 6 months prior to the effective letting date. For example, *Design Standards Modifications* dated July 1, 2005 will be posted on the web site in January 2005, but will be effective beginning with the July 2005 letting. Special updates to the Design Standards Modifications posted in between January and July will only be issued when necessary to address changes of immediate concern. When this occurs, email notification will be sent to the Districts and registered Plans Preparation Manual holders.

The applicable Design Standards Modifications and date, and Internet address shall be shown on the lower left corner of the lead key sheet of each plan set, below the Governing Specifications and Standards note, and above the Revisions area. Note that all Interim Indexes listed in the Design Standards Modifications document will be applicable. *Interim Standards* shall not be attached to the Contract Plans Set.

The Governing Specifications and Standards note and the Design Standards Modifications note shall not be shown on the key sheets of component plans that are listed on the lead key sheet of each plan set. *Exhibit KS-1* gives an example on how these notes are shown.

3.9 State Map

A small-scale state map shall be shown at the upper right portion of the key sheet. The location of the project shall be indicated thereon.
3.10 Railroad Crossing

The location of any railroad crossing within the limits of construction will be identified on the key sheet as follows: DOT/AAR crossing number, railroad milepost, name of railroad, and the highway project station number.

3.11 Revisions

The lead key sheet (usually roadway) shall show a complete record of all plans revisions. The component (such as roadway, structures, signing and pavement marking), the sheet numbers involved, and the date when the sheet was revised shall be listed. The unique numbered symbol that corresponds to the Revision Number on the Revision Memo and modified sheets shall be listed here as well.

A newly sealed lead key sheet is required when any sheet is revised.

Revisions shall be shown on the lower left corner of the key sheet in the “Revisions” area. Revisions to strung project sheets shall be listed here, under the respective Financial Project ID.

A Key Sheet Revisions Block shall be shown on the right side of each component key sheet that shall contain a record of all revisions particular to that sheet. It shall list the revision date and a brief description of the revision.

If the changes to a key sheet only involve notes in the Revisions area, no entry is made in the Key Sheet Revisions Block at the lower right corner. The Key Sheet Revisions Block is only used to record changes other than revisions notes.
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

FINANCIAL PROJECT ID 000001-1-52-01 (FEDERAL FUNDS)
BAY COUNTY (46001)
STATE ROAD NO. 220

LENGTH OF PROJECT

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APPENDABLE DESIGN STANDARDS MODIFICATIONS 1-1-07

FOR DESIGN STANDARDS MODIFICATIONS SEE "DESIGN SPECIFICATIONS" OF THE SHEET AND SHEET TITLE:
http://www.dot.state.fl.us/46001c.htm

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SIGNING AND PAVEMENT MARKING PLANS

ROADWAY PLANS

COMPONENTS OF CONTRACT PLANS SET

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT.

INDEX OF ROADWAY PLANS

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GOVERNING STANDARDS AND SPECIFICATIONS:

FLORIDA DEPARTMENT OF TRANSPORTATION DESIGN STANDARDS DATED 2006, AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 2006, AS AMENDED BY CONTRACT DOCUMENTS.

APPENDABLE DESIGN STANDARDS MODIFICATIONS 1-1-07

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TYPICAL SECTION
SR 10 (U.S. 90-A)
STA. 10+00.00 TO STA. 267+34.89

NEW CONSTRUCTION

OPTIONAL BASE GROUP B WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (RUBBER)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP I WITH
FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (RUBBER)

FOR STANDARD TYPICAL SECTION NOTES
REFER TO EXHIBIT 6-I, THIS CHAPTER.

TRAFFIC DATA
CURRENT YEAR = 1998 AADT = 6800
ESTIMATED OPENING YEAR = 2000 AADT = 7600
ESTIMATED DESIGN YEAR = 2000 AADT = 10000
K = 4%, D = 50%, T = 89, 104 KPH
DESIGN HOUR T = 2%
DESIGN SPEED = 45 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR
CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.
POSTED SPEED (MPH) IS OPTIONAL.

NOTE: HEIGHT OF FILL IS THE VERTICAL DISTANCE
FROM THE EDGE OF THE OUTSIDE TRAVEL LANE
TO TOE OF FRONT SLOPE.

SHOULDER PAVEMENT DETAIL

EXHIBIT TYP-1
Date: 1/1/07

FOR STANDARD TYPICAL SECTION NOTES
REFER TO EXHIBIT 6-I, THIS CHAPTER.
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### TRAFFIC DATA

- Depth and width vary see cross sections
- For standard typical section notes refer to Exhibit 6-4, this chapter.

### TYPICAL SECTION

**SR 500**

*STA. 63+65.42 TO STA. 328+65.14*

**NEW CONSTRUCTION**

- Optional Base Group 9 with
  - Type SP Structural Course (Traffic D) (2") (PG 76-22)
  - Friction Course FC-5 (3/4") (PG 76-22)

- Shoulder Pavement
  - Optional Base Group 1 with
    - Type SP Structural Course (Traffic D) (1 1/2") (PG 76-22)
    - Friction Course FC-5 (3/4") (PG 76-22)

**SHOULDER PAVEMENT DETAIL**

**EXHIBIT TYP-2**

*NOTE:* Height of fill is the vertical distance from the edge of the outside travel lane to toe of front slope.
TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 20819
ESTIMATED OPENING YEAR = 2003 AADT = 24100
ESTIMATED DESIGN YEAR = 2023 AADT = 24900
K = 9%
D = 60%
T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 40 MPH

TYPICAL SECTION
SR 00 (MATTHEWS STREET)
STA. 202+42.00 TO STA. 263+29.68
NEW CONSTRUCTION

OPTIONAL BASE GROUP 8 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 1/2")
AND FRICTION COURSE FC-12.5 (TRAFFIC B) (1 1/2") (RUBBER)

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.
POSTED SPEED (MPH) IS OPTIONAL.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-4, THIS CHAPTER.
TYPICAL SECTION
SR 00 (WILSON STREET)
STA. 98+40.00 TO STA. 202+33.00

NEW CONSTRUCTION
OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1½")
AND FRICTION COURSE FC-12.5 (TRAFFIC B) (1½") (RUBBER)

TRAFFIC DATA
CURRENT YEAR = 1998 AADT = 22800
ESTIMATED OPENING YEAR = 2000 AADT = 25800
ESTIMATED DESIGN YEAR = 2020 AADT = 30600
K = 6%  D = 55%  T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 45 MPH

TRAFFIC DATA IS REQUIRED TO BE
NOTED FOR CURRENT YEAR, OPENING
YEAR AND DESIGN YEAR.
POSTED SPEED (MPH) IS OPTIONAL.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION

EXHIBIT TYP-5
Dated 1/1/07
DESIGNATED BIKE LAKES SHALL BE LABELED ON TYPICAL. UNDESIGNATED BIKE LAKES SHOULD NOT BE LABELED ON TYPICAL.

** IF LIMITS OF CONSTRUCTION EXCEED RIGHT OF WAY, A PROPERTY AGREEMENT IS REQUIRED.

6-LANE ARTERIAL NEW CONSTRUCTION DIVIDED URBAN WITH DESIGNATED OR UNDESIGNATED BIKE LANE DESIGN SPEED 45 MPH OR LESS

LIMITS OF CONSTRUCTION

STANDARD CLEARING AND GRUBBING

LIMITS OF CONSTRUCTION

TYPICAL SECTION

SR 00 (JACKSON STREET)

STA. 101+21.00 TO STA. 221+44.00

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH

TYPE SP STRUCTURAL COURSE (TRAFFIC C) (12")

AND FRICTION COURSE FC-125 (TRAFFIC C) (1/2") (RUBBER)

TYPICAL SECTION

SR 00 (JACKSON STREET)

STA. 101+21.00 TO STA. 221+44.00

CURRENT YEAR = 1998 AADT = 22800

ESTIMATED OPENING YEAR = 2000 AADT = 25800

ESTIMATED DESIGN YEAR = 2020 AADT = 30600

K = .6% D = 55% T = 2% (24 HOUR)

DESIGN HOUR T = 1%

DESIGN SPEED = 45 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

REVISIONS

EXHIBIT TYP-6

DATE 1/1/07

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

FINANCIAL PROJECT ID

TYPICAL SECTION

rd960jf
TYPICAL SECTION
SR 00 (JACKSON STREET)
STA. 101+21.00 TO STA. 221+44.00
NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 (TYPE 6-12.5 ONLY), WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (3")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (RUBBER)

TRAFFIC DATA
CURRENT YEAR = 1998 AADT = 22800
ESTIMATED OPENING YEAR = 2000 AADT = 25800
ESTIMATED DESIGN YEAR = 2020 AADT = 30600
K = 6%; D = 55%; T = 8% (14 hour)
DESIGN HOUR T = 1%
DESIGN SPEED = 45 MPH

FOR STANDARD TYPICAL SECTION NOTES
REFER TO EXHIBIT 6-I, THIS CHAPTER

TRAFFIC DATA IS REQUIRED TO BE
NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

EXHIBIT TYP-6A
Date 1/1/07
TRAFFIC DATA

STA. 10+53.00 TO STA. 130+77.00

CURRENT YEAR = 1998 AADT = 9670
ESTIMATED OPENING YEAR = 2000 AADT = 15000
ESTIMATED DESIGN YEAR = 2000 AADT = 20200
K = 10%  D = 60%  T = 7% (24 HOUR)
DESIGN HOUR T = 3%
DESIGN SPEED = 55 MPH

STA. 206+82.28 TO STA. 368+41.21

CURRENT YEAR = 1998 AADT = 6835
ESTIMATED OPENING YEAR = 2000 AADT = 8600
ESTIMATED DESIGN YEAR = 2000 AADT = 15100
K = 10%  D = 65%  T = 7% (24 HOUR)
DESIGN HOUR T = 3%
DESIGN SPEED = 55 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

TYPICAL SECTION

SR 00

STA. 10+53.00 TO STA. 130+77.00
STA. 206+82.28 TO STA. 368+41.21

MILLING

MILL EXISTING ASPHALT PAVEMENT (2" AVG. DEPTH)

RESURFACING

TYPE SP STRUCTURAL COURSE (TRAFFIC B) (2")
AND FRICTION COURSE FC-9,5 (TRAFFIC B) (1") (RUBBER)

SHOULDER PAVEMENT RESURFACING

FRICTION COURSE FC-9,5 (TRAFFIC B) (1") (RUBBER)

EXISTING 2-LANE (2-WAY)
ARTERIAL/COLLECTOR
MILLING AND RESURFACING
NO CROSS SLOPE
CORRECTION REQUIRED
UNDIVIDED
RURAL
(WITH DESIGNATED OR
UNDISEIGNATED BIKE LANE
EXISTING)
WITH PROJECTED 20 YR.
AADT OF 1500 OR GREATER

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

SOME PROJECTS MAY REQUIRE SHOULDER WORK, WHEN REQUIRED THIS SHOULD BE IDENTIFIED ON THE TYPICAL SECTION SHEET.
TRAFFIC DATA

**STA. 20+25.00 TO STA. 48+16.56**
- **CURRENT YEAR** = 1998 AADT = 6835
- **ESTIMATED OPENING YEAR** = 2000 AADT = 8600
- **ESTIMATED DESIGN YEAR** = 2020 AADT = 17200
- **K** = 10%, **D** = 65%, **T** = 7% (24 HOUR)
- **DESIGN HOUR T** = 3%  
- **DESIGN SPEED** = 55 MPH

**STA. 57+82.78 TO STA. 93+41.21**
- **CURRENT YEAR** = 1998 AADT = 8700
- **ESTIMATED OPENING YEAR** = 2000 AADT = 9200
- **ESTIMATED DESIGN YEAR** = 2020 AADT = 23600
- **K** = 10%, **D** = 56%, **T** = 5% (24 HOUR)
- **DESIGN HOUR T** = 3%  
- **DESIGN SPEED** = 55 MPH

**TYPICAL SECTION**

**STA. 20+25.00 TO STA. 48+16.56**
- **MILLING**
  - MILL EXISTING ASPHALT PAVEMENT (2" AVG. DEPTH)

**STA. 57+82.78 TO STA. 93+41.21**
- **RESURFACING**
  - TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1 1/2")  
  - AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (RUBBER)
- **WIDENING**
  - OPTIONAL BASE GROUP 11 WITH
    - TYPE SP STRUCTURAL COURSE (TRAFFIC C) (3")  
    - AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1/2") (RUBBER)
  - TYPE B STABILIZATION
    - LABELED ON TYPICAL.
    - UNDESIGNATED BIKE LANES SHOULD NOT BE LABELED ON TYPICAL.
  - DESIGNATED BIKE LINES SHALL BE LABELED.

