

PALM BEACH COUNTY
ROADWAY
DESIGN PROCEDURES



APPROVED BY:

A handwritten signature in blue ink, which appears to read "David L. Ricks", is written over a horizontal line.

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COUNTY ENGINEER

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A. POLICIES AND PROCEDURES

1. These design procedures shall be used as applicable, to address both thoroughfare and locals roads.
2. The Roadway Production Division shall be responsible for monitoring all thoroughfare and local roadway designs.
3. Design of thoroughfare and local roads shall comply with this document, and the current editions of the Florida Department of Transportation Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, commonly known as the Florida Green Book; the Florida Department of Transportation Plans Preparation Manual; and the Florida Department of Transportation Roadway and Traffic Design Standards, commonly known as the FDOT Index. The Consultant shall inform the Roadway Production Division of any conflicts between/among these documents. The Roadway Production Division shall recommend a resolution.
4. General consistency and clarity should be a top priority in the presentation of plans. To promote consistent practices with microstation files, the Consultant shall comply with the following:
 - a. New microstation files will be created using a seed file provided by Palm Beach County Engineering to ensure uniform working units configuration.
 - b. Custom menus addressing line styles, line weights, text sizes, etc., for roadway design, survey, and right-of-way work will be provided to ensure compliance with CADD System Design Guidelines. (See Appendix F)
 - c. Standard sheets (Title, Plan and Profile, Drainage and Cross Sections) are available from the County Engineering Department's Roadway Production Division.
 - d. One-foot resolution digital orthos should be obtained from the County Engineering Department for use by the Consultant. Release of these copyrighted materials will require acknowledgment of the rules of use by the Consultant and all such materials will be returned with the submittal of final plans.
5. Plans shall be prepared on 11" x 17" sheets using Palm Beach County Standards.
6. The Consultant shall submit a minimum of four (4) printed sets of design plans to the Roadway Production Division for each phase submittal, including PDF files, except for the final submittal.
7. All computations shall be done in accordance with Palm Beach County and State of Florida Department of Transportation Design Standards, taking into consideration the requirements of other permitting agencies, and shall be signed and sealed by the Professional Engineer preparing them. (See Appendix H)
8. All drainage systems shall be designed and constructed for ultimate roadway requirements, unless otherwise directed by the Roadway Production Division. For existing drainage systems, proof shall be provided that the system in place was actually designed,

A. POLICIES AND PROCEDURES (continued)

permitted, and constructed for the ultimate roadway. Testing may be required to establish the condition and life expectancy of the existing system for the Engineering Department to determine if replacement is required. (See Appendix B)

9. The consultant shall consult with the **Office of Resilience** (561-681-3812) to assess what implications climate change and sea level rise may have (if any), on the design and construction of the roadway project. The **Office of Resilience** is expected to provide guidance on the application of best available climate resilience, adaptation/mitigation, and sustainability principles. <http://discover.pbcgov.org/resilience/Pages/default.aspx>
10. The Consultant shall be responsible for coordination of utility locations, conflicts and conflict resolution prior to the finalization of construction plans, and in accordance with the Utility Coordination Guidelines. (See Appendix A)
11. The Consultant shall be responsible for the preparation of all permit applications, coordination with all permitting agencies, and preparation of permissible plans, as well as revisions required by the permitting agencies. A Roadway Production Division representative shall be present at all meetings with permitting agencies. Final construction plan approval shall be conditioned to the issuance of all required permits.
12. Soil borings shall be provided every 200' at a minimum, on alternating sides. Additional borings shall be done to adequately delineate the limits of muck encountered within the right-of-way. Pavement cores shall be obtained whenever existing pavement is to be reused and shall be provided every 1000', or as otherwise indicated by the Project Manager. Consultant shall compute pavement Structural Numbers to ensure that pavement design provided, complies with Palm Beach County standards.
13. Each phase submittal shall include a progress report of the project schedule and list of unresolved issues. Include a means of addressing these issues and reasons for delays.
14. The County shall monitor the plans for conformance with the Standards set forth herein and for consistency with the overall County Roadway Program. This monitoring of plans does not relieve the Consultant of his/her obligations and shall not be considered a quality control review.
15. At the completion of each review, the Consultant may be provided with a set of "marked up plans" (i.e., informal comments) from the Roadway Production Division and Traffic Division, and/or a comment letter.
16. The plans submitted for the next phase shall address all comments from the previous submittal, both formal and informal. The "marked up plans" shall also be submitted along with written responses to all formal comments. Failure to follow this procedure could result in plans being returned to the Consultant without review.
17. The use of aerials is required for all Right-of-Way Procurement Maps, Specific Survey/Topographic Survey, Drainage Maps, and Plan Sheets. Sheet layout shall be set to avoid intersections at match lines. Sheets shall be set such that north is generally to the top or to the right of the page. These aerials shall include coverage of the existing roadway extending a minimum of 600' beyond the limits of construction and/or striping.