**LIMITS OF CONSTRUCTION**
- STANDARD CLEARING AND GRUBBING
- 8'  

**HORIZONTAL LIMITS**
-自然地面
- 1:6 FOR FILLS TO 5'
- 1:6 TO EDGE OF CLEAR ZONE & 1:4 FOR FILLS 5' TO 10'
- 1:6 TO EDGE OF CLEAR ZONE & 1:3 FOR FILLS 10' TO 20'
- 1:2 (WITH GUARDRAIL) FILLS OVER 20'
- 2'-8" SOD TREATMENT (INDEX 105)
- 2'-8" SOD TREATMENT (INDEX 105)
- 2' MIN. TURF
- TYPICAL 20'

**NOTE**
- HEIGHT OF FILL IS THE VERTICAL DISTANCE FROM THE EDGE OF THE OUTSIDE TRAVEL LANE TO TOE OF FRONT SLOPE.
- FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

**EXHIBIT TYP-B**
- Date 1/1/07

**SHEET 1 OF 2**
The need for stabilization in the shoulder area on RRR projects is site specific and not always required. The use of stabilizing in narrow trench widening strips is not recommended generally. See the Flexible Pavement Design Manual for further criteria.

Designated bike lanes shall be labeled on typical. Undesignated bike lanes should not be labeled on typical.

For standard typical section notes refer to Exhibit 6-1, this chapter.

Note: actual width of base widening may vary due to actual pavement width. Contractor may elect to place uniform base widening at no additional cost.
TYPICAL SECTION
SR 500
STA. 204+34.58 TO STA. 288+95.16

WILLING
MILL EXISTING ASPHALT PAVEMENT (6") AVG. DEPTH

RESURFACING
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (6") (PG 76-22)
AND FRICTION COURSE FC-5 (1") (PG 76-22)

SHOULDER PAVEMENT
OPTIONAL BASE GROUP 1
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (6") (PG 76-22)
AND FRICTION COURSE FC-5 (1") (PG 76-22)

OVERBUILD
TYPE SP OVERBUILD (TRAFFIC D) THICKNESS VARIES (1" TO 1.5")

RESURFACING
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (6") (PG 76-22)
AND FRICTION COURSE FC-5 (1") (PG 76-22)

SHOULDER PAVEMENT
OPTIONAL BASE GROUP 1
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (6") (PG 76-22)
AND FRICTION COURSE FC-5 (1") (PG 76-22)

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR, AND DESIGN YEAR, POSTED SPEED (MPH) IS OPTIONAL.

*NOTES:
HEIGHT OF FILL IS THE VERTICAL DISTANCE FROM THE EDGE OF THE OUTSIDE TRAVEL LANE TO TOE OF FRONT SLOPE.

7' THE AREA DISTURBED BY CONSTRUCTION VARIES.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-4, THIS CHAPTER.

FOR WILLING AND RESURFACING DETAILS SEE TYPICAL SECTION DETAILS SHEET 2 AND 3

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION

REVISIONS
DATE | BY | DESCRIPTION
--- | --- | ---

EXHIBIT TYP-9
Date: 1/1/07
SHEET 1 OF 3

CONSTRUCTION CONSIDERATIONS

- Natural Ground
- Existing Roadway Pavement
- Cross Slope 0.015 ~
- R/W LINE
- 4 LANE ARTICULATED COLLECTOR
- MILLING & RESURFACING CROSS SLOPE CORRECTION BY MILLING OR OVERBUILD CORR XS. S SILL, PARTLY DIVIDED RURAL.
- DAMAGE IMPROVEMENTS SAFETY IMPROVEMENTS WITH DESIGNATED OR UNDESIGNATED BIKE LANE WITH PROJECTED 60 MPH AADT OR GREATER.
- DESIGN SPEED 45 MPH OR GREATER.
- MILL EXISTING ASPHALT PAVEMENT (1 1/2 " AVG. DEPTH)
- TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ")
- TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ") (PG 76-22)
- AND FRICTION COURSE FC-5 ( 3/4 ")(PG 76-22)
- OPTIONAL BASE GROUP 1 WITH TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ")(PG 76-22)
- AND FRICTION COURSE FC-5 ( 3/4 ")(PG 76-22)
- MILL EXISTING ASPHALT PAVEMENT (1 1/2"
- TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ")(PG 76-22)
- AND FRICTION COURSE FC-5 ( 3/4 ")(PG 76-22)
- OPTIONAL BASE GROUP 1 WITH TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ")(PG 76-22)
- AND FRICTION COURSE FC-5 ( 3/4 ")(PG 76-22)
- MILL EXISTING ASPHALT PAVEMENT (1 1/2 ")
- TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ")(PG 76-22)
- AND FRICTION COURSE FC-5 ( 3/4 ")(PG 76-22)
- OPTIONAL BASE GROUP 1 WITH TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2 ")(PG 76-22)
- AND FRICTION COURSE FC-5 ( 3/4 ")(PG 76-22)
WHEN CROSS SLOPE CORRECTION IS NECESSARY SPECIAL MILLING AND LAYERING DETAILS MUST BE PROVIDED TO SUPPLEMENT TYPICAL SECTION. THE NEED FOR AND LOCATION OF PROFILE GRADE POINTS WILL DEPEND ON SITE SPECIFIC CONDITIONS.

EXAMPLE OF CROSS SLOPE CORRECTION BY MILLING.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.
WHEN CROSS SLOPE CORRECTION IS NECESSARY, SPECIAL MILLING, OVERBUILD AND LAYERING DETAILS MUST BE PROVIDED TO SUPPLEMENT TYPICAL SECTION. THE NEED FOR AND LOCATION OF PROFILE GRADES POINTS WILL DEPEND ON SITE SPECIFIC CONDITIONS.

EXAMPLE OF CROSS SLOPE CORRECTION BY MILLING AND OVERBUILD.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

SUGGESTED CONSTRUCTION SEQUENCES SHOWN. OTHER SEQUENCES THAT MEET SPECIFICATIONS, THICKNESS AND CROSS SLOPE REQUIREMENTS MAY BE CONSIDERED BY THE ENGINEER.

STA. 316+53.67 TO STA. 527+82.00

EXHIBIT TYP-9B
Date: 1/1/07

SHEET 3 OF 3
TYPICAL SECTION
SR 8
STA. 567+25.67 TO STA. 1056+84.35

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2 1/2")
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2") (PG 76-22) AND
FRICTION COURSE FC-5 (3/4") (PG 76-22)

MEDIAN SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2")
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 1/2") (PG 76-22) AND
FRICTION COURSE FC-5 (3/4") (PG 76-22)

OUTSIDE SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 1/2") AND
FRICTION COURSE FC-5 (3/4") (PG 76-22)

NOTE:
HEIGHT OF FILL IS THE VERTICAL DISTANCE
FROM THE EDGE OF THE OUTSIDE TRAVEL LANE
TO TOE OF FRONT SLOPE.

4 LANE
INTERSTATE SYSTEM
NEW CONSTRUCTION
DIVIDED
RURAL
WITH PROJECTED
20 YR. AADT OF 1500
OR GREATER
DESIGN SPEED
70 MPH

TURF
TURF
TURF

Date: 1/1/07
EXHIBIT TYP-10

TRAFFIC DATA
CURRENT YEAR = 1998   AADT = 22300
ESTIMATED OPENING YEAR = 2000   AADT = 23300
ESTIMATED DESIGN YEAR = 2020   AADT = 51500
K = 9   %  D = 56   %  T = 9   % (24 HOUR)
DESIGN HOUR T = 5   %
DESIGN SPEED = 70   MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR
CURRENT YEAR, OPENING YEAR, AND DESIGN YEAR.
POSTED SPEED (MPH) IS OPTIONAL.

FOR STANDARD TYPICAL SECTION NOTES
REFER TO EXHIBIT 6-I, THIS CHAPTER

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
FINANCIAL PROJECT NO.

TYPICAL SECTION

REVISIONS

SHEET NO.

DATE

NO.

DESCRIPTION

DATE

NO.

DESCRIPTION

0.02
0.02
0.06
0.05
0.05
0.06
0.06
0.05
**TYPE B STABILIZATION**

**LBR 40**

**NEW CONSTRUCTION**

**TYPE A FENCE**

**PROFILE GRADE POINT**

**SELECTIVE CLEARING AND GRUBBING**

"Y" LIMITS OF CONSTRUCTION

STANDARD CLEARING AND GRUBBING

0.05

0.06

0.02

0.02

0.06

EXHIBIT TYP-11

15'

3.5'

"Y" THE AREA DISTURBED BY CONSTRUCTION VARIES.

LIMITS OF CONSTRUCTION

**SHOULDER PAVEMENT & SHOULDER GUTTER DETAIL**

FOR SINGLE LANE RAMP

**TYPICAL SECTION**

RAMP "B"

STA. 415+67.28 TO STA. 421+23.68

(SINGLE LANE RAMP)

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2 1/2") (PG 76-22) AND FRICITION COURSE FC-5 (3/4") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2 1/2") (PG 76-22) AND FRICITION COURSE FC-5 (3/4") (PG 76-22)

SHOULDER PAVEMENT & SHOULDER GUTTER DETAIL FOR SINGLE LANE RAMP

EXHIBIT TYP-II

Date: 1/1/07

NOTE:

HEIGHT OF FILL IS THE VERTICAL DISTANCE FROM THE EDGE OF THE OUTSIDE TRAVEL LANE TO TOE OF FRONT SLOPE.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-4, THIS CHAPTER.
NEW CONSTRUCTION

STANDARD CLEARING AND GRUBBING

LIMITS OF CONSTRUCTION

LA R/W LINE

SELECTIVE CLEARING AND GRUBBING

STRAIGHT LIGHT & GUARD

STA.

C & G

TYPICAL SECTION

RAMP "C"

STA. 623+28.64 TO STA. 629+13.78

(TWO LANE RAMP)

LIMITS OF CONSTRUCTION

HEIGHT OF FILL IS THE VERTICAL DISTANCE FROM THE EDGE OF THE OUTSIDE TRAVEL LANE TO TOE OF FRONT SLOPE.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

LEFT SHOULDER PAVEMENT

OPTIONAL BASE GROUP 9 WITH

TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2") (PG 76-22) AND

FRICTION COURSE FC-5 (1/4") (PG 76-22)

RIGHT SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH

TYPE SP STRUCTURAL COURSE (TRAFFIC B) (2") AND

FRICTION COURSE FC-5 (1/4") (PG 76-22)

SHOULDER PAVEMENT & SHOULDER GUTTER DETAIL

MAINLINE AND MULTILANE RAMPS

GUARDRAIL REQUIRED WHEN SLOPES EXCEED 1:3 AND FILL HEIGHTS EXCEED 6'
DESIGNATED BIKE LANES SHALL BE LABELED ON TYPICAL. UNDESIGNATED BIKE LANES SHOULD NOT BE LABELED ON TYPICAL.

IF LANDSCAPING IS DESIRED, TREES SHALL BE TYPES THAT WILL NOT HAVE AN EXPECTED GROWTH GREATER THAN 4" IN DIAMETER MEASURED 6" ABOVE THE GROUND.

TYP SLOPES 1:3 OR FLATTER
* SSD SLOPES STEEPER THAN 1:3

4-LANE MATERIAL
NEW CONSTRUCTION
DIVIDED
SUBURBAN WITH DESIGNATED OR UNDESIGNATED BIKE LANE
DESIGN SPEED 55 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

POSTED SPEED (MPH) IS OPTIONAL.

CURRENT YEAR          = 1999 AADT = 22800
ESTIMATED OPENING YEAR = 2002 AADT = 25800
ESTIMATED DESIGN YEAR  = 2022 AADT = 30600
K = 6%  D = 55%  T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 55 MPH

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

SUBURBAN TYPICAL SECTION
SR 00 (SARA AVE.)
STA. 50+40.00 TO STA. 125+50.00

NEW CONSTRUCTION
OPTIONAL BASE GROUP 9 WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (3 1/2")
AND FRICTION COURSE FC-5 (3/4") (RUBBER)

EXHIBIT TYP-13
Date: 1/1/07
SUBURBAN TYPICAL SECTION

SR 00 (CODY ROAD)
STA. 100+40.00 TO STA. 225+50.00

NEW CONSTRUCTION

TRAFFIC DATA
CURRENT YEAR AADT = 22800
ESTIMATED OPENING YEAR AADT = 25800
ESTIMATED DESIGN YEAR AADT = 30600
K = 6%  D = 55%  T = 12%  T = 2% (24 HOUR)
DESIGN SPEED = 55 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR. POSTED SPEED (MPH) IS OPTIONAL.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

REV. SHEET

8' - 9" STANDARD CLEARING & GRUBBING
12' STANDARD CLEANING & GRUBBING
E CONST.

TURF SLOPES NOT FLATTER THAN 1:3
*SOD SLOPES STEEPER THAN 1:3

EXHIBIT TYP-14
Date 1/1/07

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (3 1/2"
AND FRICTION COURSE FC-5 (3/4") (RUBBER)

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1 1/2"
AND FRICTION COURSE FC-5 (3/4") (RUBBER)

IF LANDSCAPING IS DESIRED, TREES SHALL BE TYPES THAT WILL NOT HAVE AN EXPECTED GROWTH GREATER THAN 4" IN DIAMETER MEASURED 6" ABOVE THE GROUND.

DESIGNATED BIKE LANES SHALL BE LABELED ON TYPICAL. UNDESIGNATED BIKE LANES SHOULD NOT BE LABELED ON TYPICAL.
TYPICAL SECTION

SHARED USE PATH

SR 00 (WILLOW WAY)

STA. 122+00.000 TO STA. 210+65.000

NOTE:

The design speed for shared use paths is 20 mph.

** FOR ROADWAYS WITH CURBS, A MINIMUM SEPARATION OF 5 FEET MEASURED FROM THE OUTSIDE EDGE OF TRAVELED WAY TO THE INSIDE EDGE OF THE SHARED USE PATH SHOULD BE PROVIDED.

OPTIONAL BASE GROUP 1 WITH

TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1")

SLOPE VARIES:

NOT STEEPER THAN 1:2

TYPICAL SECTION

SHARED USE PATH

SR 00 (DEXTON HEIGHTS)

STA. 22+00.000 TO STA. 51+65.000

OPTIONAL BASE GROUP 1 WITH

TYPE SP STRUCTURAL COURSE (TRAFFIC A) (1")

SLOPE VARIES:

NOT STEEPER THAN 1:2

** FOR ROADWAYS WITH FLUSH SHOULDERS, A MINIMUM SEPARATION OF 5 FEET MEASURED FROM THE OUTSIDE EDGE OF SHOULDER TO THE INSIDE EDGE OF THE SHARED USE PATH SHOULD BE PROVIDED.

SOD, TURF, SOIL.
TYPICAL SECTION

SR 00 (SOUTH INDEPENDENCE STREET)
STA. 401+30.00 TO STA. 788+66.00

TRAFFIC DATA
CURRENT YEAR: 1998  AADT = 22800
ESTIMATED OPENING YEAR: 2000  AADT = 25800
ESTIMATED DESIGN YEAR: 2020  AADT = 30600
K = 6%  D = 55%  T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 50 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.
7.3 Box Culvert Data Sheet

The structural design of box culverts may be done by one of two computer programs dependent on the applicable design specification as described in *Chapter 33*.

The first program is the *LRFD Box Culvert Program* and designs the culvert based on the details shown on *Index 289* of the *Design Standards*. When this program is used the Box Culvert Data Table (from the Structures Sitemenu CADD cells) and the Reinforcing Bar List shall be completed and placed on normally formatted plan sheets. These sheets should be placed together, behind the drainage structure sheets in the contract plans.

The second program is *PSTDN55* and designs the culvert based on the details shown on *Index 290* of the *Design Standards* using Load Factor Design (LFD). When this program is used the program output (data sheets) showing the concrete and steel quantities shall be transferred to a graphics design file and placed on a normally formatted plan sheet. The plan sheet shall be placed in the contract plans directly behind the Summary of Quantities Sheet(s).
THIS PAGE LEFT BLANK INTENTIONALLY
Below are standard notes that should be used on the summary of quantities sheet, as applicable:

(Under Summary of Earthwork):

Earthwork has been calculated using the ______ base option. If another option is constructed, there shall be no revision to the earthwork quantities for which payment is made by plan quantity.

Pay Item Notes

1. 102- 1- Includes approximately ______ SY of Temporary Pavement.
2. 104- 13- 1 Based on replacement every 12 months.
3. 110- 86- All salvageable material designated to be delivered by the contractor shall be delivered to:

   (Provide address of nearest FDOT Maintenance Yard.)

(On applicable Utility JPA plans, also include the following note):

All utility infrastructure designated in the utility plans to be salvaged and delivered by the contractor shall be delivered to:

   (Provide applicable Utility/Agency Owner address.)

4. 334- 1 Includes ______ TN for turnouts, connections to existing drives, streets, etc., as directed by the Engineer.
5. 400- 1- 15 Includes ______ CY for miscellaneous construction, as directed by the Engineer.
6. (For new construction projects with Asphalt Base, Type B-12.5 Only):

   520-1-7 or 520-1-10
   Cost of asphalt curb pad and additional curb thickness required to be included in the cost of curb and gutter.
7. 536- 73- (To be used for the removal of existing guardrail when FDOT Maintenance wants materials).

   Existing guardrail to be dismantled and stockpiled within the right of way in areas designated by the Engineer for removal by FDOT maintenance forces.
8. 538-1- This is to include replacement of _____ panels, _____ regular posts and _____ special posts which have been determined to be non-salvageable. Additional posts and panels determined to be non-salvageable during resetting shall be paid for under 538-5 of the Specifications.

9. Temporary Turf: When required by the project design, these items shall be included in the cost of the Performance Turf items (Note: When 570-1-A items are used in the plans, 104-4 (Mowing) shall not be used). A pay item note should show the approximate quantities. For example:
   570-1-1 Includes approximately _____ SY Turf for temporary erosion control.
   570-1-2 Includes approximately _____ SY Sod for temporary erosion control.

10. 639-2-1 Payment shall be based on the linear feet of a single conductor.

11. The following pay item note should be shown in the Roadway Plans:
   710- The totals shown on the Summary of Roadway Pay Items are for painted pavement markings used for Maintenance of Traffic.
## SUMMARY OF SODDING

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<th>W</th>
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<td>W</td>
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## SUMMARY OF SIDEDRAIN & MITERED END SECTIONS

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### SUMMARY OF DITCH PAVEMENT AND SODDING

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**EXHIBIT SQ-2**

**DATE:** 1/1/07

---

*WHEN A PEDESTRIAN SAFETY TREATMENT, AND/OR RUB RAIL TREATMENT, IS TO BE PROVIDED FOR A RUN OF GUARDRAIL, THE BEGINNING AND END STATION IS TO BE NOTED AS SHOWN IN THE SUMMARY OF GUARDRAIL ABOVE. OTHERWISE, THESE COLUMNS MAY BE DELETED.*
### SUMMARY OF EARTHWORK

<table>
<thead>
<tr>
<th>Description</th>
<th>P</th>
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<tbody>
<tr>
<td>ROADWAY EXCAVATION, MAINLINE</td>
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<td>ROADWAY EXCAVATION, ADAMS ST.</td>
<td>900</td>
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<tr>
<td>REGULAR EXCAVATION, POND</td>
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<td>1,005</td>
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<tr>
<td>REGULAR EXCAVATION FROM LATERAL DITCHES</td>
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<tr>
<td>TOTAL REGULAR EXCAVATION</td>
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Earthwork has been calculated using the ________ base option.
If another option is constructed, there shall be no revision to the earthwork quantities for which payment is made by Plan Quantity.

### SUMMARY OF EARTHWORK

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<thead>
<tr>
<th>Description</th>
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<td>FILL, MAINLINE</td>
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<td>FILL, CROSS DRAINS</td>
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<td>SUB-TOTAL FILL</td>
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<td>SUB-TOTAL WITH FILL ADJUSTMENT</td>
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<tr>
<td>TRUCK ADJUSTMENT (25%) (508 x 0.25)</td>
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<td>+127</td>
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<td>TOTAL BORROW EXCAVATION</td>
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FOR PROJECTS WITH CROSS SECTIONS

Adjustment percentages shown are for example only. Contact District Materials Office or Construction for actual percentages to be used for each project.

FOR PROJECTS WITHOUT CROSS SECTIONS

Adjustment percentages shown are for example only. Contact District Materials Office or Construction for actual percentages to be used for each project.
### SUMMARY OF PERMANENT CRASH CUSHIONS

<table>
<thead>
<tr>
<th>STATION</th>
<th>SIDE</th>
<th>DESIGN SPEED</th>
<th>OPTIONS ALLOWED</th>
<th>TRANSITION REQUIRED Y/N</th>
<th>PAY ITEMS</th>
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<td>544-75-40</td>
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<td>100-50</td>
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<td></td>
<td>TAU II</td>
<td></td>
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<td>TRACC</td>
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<th>GUTTER END SECTION</th>
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<th>CLASS I CONC.</th>
<th>CLASS II CONC.</th>
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<th>REINFORCED</th>
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</tbody>
</table>

**STATE OF FLORIDA**

**DEPARTMENT OF TRANSPORTATION**

**SUMMARY OF DRAINAGE STRUCTURES**
2. Adjustment to the bid quantities, prices and payment will not be allowed due to increase or decrease in structure size, shape, length, width, depth or necessary construction to accommodate the use of an optional pipe material other than the "plotted" option. Likewise, there will be no added or reduced compensation for structure alterations required to relieve utility conflicts which arise from the use of an optional material other than the "plotted" option.

3. Adjustment to the bid quantities, prices and payment will not be allowed due to increased or decreased excavation, bedding, borrow, backfilling, compaction, special installation requirements or disposal of excess materials due to use of any of the pipe optional materials. Likewise, adjustment in the quantities, prices and payment will not be allowed due to differences in end treatment size or types, pipe length, alternate jointing and connecting materials, saddles, cradles, filter fabrics, sheltering or similar features due to the use of an optional material other than the "plotted" option.

4. If adjustments are required due to plan errors or omissions or authorized field changes, the "plotted" material and not the material elected by the Contractor would be used to establish new pay quantities.

5. The Contractor shall notify the Department in writing as to which optional pipe materials he chooses to use at the preconstruction conference. Once identified the Contractor may not change pipe material selected without the approval of the Engineer.

6. Pipe shapes other than round (Elliptical/Arch) are summarized and paid for using equivalent round pipe diameter.

This example should be used when pipe flow lines, and/or sizes for individual options are not the same as structure No. 14 or when numerous exceptions occur.
### GENERAL NOTES

1. The Contractor may use any of the optional pipe materials tabulated for a given structure. Only the material options tabulated for a given structure can be used.

2. Adjustment to the bid quantities, prices and payment will not be allowed due to increase or decrease in structure size, shapes, lengths, width, depth or accessory construction necessary to accommodate the use of an optional pipe material other than the "plotted" option. Likewise, there will be no added or reduced compensation for structure alterations required to relieve utility conflicts which arise from the use of an optional material other than the "plotted" option.

3. Adjustment to the bid quantities, prices and payment will not be allowed due to increased or decreased excavation, bedding, borrow, backfilling, compaction, special installation requirements or disposal of excess materials due to use of any of the pipe optional materials. Likewise, adjustment in the quantities, prices and payment will not be allowed due to differences in and treatment size or type, pipe length, alternate jointing and connecting materials, saddles, cradles, filter fabrics, shoring or similar features due to the use of an optional material other than the "plotted" option.

4. If adjustments are required due to plan errors or omissions or authorized field changes, the "plotted" material and not the material selected by the Contractor would be used to establish new pay quantities.

5. The Contractor shall notify the Department in writing as to which optional pipe materials he chooses to use at the preconstruction conference. Once identified the Contractor may not change pipe material selected without the approval of the Engineer.

6. Pipe shapes other than round (Elliptical/Arched) are summarized and paid for using equivalent round pipe diameter.

---

### OPTIONAL MATERIALS TABULATION

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<thead>
<tr>
<th>STRUCTURE</th>
<th>SIZE (INCHES)</th>
<th>MATERIAL</th>
<th>PLOTTED</th>
<th>REMARKS</th>
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<tbody>
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**EXHIBIT SDS-36**

Date: 1/1/07

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**THIS EXAMPLE SHOULD BE USED WHEN MATERIAL OPTIONS ARE THE SAME FOR THE DIFFERENT PIPE SIZES AND WHEN LIMITED EXCEPTIONS ARE NOTED.**
10.2.6  **Drainage Structures and Bridges**

Proposed cross drain pipes and box and three-sided culverts shall be indicated in the plan by a symbol and identified by a drainage structure number. Cross drain pipe sizes and lengths shall be shown. (Box and three-sided culvert lengths shall be shown on the drainage structure sheets).

Box and three-sided culverts (single or multiple) of 20 feet total span or more between inside faces of end supports, measured along the center of the roadway, shall be designated as bridge culverts and shall be identified by both a bridge number and a drainage structure number. The beginning and ending stations (outside wall to outside wall) shall be flagged.

Proposed bridges and approach slabs shall be shown by simple outline. Bridges shall be identified by bridge number and their beginning and ending stations noted by station flags. The beginning and ending stations of approach slabs shall be noted.

A short section of lateral ditch/outfall centerline shall be shown, when appropriate, on the roadway plan-profile sheet, together with a note referring to lateral ditch/outfall sheets for details.

The proposed drainage system is indicated by showing storm sewer pipes with a single line, and the outline of inlets, manholes and junction boxes. The outline of structure bottoms may be shown at the designer’s discretion. The pipe size and length between structures shall be given. Structure numbers shall be provided for inlets, manholes, junction boxes and special structures.

10.2.7  **Plan Layout**

1. Right of way lines shall be shown. Right of way shall be dimensioned only if the applicable typical section shows a varying dimension from the baseline or centerline. Dimensions of the R/W line shall be from the centerline or baseline, if survey and construction lines are parallel; otherwise it shall be dimensioned from the construction centerline.

2. The showing of detailed information regarding median openings or intersections should be avoided when they are of a type that can be detailed and grouped on a separate sheet. When this is the case, median openings and intersections shall be identified by station location.
3. At locations along the alignment where traveled way dimensions change, or begin to change, the station and dimensions of the traveled way shall be shown.

4. Curb, curb and gutter, traffic separators, sidewalks, curb ramps, retaining walls, etc. shall be shown. Driveways shall be shown as required by Volume I, Section 1.8.

5. Stations of return points shall be shown in tabular form or shown on the plan, unless shown on an intersection detail sheet. Offsets shall also be shown, if not governed by a typical.

6. Station of radius points of traffic separator or median curb at median openings shall be shown in the plan. Elevation of these points shall also be shown if not shown in the intersection details sheet or unobtainable in plans.

7. Control radii for traffic turns that set median nose locations shall be indicated, unless shown on the intersection detail sheet.

8. Station of end of curb and gutter at side street intersections (when end is not at a return point) shall be shown with proposed gutter grade elevation of these points.

9. Limits of pavement and grading at side street intersections shall be indicated.

10. When incidental construction extends beyond the right of way lines, construction easements or license agreements may be required and should be shown on the plan sheets.

11. Limits of wetlands shall be shown based on permit or regulatory requirements.

12. All utilities shall be shown in the plan. All major utilities that have been field verified (see Quality Level "A" locates, Volume I, Chapter 5) shall be labeled in accordance with the following symbol:

\[ V_{vh} = \text{Verified Vertical Elevation and Horizontal Location} \]

13. All traffic monitoring sites on or within one-half mile of the project shall be identified with the following notation:

Traffic Monitoring Site Number (XXXX)
Roadway Identifying Number (RCI Section #) Milepost (XX.XXX)

Site includes vehicle detectors in roadway and pedestal, pole or base mounted cabinet, buried cable, and solar power unit on right of way.

Inquiries about monitoring sites should be addressed to the Traffic Data Section Manager of the Transportation Statistics Section, Office of Planning.
Chapter 14

Drainage Structures

14.1 General

Drainage structure sheets show the drainage structures, their location, cross section, flow line elevations of all weirs or slots, top of grates, culverts and top of manhole elevations, and similar data. Drainage structure sheets also show the vertical relationships of the entire drainage system. During the process of design/placement of the drainage structures, potential conflicts with existing or proposed utilities shall be identified and resolved early, thereby avoiding costly time delays during the construction phases.

All projects require the plotting of drainage structures. When only cross drains are to be constructed or modified, drainage structures may be plotted on the cross section sheets. Otherwise drainage structures should be plotted on separate drainage structure sheets, utilizing the cross section sheet cell available in the FDOT Engineering/CADD Systems Software (see Exhibit DS-2). See Chapter 22 for additional requirements for box and three-sided culverts utilized as drainage structures.

14.2 Required Information

The existing ground line for rural projects shall be shown at the location of the structure, with the existing elevation placed immediately below the ground line at the survey baseline. No existing structures shall be shown except those to be incorporated into the proposed drainage system or otherwise modified. These shall be shown and their flow line elevations noted. Where storm sewers run laterally or diagonally across the project, the drawing should show the pipe cover.

The roadway template and proposed structures shall be shown, with the proposed profile grade elevation placed above the grade point. The structure shall be located by station and offset to the centerline of construction. Flow line information shall be provided at each structure and at each culvert end. Structures are to be plotted in detail according to the applicable index of the Design Standards, with walls, grates, tops, pipes, etc. shown.

Cross drain sections shall include the size and length for each proposed structure.
Sections for skewed cross drains shall be depicted along the centerline of the structure. Clear zone distances are to be measured at right angles to the traffic lane for all structures.

All structure locations should be checked and R/W shown where the R/W may have potential impact on construction of a structure.

For each drainage structure, all necessary information shall be shown by note, including, as appropriate: size, end treatment and flow lines, as well as structure, index and station number. The note shall be placed as close to the structure as possible, preferably below the plotted structure. Elevations shall be given for manhole tops, and ditch bottom inlet grates and slots. Grate elevations for shoulder gutter and edge of pavement elevations for curb and gutter inlets shall be shown.

Alternate "G" or other special grate treatment shall be included with the inlet note. Additional details, such as special bedding, 36" manhole rings, etc., shall be indicated. Flow direction arrows shall be shown.

Material options shall be shown on the Optional Materials Tabulation Sheet. (See Exhibits SDS-2a and SDS-3a at the back of Chapter 8 of this volume).

If existing structures are to be filled and/or plugged and are to remain in place, they should be shown in the plans with an appropriate note.

Applicable notes to be shown on the first drainage structure sheet are given in Exhibit 14-1.
DATE OF SURVEY: 2/15/95 - 5/1/95
SURVEY MADE BY: HARTFORD TESTING COMPANY
SUBMITTED BY: LARRY BALLARD, P.E.

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS

SURVEY BEGINS STA: 400+00  SURVEY ENDS STA: 554+00

ROAD NO: S.R. 29  DISTRICT: 3  COUNTY: HOUSTON
FINANCIAL PROJECT ID: 

ORGANIC CONTENT

<table>
<thead>
<tr>
<th>STRATUM NO.</th>
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SIEVE ANALYSIS RESULTS

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<th>NO. OF TESTS</th>
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ATTORBERG LIMITS (%)

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CORROSION TEST RESULTS

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<th>% H.P.</th>
<th>% M.P.</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

EMBANKMENT AND SUBGRADE MATERIAL

- WATER TABLE ENCOUNTERED
- GROUND WATER NOT ENCOUNTERED

The material from Stratum Number 1 is Rock Base under Asphaltic Concrete.

The material from Stratum Number 2 appears satisfactory for use in the embankment when utilized in accordance with Index 505. However, this material is likely to retain excess moisture and be difficult to dry and compact. It should be used in the embankment above the water level existing at the time of construction. This material may not be used in the subgrade portion of the roadbed due to its organic content.

The materials from Stratum Numbers 4 and 5 are plastic materials and shall be removed in accordance with Index 500. They may be placed above the existing water level at the time of construction, to within 4 feet of the proposed base. They should be placed uniformly in the lower portion of the embankment for some distance along the project rather than full depths for short distances.

The material from Stratum Number 7 is Highly Plastic material and shall be removed in accordance with Index 500. It may be used within the project limits as indicated in Index 505 only when excavated within the project limits and is not to be used when obtained from outside the project limits.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

EXHIBIT SS-1
Date: 1/1/97
# Chapter 19

## Temporary Traffic Control Plan

19.1 General ..................................................................................... 19-1

19.2 Required Information................................................................... 19-1

19.3 Levels of Complexity to be Anticipated for Temporary Traffic Control Plans ..................................................................................... 19-2
   19.3.1 Level I ........................................................................... 19-2
   19.3.2 Level II .......................................................................... 19-2
   19.3.3 Level III ......................................................................... 19-3

19.4 Format ....................................................................................... 19-4
Chapter 19

Temporary Traffic Control Plan

19.1 General

A Temporary Traffic Control (TTC) plan will accompany all plans for a construction project. The TTC plan is the final document that summarizes the considerations and investigations made in the development of a comprehensive plan for maintaining traffic through a work zone.

The TTC plan is used to describe the actions to be taken by the contractor to minimize traffic impacts while conveying traffic safely through a work zone. The TTC plans may include, but are not limited to, general notes, phase notes, phase typical sections, phase plan-profile sheets, special details, and temporary cross sections.

19.2 Required Information

Specific temporary traffic control plans are required on all projects. The information provided on the TCP plans may consist of nothing more than notes and references to the Design Standards, Series 600 or may be as elaborate as detailed individual phase layouts using profile sheets and interchange and intersection layout sheets. Information shall be provided to inform the contractor of the following:

1. location of the centerline, pavement edge, curb line, shoulder;
2. placement of temporary pavement markings;
3. lane configurations;
4. locations of work zone signs and any other temporary work zone traffic control devices (including variable message signs, advanced warning arrow panels, barriers, crash cushions, temporary signals, etc.);
5. layouts and placement of channelizing devices;
6. work to be accomplished during the individual phases of construction,
7. lane closures and other restrictions that apply;
8. regulatory speed limits for each phase;
9. project specific requirements such as school zones, railroads, waterborne vessels, etc.
When a project requires more than one phase of construction, the temporary traffic control plans should address each individual phase. MOT quantities should be tabulated by phase in the temporary traffic control plans or shown in the computation book.

19.3 Levels of Complexity to be Anticipated for Temporary Traffic Control Plans

The following guidelines have been developed to assist in determining the level of detail and complexity that may be required for a project.

19.3.1 Level I

Application - Simple projects where method of construction is straightforward. (Examples: RRR, Enhancements, Resurfacing, Minor Widening).

Components of the TTC Plan
1. General Notes (including references to the applicable indexes in the Design Standards)
2. Phase Typical Section(s)
3. Special Details - MINIMAL - where unique situations for the project exist

19.3.2 Level II

Application - Moderately complex Construction projects, such as reconstruction of roadways. (Examples: Urban or rural widening projects, Projects with Diversions or Detours)

Components of the TTC Plan
1. General Notes
2. Phase Notes (including references to the applicable indexes in the Design Standards)
3. Phase Typical Section(s)
4. Detailed plan sheets (when an index in the Design Standards does not apply)
5. Cross Sections as determined necessary (Example: diversions, temporary drainage, temporary bridge structure)
6. Special Details - As necessary for constructability (Example: temporary drainage, slope requirements due to diversions, temporary signalization, railroad work, etc.)
19.3.3 Level III

Application - Complex projects.

Components of the TTC Plan

1. General Notes
2. Phase Notes (including any references to the applicable standard indexes)
3. Phase Typical Section(s)
4. Detailed Plan Sheets
5. Cross Sections
6. Special Details may include - Temporary Drainage; Temporary Signalization; Intersection Details; etc.
19.4 Format

TTC plans will be prepared on standard plan sheet format. A scaled drawing is not always required; however, clarity and legibility are critical. When scaled drawings are required, the scale shall not be less than 1" = 100' for plan sheets and 1" = 40' for special details. Levels, fonts and line weights shall be in accordance with the *FDOT CADD Production Criteria Handbook*.

Tools are available in FDOT Engineering/CADD Systems Software to assist in the development of Temporary Traffic Control Plans.
# Chapter 22

## Miscellaneous Structures Plans

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
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<tbody>
<tr>
<td>22.1</td>
<td>General</td>
<td>22-1</td>
</tr>
<tr>
<td>22.2</td>
<td>Approach Slabs</td>
<td>22-2</td>
</tr>
<tr>
<td>22.3</td>
<td>Retaining Walls (Cast in Place, Proprietary, Temporary)</td>
<td>22-3</td>
</tr>
<tr>
<td>22.4</td>
<td>Concrete Box Culverts</td>
<td>22-4</td>
</tr>
<tr>
<td>22.5</td>
<td>Three-Sided Concrete Culverts</td>
<td>22-6</td>
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### Exhibits

<table>
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<th>Exhibit</th>
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<th>Page</th>
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<tbody>
<tr>
<td>Exhibit 22-1</td>
<td>Three-sided Concrete Culvert Notes</td>
<td>22-7</td>
</tr>
</tbody>
</table>
Chapter 22

Miscellaneous Structures Plans

22.1 General

Miscellaneous structures not included in the bridge plans shall be included in the appropriate component plans. This includes box or three-sided culvert details, high mast lighting supports, traffic mast arm supports, signal strain poles, overhead sign supports, rest area structures or buildings, barrier walls (traffic or sound), retaining walls and toll facilities.

For guidelines on structural detailing, refer to the Structures Detailing Manual (Topic No. 625-020-200).
22.2 Approach Slabs

As of the July, 1999 letting, approach slab details sheets are included in the structures plans. However, some roadway elements may need to be carried onto the approach slab, and in these cases special attention must be given to clarifying in the plans which elements are to be included as part of the roadway.

The stabilization required under the approach slabs shall be paid for using the standard roadway pay item and the quantity included in the roadway plans. In addition, roadway elements such as guardrail, earthwork, sidewalks, approach slab surfacing, etc., which are part of the roadway approaches to the bridge and which interface with the approach slabs areas, will also be included and paid for in the roadway quantities.
22.3 Retaining Walls (Cast in Place, Proprietary, Temporary)

When cast in place retaining walls other than standard gravity walls are required, complete design and construction details, including pay items and quantities are required in the contract plans. The same is true for steel or concrete sheet piles for either permanent or temporary retaining walls.

Proprietary walls are handled differently than cast in place, steel and concrete sheet pile retaining walls. A set of control plan details must be developed for retaining walls. (See Chapter 30, Volume I for a discussion concerning the requirements for control plan details).

On projects with bridges the control plan details shall be included in the bridge plans. When there are no bridge plans the control plan details shall be included in the appropriate component plans. Examples of control plan details are included as exhibits at the back of this chapter.

Standard drawings from the preapproved wall companies are included in the Design Standards (available as Interim Index Drawings).
22.4  Concrete Box Culverts

Complete design and construction details, including pay items and quantities are required in the contract plans for concrete box culverts. Include the following minimum design details:

1. Plan view (usually shown on the Plan-Profile sheet – see Chapter 10, Exhibit PP-2) showing: Grid north arrow; scale bar; existing highway boundaries including existing ROW monuments; culvert or bridge identification number; culvert and highway alignment; survey baseline; profile grade line; direction of stationing; stream channel alignment; stream flow direction; skew angle of the culvert relative to the centerline of roadway; stationing along the profile grade line including begin and end station of culvert (outside face of sidewalls); length of culvert; subsurface exploration locations (e.g., boring locations); culvert end treatment (headwall and wing wall orientation); scour protection; slope protection; limit of stream work; utilities; traffic railing and pedestrian/bicycle railing type.

2. Elevation view (usually shown on the Plan-Profile sheet – see Chapter 10, Exhibit PP-2) showing: Elevation vertical scale; profile grade line and vertical data; existing stream bottom and ground line (along PGL); utilities.

3. A longitudinal section along the culvert centerline (usually shown on the Drainage Structures sheet – see Chapter 14, Exhibit DS-2) showing: Culvert or bridge identification number; invert elevations; existing stream bottom or original ground; culvert stationing at centerline; typical highway section (including rail treatment); design earth cover height (measured from the top of the top slab to the top of pavement); limits of scour protection (including any keyways or geotextile fabric lining); channel work; culvert end treatments; utility (either attached to the fascia, or in the embankment, traffic railing or sidewalk); wing walls; headwalls; cutoff walls; reference to the appropriate Design Standard Indexes.

4. Data Sheets (see Chapter 7.3):
   a) For LRFD Designs: Box Culvert Data Table and Reinforcing Bar List.
   b) For LFD Designs: Box Culvert Data Sheet.

5. Miscellaneous details showing (usually shown on Box Culvert Detail sheets, located after the Drainage Structure sheets): Construction phasing information (affects lengths of precast segments and potential need for skewed segments) including appropriate excavation support and protection systems (e.g., critical temporary walls); traffic railing details including connection details; slope and/or stream bank protection; channel section detail; culvert-end safety grate, guardrail or fencing details when applicable; removal of existing culvert(s); cofferdams or water diversion.
6. Notes (usually on the Box Culvert Data Sheets) indicating: Live loading requirements (HL-93 or HS-25); hydraulic data (show 100-year design flow or the design flow used and the minimum hydraulic area perpendicular to flow below the Design High Water); environmental classification for durability; minimum concrete class and reinforcing steel grade; assumed soil weight, angle of internal friction and nominal bearing capacity; differential soil settlement height and effective length (when significant); precast culvert limitations; any special joint waterproofing requirements; erosion and sediment control and stormwater pollution prevention plan requirements; restrictions for work in streams; estimated quantities.
22.5 Three-Sided Concrete Culverts

Complete footing, wingwall and channel lining designs and construction details are required for three-sided culverts. However only conceptual culvert barrel and headwall design details need to be provided. Include the following minimum design details in the roadway plans and place directly after the Drainage Structure sheets:

1. Plan view showing the orientation of the ends of the structure. The two most typical options for culverts on a skew are ends parallel to the centerline of the roadway (skewed ends) or ends perpendicular to the centerline of the structure (square ends). The end treatment depends upon the skew, whether it is in a fill section or at grade, the location within the right of way, conflicts with utilities, phased construction details, the alignment of the feature crossed, and other site limitations.

2. Elevation view showing the configuration of the most appropriate type unit (e.g., frame or arch). Any limitations on using a larger span must be shown. (Some manufacturers only fabricate units at fixed increments of span length, therefore showing the limitations will allow the manufacturers to bid using special units or the next larger span length of their standard units). Show other acceptable structure types in separate partial elevation views. Limiting spans and heights must be shown for all alternatives.

3. No precast manufacturer should be eliminated from consideration for a given project. However, specific project requirements that may exclude some manufacturers must be identified (such as fabrication on a skew or a desired arched appearance).

4. Complete details for a cast-in-place footing design, including design loads and assumptions for the spread footings.

5. Complete details for cast-in-place wingwalls, including geometry and reinforcement details.

6. Estimated quantities for concrete and reinforcing steel for cast-in-place elements, but do not include separate pay items.

7. Payment limits shall be identified as the length of the total structure along a longitudinal centerline of the structure.

8. The applicable details in Section 22.4 shall also be included.

9. See Exhibit 22-1 for a list of applicable notes that may be required.
Exhibit 22-1  Three-sided Concrete Culvert Notes

The following notes shall be included adjacent to the plan or elevation views, as applicable:

1. The assumed foundation vertical reaction is ____ kips/ft. The assumed foundation horizontal reaction is ____ kips/ft. The Contractor must submit a revised foundation design to the Engineer if the actual loads of the supplied structure exceed these assumed values. Any revised foundation design must be included in the shop drawings and submitted for approval at the same time as the design calculations for the three-sided structure.

2. (In cases where squaring of the unit ends would create a geometric conflict with right of way, utilities, phase construction or site geometry, include the following note):
   
   Due to site restrictions, only skewed end units are acceptable.

3. (If site constraints do not eliminate the squaring of the ends, include the following note):
   
   Squared end units may be substituted for skewed end units with no change in the payment limits and no additional cost to the Department.

4. (When traffic railings are attached to skewed headwalls and site constraints do not eliminate the squaring of the ends, include the following note):
   
   If the Contractor proposes to substitute square ends, details of the traffic railing attachment must be provided in the shop drawings and approved by the Engineer.
## GEOTECHNICAL INFORMATION

<table>
<thead>
<tr>
<th>Depth Below Existing Ground Line (ft.)</th>
<th>Wall No. 1 &amp; 2</th>
<th>Wall No. 3</th>
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<tbody>
<tr>
<td></td>
<td>0'–6'</td>
<td>0'–10'</td>
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<tr>
<td></td>
<td>6'–12'</td>
<td>10'–24'</td>
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<tr>
<td></td>
<td>12'–30'</td>
<td>24'–36'</td>
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<td>Effective Unit Weight (pcf)</td>
<td>110 (moist weight in place)</td>
<td>118</td>
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<td>Cohesion (psf)</td>
<td>0</td>
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<tr>
<td>Internal Friction Angle</td>
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### RETAINING WALL VARIABLES

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<tr>
<th>Wall No.</th>
<th>Long Term Settlement (in.)</th>
<th>Short Term Settlement (in.)</th>
<th>Differential Settlement (in./ft.)</th>
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<td>1 &amp; 2</td>
<td>2&quot; to 3&quot;</td>
<td>1&quot; to 2&quot;</td>
<td>1/4&quot;/1'</td>
</tr>
<tr>
<td>3</td>
<td>2&quot; to 3&quot;</td>
<td>1&quot; to 2&quot;</td>
<td>1/4&quot;/1'</td>
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### SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY

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<tr>
<th>Wall No.</th>
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<th>Reinforcement Length (ft.)</th>
<th>Factored Bearing Resistance (psf)</th>
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<td>22–25</td>
<td>16</td>
<td>2467</td>
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</tbody>
</table>

### NOTES:

1. Concrete facing panel surfaces treatment will be a fluted, trapezoid, V-groove, fractured rib 3/8" on 1 1/2" centers similar to Burke Form Liner, Pattern No. 80112 (Waterfall).

2. If required, the soil reinforcement and fasteners for the abutment wall will be designed and furnished by proprietary wall company. The soil reinforcement will be designed to resist a factored horizontal load of 3.5 kips/ft of back wall width. The cost of soil reinforcement and fasteners will be included in the cost of the retaining wall system.

3. Applicable FDOT Wall Types for each wall location are listed below. See the Qualified Products List for approved wall systems and the Table of FDOT Wall Types on Index No. 5300 of the Design Standards for allowable wall type substitutions.

4. See Design Standards Index No. 5300 for General Notes And Details.

5. Longitudinal dimensions shown in the plans are measured along the exterior face of the wall. Elevations shown are to the top of coping, top of leveling pad or top of wall footing.
NOTES:

1. For Top of Coping Elevations see sheet SW=9.

2. Top of kerfing and depth above should be in feet and inches.

3. Provide 1/4" expansion joints in traffic.

4. The plan shows 3/4" expansion joints in traffic.

5. Provide 1/4" expansion joints in traffic.

6. For additional information regarding drainage structures and utility locations, see roadway plans.

EXHIBIT CP-2
Date: 1/1/06

WSE WALL NO. 1
## TEMPORARY RETAINING WALL SYSTEM DATA TABLES

### GEOTECHNICAL INFORMATION

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<tr>
<th>Depth Below Existing Ground Line (ft.)</th>
<th>Reinforced Soil &amp; Random Block Fill</th>
<th>Loose Fine Sand</th>
<th>Firm Fine Sand</th>
<th>Loose Clayey Fine Sand</th>
<th>Firm Clayey Fine Sand</th>
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<tbody>
<tr>
<td>Wall No. 1</td>
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<td>0'-0&quot;</td>
<td>9'-23&quot;</td>
<td>23'-37&quot;</td>
<td>37'-45&quot;</td>
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<tr>
<td>Wall No. 2</td>
<td>---</td>
<td>0'-0&quot;</td>
<td>9'-23&quot;</td>
<td>23'-37&quot;</td>
<td>37'-45&quot;</td>
</tr>
</tbody>
</table>

Effective Unit Weight (pcf) | 110 | 118 | 118 | 120 | 110 |

Cohesion (psf) | 0 | 0 | 0 | 0 | 0 |

Internal Friction Angle | 30° | 34° | 34° | 35° | 30° |

Depth Below Existing Ground Line (ft.) | Wall No. 3 | 0'-10" | 10'-15" | 15'-17" | 17'-45" |
| Wall No. 4                            | 0'-10" | 10'-15" | 15'-17" | 17'-45" |

Effective Unit Weight (pcf) | 110 | 118 | 118 | 120 | 118 |

Cohesion (psf) | 0 | 0 | 0 | 4177 | 0 |

Internal Friction Angle | 30° | 32° | 34° | 0 | 34° |

### RETAINING WALL VARIABLES

<table>
<thead>
<tr>
<th>Wall No.</th>
<th>Wall Settlement</th>
<th>Long Term Settlement (in.)</th>
<th>Short Term Settlement (in.)</th>
<th>Differential Settlement (in./ft.)</th>
<th>Air Contaminants Classification</th>
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</thead>
<tbody>
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<td>1 &amp; 2</td>
<td>1½'</td>
<td>3⁄₈&quot;</td>
<td>⅝½&quot;/1'</td>
<td>Extremely Aggressive</td>
<td></td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>3½'</td>
<td>1⁄₄&quot;</td>
<td>⅝½&quot;/1'</td>
<td>Extremely Aggressive</td>
<td></td>
</tr>
</tbody>
</table>

### SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY

<table>
<thead>
<tr>
<th>Wall Height (ft.)</th>
<th>Reinforcement Length (ft.)</th>
<th>Factored Bearing Resistance (psf)</th>
</tr>
</thead>
<tbody>
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<td>5'-0&quot;</td>
<td>7'-0&quot;</td>
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<tr>
<td>6'-6&quot;</td>
<td>7'-6&quot;</td>
<td>1648</td>
</tr>
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</table>

### NOTES:

1. See the Qualified Products List for approved Wall Systems (Type 3).
2. See Design Standards Index No. 5301 for General Notes and Details.

**Note:** Use CADD Cells "05301". Work this cell with Design Standards, Index No. 5301.
PLAN VIEW TEMP. MSE WALL NOS. 3 & 4

EXPANDED ELEVATION VIEWS (TEMP. MSE WALL NOS. 3 & 4, LOOKING AT FRONT WALL)

STATION 665+75.60 (LT.)
EL. 117.569 (END APP. SLAB)

STATION 674+21.26, 17'-8" (RT.)
EL. 118.770

STATION 674+21.26 (RT.)
EL. 118.015

EXHIBIT CP-8

Date: 1/1/06

ENGINEERS OF RECORD:

Approved by

SHEET NO.

$DATE$

$TIME$

$FILE$

$USER$

COUNTY

ENGINEER OF RECORD:

SHEET TITLE:

PROJECT NAME:

NAME

DESIGNED BY

CHECKED BY

REVISIONS

DEPARTMENT OF TRANSPORTATION

FLORIDA DEPARTMENT OF TRANSPORTATION

R/W

R/W

R/W

R/W

R/W

R/W

R/W

R/W

R/W
Chapter 23

Signing and Pavement Marking Plans

23.1 General

Signing and pavement marking plans are usually a component set of plans. Projects with minor signing and pavement markings may include these features on sheets in the roadway plan set or detailed on roadway sheets. When prepared as component plans they shall be assembled as a separate plans set complete with a key sheet, tabulation of quantities and all other signing and pavement marking sheets. When prepared as component plans, the sheets shall be numbered consecutively with the sheet numbers prefixed by the letter “S”.

A complete set of signing and pavement marking plans shall include the following sheets:

1. Key Sheet
2. Tabulation of Quantities
3. Plan Sheets
4. Guide Sign worksheet (if required)
5. Overhead Sign Cross Section Sheet (if required)
6. Overhead Sign Support Design (if required)
7. Foundation Details (if required)
8. Boring Data Sheets (if required)

In addition, the signing and pavement marking plans may contain sheets which were prepared separately (perhaps by a sub-consultant) and incorporated into the roadway plans early in the design process. These sheets will appear at the end of the numbered sequence of the roadway plans and must be identified with the following prefixes:

GS-# Soil Survey and Report of Core Borings normally associated with the signing and pavement marking plans set (including miscellaneous structures but excluding bridges and walls)

Pavement marking material on projects that include new asphalt surfaces will generally be paint, rather than thermoplastic. This is based on the requirement of a 90-day curing period for new asphalt. Thermoplastic markings on these projects must be placed using a
separate contract. Exceptions must be coordinated with the District Construction Office.

Section 23.9 provides guidance for preparation of separate plans for Thermoplastic Markings.

Thermoplastic may be called for in the plans on those projects that are exclusively of concrete pavement surfaces.

23.2 Key Sheet

The key sheet is the first sheet in the set and shall be prepared on a standard key sheet format as described in Chapter 3 of this volume. Contract plans set information, location map and length of project box are not required on this sheet when shown on the lead key sheet. A complete index of signing and pavement marking plans shall be shown on the left side of the sheet.

Other data, including name, consultant contract number, vendor number, and certificate of authorization number of the firm (when plans are prepared by a consultant) shall be shown as described in Chapter 3 of this volume.

If shop drawings are anticipated, the name(s) and address(es) of the Delegated Engineer(s) for shop drawing review(s) shall be shown on the right side of the sheet.
Chapter 24

Signalization Plans

24.1 General

Signalization Plans are usually a component set of plans. Projects with minor signalization may include these features on sheets in the roadway plans set or on the roadway sheets (or in another component plans set or on that component’s sheets when appropriate). When prepared as component plans they shall be assembled as a separate plans set complete with a key sheet, tabulation of quantities and all other relevant signal sheets. When prepared as component plans, the sheets shall be numbered consecutively with the sheet numbers prefixed by the letter “T”.

The signalization plans show the construction details, electrical circuits, signal phasing and other relevant data.

A complete set of signalization plans shall include the following sheets:

1. Key Sheet
2. Tabulation of Quantities
3. Plan Sheets
4. Mast Arm Details (if required)
5. Foundation Details - Mast Arms (if required)
6. Boring Data Sheets - Mast Arms (if required)

In addition, the signalization plans may contain sheets which were prepared separately (perhaps by a sub-consultant) and incorporated into the roadway plans early in the design process. These sheets will appear at the end of the numbered sequence of the roadway plans and must be identified with the following prefixes:

GT-# Soil Survey and Report of Core Borings normally associated with the signalization plans set
PTM-# Portable Traffic Monitoring Site Sheets
24.2 Key Sheet

The key sheet is the first sheet in the component plans set and shall be prepared as described in Chapter 3 of this volume. The location map, length of project box and contract plans set information are not required on this sheet when shown on the lead key sheet. The index of signalization plans shall be shown on the left of the sheet. Other data, including name, consultant contract number, vendor number, and certificate of authorization number of the firm (when plans are prepared by a consultant), shall be shown as described in Chapter 3 of this volume.

If shop drawings are anticipated, the name(s) and address(es) of the Delegated Engineer(s) for shop drawing review(s) shall be shown on the right side of the sheet.
Chapter 25

Lighting Plans

25.1 General

Lighting Plans are usually a component set of plans. Projects with minor lighting may include these features on sheets in the roadway plan set or detailed on the roadway plans. When prepared as component plans they shall be assembled as a separate plans set complete with a key sheet, tabulation of quantities and all other relevant lighting sheets. When prepared as component plans, the sheets shall be numbered consecutively with the sheet numbers prefixed by the letter “L”.

The lighting plans shall show the construction details, electrical circuits, pole data, conduits, service points, luminaires, foundations, boring details and other relevant data.

A complete set of lighting plans shall include the following sheets:

1. Key Sheet
2. Tabulation of Quantities
3. Pole Data and Legend Sheet
4. Plan Sheets or Layout Sheets
5. Foundation Details - High Mast (if required)
6. Boring Data Sheets - High Mast (if required)

In addition, the lighting plans may contain sheets which were prepared separately (perhaps by a sub-consultant) and incorporated into the roadway plans early in the design process. These sheets will appear at the end of the numbered sequence of the roadway plans and must be identified with the following prefixes:

GL-# Soil Survey and Report of Core Borings normally associated with the lighting plans set
25.2 Key Sheet

The key sheet is the first sheet in the component plans set and shall be prepared as described in Chapter 3. The location map, length of project box and contract plans set information are not required on this sheet when shown on the lead key sheet. Index of lighting plans shall be shown on the left of the sheet. Other data, including name, consultant contract number, vendor number, and certificate of authorization number of the firm (when plans are prepared by a consultant), shall be shown as described in Chapter 3.

If shop drawings are anticipated, the name(s) and address(es) of the Delegated Engineer(s) for shop drawing review(s) shall be shown on the right side of the sheet.
Chapter 26
Landscape Plans

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Chapter 26

Landscape Plans

26.1 General

“Landscape” or “landscaping” means any vegetation, mulches, irrigation systems, and any site amenities, such as street furniture, decorative paving, fences, and lighting (excluding public utility street and area lighting). The Legislature has requested that the Department commit program dollars to landscaping. In order for the Department to capture that information, it is critical that all landscape pay items shall be placed in TRNS*PORT Category 0600 whether the landscape plans are a component set of plans, or prepared independently. Projects with minor landscaping may include these features on separate sheets in the roadway plans set or features may be detailed on roadway plans sheets. When prepared as component plans they shall be assembled as a separate plans set complete with a key sheet, tabulation of quantities, schedule, and all other relevant landscape sheets. When prepared as component plans, the sheets shall be numbered consecutively with the sheet numbers prefixed by the letters “LD”.

A complete set of landscape plans shall include the following:

1. Key Sheet
2. Tabulation of Quantities and Plant Schedule
3. Tabulation of Quantities and Schedule for Irrigation and Site Amenities
4. Plan Sheets
5. Details Sheet
6. Other relevant plan sheets as outlined in this chapter
26.2 Key Sheet

The key sheet is the first sheet in the component plans set and shall be prepared as described in Chapter 3. The location map, length of project box and contract plans set information are not required if shown on the lead key sheet. The index of landscape plans shall be shown on the left of the sheet. Other data, including name, consultant contract number, vendor number, and certificate of authorization number of the firm (when plans are prepared by a consultant) shall be shown as described in Chapter 3.
26.3 Tabulation of Quantities and Schedule

26.3.1 Tabulation of Quantities and Plant Schedule

The tabulation of quantities and plant schedule sheet or a similar sheet should be utilized to tabulate the materials required for the construction of the landscaping and provide the description, size and quantity of materials in a tabular format. The tabulation of quantities and plant schedule sheet is required to conform with the format of Exhibit LD-1 and shall be prepared separately from the tabulation of quantities for irrigation and site amenities.

26.3.2 Tabulation of Quantities and Schedule for Irrigation and Site Amenities

The tabulation of quantities and schedule for irrigation and site amenities shall utilize the standard tabulation of quantities sheet and provide the additional information given in the example in Table 26.1.

Table 26.1 Example Tabulation of Quantities and Schedule for Irrigation and Site Amenities

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Quantity</th>
<th>Unit</th>
<th>Description / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP</td>
<td>5000</td>
<td>LF</td>
<td>½” PVC Sch 40 (or C-160) zone / lateral pipe &amp; appropriate fittings</td>
</tr>
<tr>
<td>PR</td>
<td>100</td>
<td>EA</td>
<td>6” pop-up rotor, nozzle, riser &amp; appropriate fittings</td>
</tr>
<tr>
<td>CM</td>
<td>1</td>
<td>EA</td>
<td>Control module, latching solenoid, run shut-off device &amp; appropriate fittings</td>
</tr>
<tr>
<td>ABB</td>
<td>5</td>
<td>EA</td>
<td>Arcata, backless bench, PolySite recycled plastic, Powdercoat ‘Frost’</td>
</tr>
<tr>
<td>WCB</td>
<td>10</td>
<td>EA</td>
<td>Wausau Conical Bollard TF6071, B1 finish</td>
</tr>
</tbody>
</table>

On contracts with multiple Financial Project ID's or Federal Aid and non-Federal Aid quantities, provisions shall be made to tabulate and summarize their respective quantities.
26.4 General Notes

General notes pertaining to landscape plans may be shown on a separate plan format sheet. This sheet shall be placed behind the tabulation of quantities in the plans assembly.

26.5 Plan Sheets

Plan sheets shall be prepared in a manner that is consistent with a set of construction documents rather than an illustrative plan. Therefore plan sheets shall utilize simplified symbols depicting the location of materials in a legible manner. Plan sets shall employ a level of detail and clarity that allow the reviewer to assess the relationship between the proposed landscape design, the roadway plans, utilities, outdoor advertising signs, and adjoining land use.

26.5.1 Format and Scale

Plan sheets shall be prepared on a standard plan sheet format. The scale shall be such that all details are clear and legible. However, the scale shall not be smaller than 1" = 100'. For simple projects, or narrow sections of a project, it may be possible to "stack" two plans on one sheet, one below the other. Stationing shall progress from left to right and shall be stacked from top to bottom. Irrigation plan sheets may be prepared at a larger scale than the planting plan sheets. Clarity and legibility shall be preserved in all cases.

A north arrow and scale shall be shown, as applicable, at a point of maximum visibility on the sheet. If two plans are "stacked" on one sheet, each plan portion shall contain a north arrow and scale.

26.5.2 Requirements for Plan Sheets

The base information required is as follows:

1. Project centerline
2. Edge of pavement (edge of traffic lanes)
3. Curbs or curb and gutter
4. Drainage systems
5. Guardrails
6. Right of way and/or limited access fence line
7. Sidewalks or other planned or existing structures
8. Lighting, signs and signal poles
9. Intersections and driveways which are noted in the plans
10. Existing and proposed overhead and underground utility locations
11. Clear Zone/Horizontal clearance (should be plotted or safety setback distances noted frequently on each plan sheet)
12. View zones for permitted outdoor advertising signs
13. Canopy limits
14. Existing vegetation (to remain or be removed)
15. Existing off site features and conditions that affect or are affected by the project
16. Fence and gate locations
17. Setbacks from structural elements or drainage system
18. Limits of clear sight (Index No. 546 of the Design Standards)
19. Transit Facilities

Planting plan sheets shall also provide at a minimum the plant symbols and the plant quantities. Additional information such as the common name and botanical name of each plant may be provided.

Site amenities, such as street furniture, decorative paving, fences, and lighting (excluding public utility street and area lighting) shall be included on the planting plan sheets with appropriate annotation.

Irrigation plan sheets shall be prepared using the planting plan sheets (devoid of unnecessary text and labeling) and shall contain information pertaining to the irrigation system. Information on the sheet shall include the approximate location of spray heads and rotors, valves, mainlines, lateral lines, sleeves, controllers, water sources / point of connection, backflow preventers, and isolation valves.
26.6 Details Sheet

This sheet shall show all landscape details, hardscape details and irrigation details, which are applicable to the project and not addressed in the Design Standards.

The details sheet shall include a legend clearly depicting the symbology used in the irrigation plan sheets and an associative description for each entry. Additional information such as the nozzle schedule and irrigation zone / lateral schedule can be included on these sheets.
The following narrative of the Stormwater Pollution Prevention Plan contains references to the Standard Specifications for Road and Bridge Construction, the Design Standards, and other sheets of these construction plans. The first sheet of the construction plans is the Key Sheet which contains an index to the other sheets. The complete Stormwater Pollution Prevention Plan includes several sheets, this narrative description of the documents. In this narrative description of the documents referenced in this narrative, the contractor's approved erosion and sedimentation control plan is described. Specification Section 104, and reports of inspections made during construction.

1. Nature of Construction Activity

The project is the reconstruction of SR 007 (James Bond Boulevard) to a major urban roadway. This involves constructing roadway surface, curbs, and gutters, sidewalks, underground storm sewer systems, and stormwater management facilities. The project stretches from north of Paul Russell Road to Perkins Road, a distance of approximately 1.2 miles.

1.a. Sequence of Major Soil Stabilizing Activities

In the Section 04 A1 Erosion Control Plan, the contractor shall provide a detailed sequence of construction for all construction activities. The contractor shall submit the sequence of major erosion control activities described below, unless the contractor proposes a different sequence that is equal or better.

1.b. Runoff Data

Runoff Coefficients Before: 0.82.

1.c. Area Estimates

Total area to be disturbed: 19.6 acres.

Total site area: 19.6 acres.

1.d. Runoff Data

Runoff Coefficients Before: 0.82.

DURING DRY PERIOD:

Runoff Coefficients Before: 0.82.

1.e. Site Map

The construction plans are being used as the site maps. The location of the required information is described below. The sheet numbers for the plan sheets referenced are identified on the Key Sheet of these construction plans.

1.f. Receiving Waters:

There are no wetland areas on the project site.

**Approximate Slopes:**

The slopes of the site can be seen in the Cross Section Sheets and the Plan-Profile Sheets. These are pond cross sections located with the Pond Detail Sheets.

**Areas of Soil Disturbance:**

The areas to be disturbed are indicated on the Plan-Profile Sheets, the Cross Section Sheets, and the Pond Detail Sheets. Any areas where permanent features are shown to be constructed above or below ground will be disturbed.

**Areas Not To Be Disturbed:**

Essentially the whole project will be disturbed during construction.

**Locations of Temporary Controls:**

These are shown on the Erosion Control Plans. The controls associated with the box culvert replacement which is shown on the Box Culvert Construction Detail Sheet. Table providing summaries of temporary erosion and sediment control items are provided in the Summary of Quantity Sheets.

**Locations of Permanent Controls:**

The stormwater ponds are the primary permanent stormwater management controls. These are shown on the Pond Detail Sheets.

**Areas To Be Stabilized:**

Temporary stabilization practices are shown in the same location as the temporary controls mentioned above. Permanent stabilization is shown on the Typical Section Sheets, the Plan-Profile Sheets, and the Pond Detail Sheets.

**Surface Water:**

The only surface water within the site is the East Ditch, which flows through the culvert at Section 53+00. This is located on the Plan-Profile Sheets and the Box Culvert Construction Detail Sheet.

**Drainage Points:**

These are shown on the Plan-Profile Sheets or the East Ditch culvert at Section 53+00.

**Receiving Water:**

These are shown on the Pond Detail Sheets.

See here for the outlet locations and receiving water names. There are no wetland areas on the project site.
2.b.1  Stabilization Practices:

In the Section 104 Erosion Control Plan, the contractor shall describe the stabilization practices proposed to control erosion. The contractor shall include all stabilization measures as soon as practical, but in no case more than 7 days, in portions of the site where construction activities have temporarily or permanently ceased. The stabilization practices shall include at least the following, unless otherwise approved by the Engineer:

- Sediment Basin. The permanent stormwater ponds will be temporarily modified according to the details in the TCP.
- Inlet protection in accordance with Design Standard 102 and special details shown in the TCP.
- Sandbags to control erosion and trap silt.
- Synthetic Bales in accordance with Design Standard 102.

2.b.2  Structural Practices:

In the Section 104 Erosion Control Plan, the contractor shall describe the proposed structural practices to control or trap sediment and otherwise prevent the discharge of pollutants from exposed areas of the site. Sediment controls shall be in place before disturbing soil upstream of the control. The structural practices shall include at least the following, unless otherwise approved by the Engineer:

- Silt fence in accordance with Design Standard 102 and Specification Section 104.
- Synthetic Bales in accordance with Design Standard 102 and Specification Section 104.
- Sandbags to control erosion and trap silt.
- Sod.

2.d.  Stormwater Management:

Sewage, storm sewer, and other facilities have been permitted by the Florida Department of Environmental Protection (FDEP) and the City of Narcoossee, and comply with applicable design standards.
2.c. Other Controls

2.c.1 Waste Disposal:
in the Section 104 Erosion Control Plan, the contractor shall describe the proposed procedures for applying fertilizers and pesticides. The proposed procedures shall comply with applicable subsections of either Section 370 or 371 of the Specifications.

2.c.2 Off-Site Vehicle Tracking & Dust Control:
in the Section 104 Erosion Control Plan, the contractor shall describe the proposed methods for minimizing offsite vehicle tracking of sediments and generating dust. The proposed methods shall include at least the following, unless otherwise approved by the Engineer:

- Providing litter control and collection within the project during construction activities.
- Disposing of all fertilizer or other chemical containers according to EPA’s standard practices as detailed by the manufacturer.
- Disposing of solid materials including building and construction materials off the project site but not in surface waters, or wetlands.

2.c.3 Other Controls:
in the Section 104 Erosion Control Plan, the contractor shall describe the procedures for applying fertilizers and pesticides. The proposed procedures shall comply with applicable subsections of either Section 370 or 371 of the Specifications.

2.c.4 Fertilizers and Pesticides:
in the Section 104 Erosion Control Plan, the contractor shall describe the procedures for applying fertilizers and pesticides. The proposed procedures shall comply with applicable subsections of either Section 370 or 371 of the Specifications.

2.c.5 Toxic Substances:
in the Section 104 Erosion Control Plan, the contractor shall provide a list of toxic substances that are likely to be used on the job and provide a plan addressing the generation, application, migration, storage, and disposal of these substances.

2.c.6 Approved State and Local Plans and Permits:
- FDEP Rule Chapter 62-25 FaA.
- City of Narcoossee Environmental Management Ordinance Number 90-0-0044aa.
- FDEP Rule Chapter 62-25 F.A.C.

2.d. Maintenance:
Maintenance in the Section 104 Erosion Control Plan, the contractor shall provide a plan for maintaining erosion control on site. The maintenance plan shall include at least the following, unless otherwise approved by the Engineer:

- Stormwater management systems.
- Areas used for storage of materials that are exposed to precipitation.
- Structural controls.

2.e. Stormwater Management:
- Stormwater management systems.
- Locations where vehicles enter or exit the site.

4.0 Inspections:
Qualified personnel shall inspect the following items at least once every seven calendar days and within 0.50 inches of the end of the road that is 0.50 inches of the end of the road. To comply, the contractor shall install and maintain rain gages and record the daily rainfall. Where sites have been permanently stabilized, inspections shall be conducted at least once each month. The contractor shall also inspect that controls installed in the field agree with the latest Stormwater Pollution Prevention Plan.

- Points of discharge to municipal separate storm sewer systems.
- Points of discharge to non-storm sewer systems.
- Disturbed areas of the site that have not been fully stabilized.
- Areas used for storage of materials that are exposed to precipitation.

3.0 Non-Stormwater Discharges:
- Non-stormwater discharges (except flows from fire fighting activities). The contractor shall identify all anticipated non-stormwater discharges (except flows from fire fighting activities).
- The contractor shall also inspect that controls installed in the field agree with the latest Stormwater Pollution Prevention Plan.

- Points of discharge to waters of the United States.
- Points of discharge to non-storm sewer systems.
- Disturbed areas of the site that have not been fully stabilized.
- Areas used for storage of materials that are exposed to precipitation.
- Structural controls.
- Stormwater management systems.
- Locations where vehicles enter or exit the site.

The contractor shall initiate repairs within 0.50 inches of the end of the road or 0.50 inches of the end of the road. Inspections indicate that the installed stabilization and structural practices are not sufficient to minimize erosion, retain sediment, and prevent discharging pollutants, the contractor shall provide additional measures, as approved by the Engineer.

5.0 Non-Stormwater Discharges:
in the Section 104 Erosion Control Plan, the contractor shall identify all anticipated non-stormwater discharges (except flows from fire fighting activities). The contractor shall also inspect that controls installed in the field agree with the latest Stormwater Pollution Prevention Plan.

- Points of discharge to waters of the United States.
- Points of discharge to non-storm sewer systems.
- Disturbed areas of the site that have not been fully stabilized.
- Areas used for storage of materials that are exposed to precipitation.
- Structural controls.
- Stormwater management systems.
- Locations where vehicles enter or exit the site.

The contractor shall initiate repairs within 0.50 inches of the end of the road or 0.50 inches of the end of the road. Inspections indicate that the installed stabilization and structural practices are not sufficient to minimize erosion, retain sediment, and prevent discharging pollutants, the contractor shall provide additional measures, as approved by the Engineer.

- Points of discharge to municipal separate storm sewer systems.
- Points of discharge to non-storm sewer systems.
- Disturbed areas of the site that have not been fully stabilized.
- Areas used for storage of materials that are exposed to precipitation.
- Structural controls.
- Stormwater management systems.
- Locations where vehicles enter or exit the site.

The contractor shall initiate repairs within 0.50 inches of the end of the road or 0.50 inches of the end of the road. Inspections indicate that the installed stabilization and structural practices are not sufficient to minimize erosion, retain sediment, and prevent discharging pollutants, the contractor shall provide additional measures, as approved by the Engineer.
# Chapter 29

## Intelligent Transportation Systems Plans

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Chapter 29

Intelligent Transportation Systems Plans

29.1 General

The incorporation of Intelligent Transportation Systems (ITS) Plans is a relatively new development, yet it is becoming more widespread. This chapter was developed to introduce some standardization for ITS Plans. ITS Plans are usually a component set of plans. Projects with minor ITS involvement may include these features on sheets in the roadway plans set or on the roadway sheets (or on sheets in the signalization plans set or on the signalization sheets if applicable). When prepared as component plans they shall be assembled as a separate plans set complete with a key sheet, tabulation of quantities and all other relevant ITS sheets. When prepared as component plans, the sheets shall be numbered consecutively with the sheet numbers prefixed by the letters “IT”.

A complete set of ITS Plans shall include the following sheets:

1. Key Sheet
2. Tabulation of Quantities
3. Plan Sheets or “letter type” plan sets
4. Detail Sheets (as required)

The ITS Plans show the construction details, electrical circuits, and other data relevant to an ITS project. Some of the different systems that may be produced under the ITS component set of plans include, but are not limited to, the following:

1. Freeway Management System
2. Incident Management System
3. Arterial Management System
4. Emergency Management Systems
5. Transit Management Systems
6. Electronic Toll Collection
7. Electronic Fare Payment
8. Highway Rail Intersections (under electronic surveillance)
9. Regional Multimodal Traveler Information

The Districts have been gravitating toward utilizing a modified plans format for ITS projects. The modified plans format would allow for “letter type” plans and include a table to locate the devices by mile post to three decimal places, plus an offset dimension given for each
above-ground structure. Global positioning system (GPS) coordinates can be utilized as supplemental information in the table.

For construction purposes the plans should include the following:

1. Table (spreadsheet) to locate devices by mile post to three decimal places.
2. For above-ground installations, give an offset dimension from the edge of the travelway to the ITS device.
3. For such devices as DMS that require overhead structures, include a cross section using “assumed” elevation.
4. For conduit, include number and sizes.
5. For fiber optic cable, include number of fibers.

Regarding as-built records, aerial photographs may be furnished with the table above to provide supplementary information. The aerials will not include the extra features of the ROW, baseline, or roadway edges being drawn in. The aerials are to be used as a base for the as-built plans with the mile post and offset dimensions provided by the Contractor.
29.2 Key Sheet

The key sheet is the first sheet in the component plans set and shall be prepared as described in Chapter 3 of this volume. The location map, length of project box and contract plans set information are not required on this sheet when shown on the lead key sheet. The index of ITS plans shall be shown on the left of the sheet.

Other data, including name, consultant contract number, vendor number, and certificate of authorization number of the firm (when plans are prepared by a consultant), shall be shown as described in Chapter 3 of this volume.

If shop drawings are anticipated, the name(s) and address(es) of the Delegated Engineer(s) for shop drawing review(s) shall be shown on the right side of the sheet.
29.3 Tabulation of Quantities and Standard Notes

The tabulation of quantities sheet lists the item numbers, description and quantity of materials. This sheet shall be placed behind the key sheet in plans assembly.

Pay item numbers shall be listed in numerical order. Provisions shall be made to show the original and final quantities per sheet. Pay item notes and general notes that refer to item numbers, description of work to be performed and quantity estimates shall also be shown on this sheet. If space is limited, notes may be shown on a General Notes Sheet.

On contracts with multiple Financial Project ID's, or Federal Aid and non-Federal Aid quantities, provisions shall be made to tabulate and summarize their respective quantities.
29.4 General Notes

General notes pertaining to ITS may be shown on a separate plan format sheet. The general notes sheet lists special ITS design information that is generally not covered in the FDOT Standard Specifications, Supplement or Special Provisions. This sheet shall be placed behind the tabulation of quantities in the plans assembly. On minor projects, general notes may be combined with the tabulation of quantities sheet.
29.5 Plan Sheets

29.5.1 Format and Scale

ITS Plans shall be prepared on standard plan format. The scale shall be such that all details are clear and legible. See the requirements of Section 10.1 of this volume as a guide. A north arrow and scale shall be shown at a point of maximum visibility on the sheet.

29.5.2 Required Information

The basic information requirements include roadway geometrics, project limits, street names, construction stationing or milepost, curb and gutter, drainage inlets, sidewalks and right of way lines as similarly required on the plan portion of the roadway plan-profile sheets. Those underground and overhead utilities, signing structures, and lighting structures that may cause construction conflicts with ITS components shall be shown. All locations, including existing trees, should be checked for potential conflicts.

If letter type plans are utilized, the table should include at a minimum the device ID, description, milepost, offset, and a comment field. Add an extra column to the table if GPS coordinates are provided for the devices.

All equipment shown on the plan shall be clearly labeled and their respective pay item numbers and quantity indicated. In addition, the following plan elements should be shown:

1. Cabling, fiber optic splicing, and interconnects.
2. System communication devices.
3. Electrical power service equipment and interconnects.
5. Structure-mounted or ground-mounted field cabinets for system electronics, maintenance service points, and interconnect.
29.5.2.1 Dynamic Message Sign

Plans for a DMS installation should illustrate the location, placement, and typical details of the following components:

1. DMS display enclosure.
2. DMS controller.
3. DMS support structures (including external walkways, safety railings, ladders, etc.).
4. DMS mounting brackets and hardware.
5. A ground-level access point for maintenance personnel to perform diagnostic work on the sign.

29.5.2.2 Highway Advisory Radio

The design for an HAR installation should illustrate the location, placement, and typical details of the following components:

1. HAR operator workstation and central recording facility.
2. HAR antennas.
3. HAR transmitter and electronics.
4. HAR support structures, signage, and beacons.
5. HAR mounting brackets and hardware.

29.5.2.3 Video Display Equipment

Provide mounting and installation plan sheets for each color video monitor, flat panel display, and rear projection video unit in the video display system. Depict in the mounting plans detailed structural mounting information, including support structures, wall attachment methods, and the weights of the display units. Provide cable routing plan sheets and diagrams for the devices, along with maintenance/service points and structural certification.

The plans should illustrate the location, placement, and typical details of the following video display system components:

1. Video display controller.
2. Operator workstations.
3. Encoders, decoders, multiplexers, and routing equipment.

Develop sheets that detail cross-sections and elevations for all modifications to existing wall systems in the TMC facility and submit them to the Engineer.

For the rear projection video unit mounting and installation plans, include details that illustrate stacking configuration and support design, along with a ventilation and climate control plan. Provide cable routing plans that include detailed connection diagrams for individual and stacked configurations.

29.5.2.4 Network Devices

Plans including network devices should illustrate the following system attributes:
1. System diagrams illustrating network and device interconnect.
2. General network topology.
3. Notes regarding any special configurations or options for specific devices that are required to achieve a specific system function.

29.5.2.5 Fiber Optic Cable and Interconnect

The plans for fiber optic cable systems should illustrate the location, placement, and typical details of the following components:
1. Fiber optic conduits.
2. Fiber optic cables.
3. Fiber optic splices and terminations.
4. Fiber optic cable designating system.
5. Fiber optic cable access points.
29.5.2.6 Vehicle Detection and Data Collection

The plans for vehicle detection systems should illustrate the location, placement, and typical details of the following components:

1. Diagrams illustrating detection system interconnect.
2. General network topology.
3. Notes regarding any special configurations or options for specific devices that are required to achieve a specific system function.
METRIC PRACTICE

GENERAL

This Appendix was originally included in the Metric PPM and was used as guidelines for the development of Metric plans. This was a useful tool especially for the English to Metric conversion of design information. This Appendix has now been included in the English PPM as a tool for use in cases where the designer may need to obtain information from Metric plans. This may provide the designer some insight as to how those Metric plans were developed.

SUMMARY OF RULES

1. Convert values related to surveys, right of way and other geometric alignment using the U. S. Survey Foot taken to a minimum of 8 decimal places:

\[
1 \text{ foot} = \frac{12 \text{ inches/foot}}{39.37 \text{ inches/meter}} = 0.3048 \text{ meters}
\]

For other direct mathematical conversions use the SI definition:

\[
1 \text{ foot} = 0.3048 \text{ meters}
\]

2. Display direct mathematical (soft) converted values to the nearest 0.001 m or 1 mm.

3. Do not use commas to separate digits if a number has more than 4 digits. For numbers with more than 4 digits either right or left of the decimal, leave a space when practical. (Where the displayed number must be used in a mathematical operation on a computer the space may not be recognized properly and should not be used).

Example: 10 000 or 0.609 35 or 13 471.359

4. To the extent practical, use the following rules for dimensioning roadway plans:

a. For dimensions in meters, display values to at least one decimal place.
b. For dimensions in millimeters, display values as whole numbers with no decimal place.

c. Do not use the centimeter.

d. Using the above rules, do not show the unit symbols "m" and "mm" unless needed for clarification. Show even dimensions in meters with a decimal and following zero digit, e.g. 300.0 to avoid confusion with 300 mm.

5. If a dimensioned item has a numerical quantity that is part of a group of numbers in a different range, select the unit that most adequately covers the range without unduly large or small numbers. For example, if 300 mm is part of a group of numbers shown in meters, show it as 0.3 m.

6. Show long dimensions, including all horizontal and vertical geometry, wall lengths, bridge span lengths and box or three sided culvert lengths, spans and heights in meters.

7. In general, show cross section dimensions of structural members in millimeters. This will normally include most drainage structures (except box culverts), drainage pipe, and special drainage structure details. (Note: The actual size of drainage pipe and standard drainage structure boxes will remain the same. However, label these items in nominal size based on 1" = 25 mm. Example: Label 24" pipe as 600 mm pipe; Label a 4' diameter structure as a 1200 mm structure.)

8. Show pavement thickness descriptions in millimeters.

9. Use 0.1 m for both base extension on rural sections (formerly 3") and for stabilization extension on curbed sections (formerly 6").

10. On typical sections, show type of curb, "E" or "F", not the dimension.

11. As a general rule, display metric dimensions to one more decimal place than the corresponding dimension in English units:

   a. Typical Section Elements, including lane widths and shoulder widths - in meters, generally to 1 decimal place.

   b. Horizontal control points on plans, including survey centerline, baseline, intersections and alignment - in meters to 3 decimal places. The normal station interval for centerlines and baselines is 100 meters. (1 + 00.000 = 100
c. Vertical alignment control points, (PVC, PVI, PVT) and profile grade elevations - in meters to 3 decimal places.

d. Profile Grade - in percent to 4 decimal places.

e. Proposed flow lines - in meters to 2 decimal places.

f. Manhole tops and grate elevations - in meters to 2 decimal places.

g. Ditch elevations - in meters to 2 decimal places.

h. Box Culvert or Three-sided Spans and Heights - in meters to 1 decimal for new construction; in meters to 2 decimal places for extensions of existing box culverts originally constructed to English dimensions.

12. Where practical, round short radius curves (<150.0 m), including curb returns and control radii, to the nearest meter. Round longer radius curves to the nearest 5 meters. (See attached tables.)

13. Display alignment bearings and delta angles in curve data in degrees, minutes and seconds, rounded to the nearest second.

14. Omit "degree of curvature" from curve data. It has no definition in the metric system. Instead, use the radius definition. Equations:

\[
\text{Tangent } T = R \tan \left( \frac{\Delta}{2} \right) \\
\text{Length } T = R \ (\Delta \text{ in Radians}) \\
\text{Long Chord } LC = 2 \ R \ \sin \left( \frac{\Delta}{2} \right)
\]

15. On resurfacing projects, hard convert typical section dimensions (lane widths, shoulder widths, etc.) where existing conditions permit. Exception: Use direct mathematical (soft) conversion (Rule Number 2) for existing pavement widths in curbed sections, existing right of way widths, and existing median widths.
16. Continue to post sign messages for speed limits and distances in English units. Note: The posted speed for curb and gutter sections with design speed of 80 km/h (corresponds to 50 mph), should not exceed 45 mph.

17. A "hard" metric project is defined as one where metric standard index drawings and metric specifications are used, and the design complies with adopted metric criteria.

18. Beginning with metric projects express slope ratios in vertical to horizontal (V:H) format. For example, show roadside slopes as 1:6, 1:4, rather than past convention as 6:1 or 4:1.

19. As a general guideline for new construction and reconstruction, show cross sections in 20 meter intervals for urban projects and 50 meter intervals for rural projects. Project specific factors may dictate greater or lesser intervals.

20. When project limits are identified by kilometer point location on the Key Sheet, show the equivalent milepost using direct mathematical conversion.

\[(\text{example: } \text{kp} 1.609 = \text{MP} 1.000)\]

21. Label existing and proposed utilities in metric. Use the FDOT Basis of Estimates Handbook utility pay item list of metric sizes as a guide.

**PLAN SCALES**

<table>
<thead>
<tr>
<th><strong>ENGLISH SCALE</strong></th>
<th><strong>METRIC SCALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; = 2'</td>
<td>1: 25</td>
</tr>
<tr>
<td>1&quot; = 5'</td>
<td>1: 50</td>
</tr>
<tr>
<td>1&quot; = 10'</td>
<td>1: 100</td>
</tr>
<tr>
<td>1&quot; = 20'</td>
<td>1: 200</td>
</tr>
<tr>
<td>1&quot; = 40'</td>
<td>1: 400 or 1: 500</td>
</tr>
<tr>
<td>1&quot; = 50'</td>
<td>1: 500</td>
</tr>
<tr>
<td>1&quot; = 100'</td>
<td>1: 1000</td>
</tr>
<tr>
<td>1&quot; = 200'</td>
<td>1: 2000</td>
</tr>
<tr>
<td>1&quot; = 400'</td>
<td>1: 5000</td>
</tr>
</tbody>
</table>

Plan sheet size will remain the same. The viewing area of a plan sheet will be 800 mm long on "D" size sheets and 400 mm on "B" size sheets. Allowing for open space at each side, this provides a coverage of 140 m at 1:400 scale, 350 m at 1:1000 and 700 m at 1:2000 on "B" size sheets.