A. POLICIES AND PROCEDURES (continued)

Stationing shall increase from left to right of the sheet, and increase from south to north and from west to east. Station equations shall be provided for the intersection of centerlines.

18. Palm Beach County Thoroughfare and Local Road Design Procedures will be updated periodically and the latest revision shall be considered a part of this document. These revisions will be determined and issued by the Director of the Roadway Production Division. The latest hard copy will be available in the Roadway Production Division reception area. It is also available for download from the Engineering Department's website at the following URL:

<http://discover.pbcgov.org/engineering/roadwayproduction/PDF/DesignStandardsFinal.pdf>

19. Design Engineer shall mean Engineer of Record (EOR).

B. SCOPE OF SERVICES

The Engineering Department's Roadway Production Division Section Managers and Project Managers shall have a Scope Meeting with the Consultant. The County's Traffic, Survey and Right-of-Way Acquisition, Divisions/Sections will also be included in the meeting. If a bridge exists on the project, a Structural Design Annual consultant shall be assigned to ~~for~~ the project and should also be invited to the meeting. This meeting shall be scheduled by the Project Manager. At this meeting, the design requirements will be set forth for the project.

The following will be addressed and/or provided by Palm Beach County at the Scope Meeting:

- a. Typical Section.
- b. Access Management Issues.
- c. Additional Turn Lane Requirements.
- d. Drainage Issues.
- e. Available Records (drainage, utilities, maintenance, existing development conditions, anticipated future development conditions, contaminated areas identified by Environmental Resources Management (ERM), etc.).
- f. Traffic Signal Design/Requirements.
- g. Palm Beach County will begin the process to provide the Consultant with:
 - An updated ownership list with copies of all right-of-way deeds and easements along the project.
 - Copies of plats in the vicinity.
 - Bridge Inspection Reports.
- h. Public Involvement Issues.
- i. Design schedule.
- j. Utility coordination needs.
- k. Specific purpose/topographic survey and right-of-way procurement map.

C. SUBMITTAL PHASES (See Appendix E, Page 9 for Bridge Submittal Phases)

PHASE I

PHASE IA – INITIAL UTILITY CONTACT PLANS

PHASE IB – TYPICAL SECTION

PHASE IC – MASTER PLAN

PHASE ID – 35% SUBMITTAL

1. Title Sheet.
2. Approved Typical Section.
3. Preliminary Drainage Map.
4. Preliminary Geometrics.
5. Specific Purpose/Topographic Survey (Preliminary 100%).
6. Benchmarks, Reference Points and Sectional Corners.
7. Right-of-Way Lines, Baseline of Survey and Centerline of Construction.
8. Preliminary Drainage Design.
9. Preliminary Profile Grade Lines (Existing and Proposed).
10. Existing Drainage.
11. Back of Sidewalk Profiles.
12. Existing Ditch/Detention Area Plan and Profile.
13. Existing Intersection Profiles.
14. Existing Cross Sections.
15. Existing Ditch Cross Sections.
16. Preliminary Right-of-Way Procurement Map (if required) (1"=40').
17. Bridge Construction Plans (See Appendix E).
18. List of Required Permits.
19. Geotech and Soil Survey.
20. Project Progress Report.
21. Red-lined plans from Master Plan Review.
22. Responses to comments letter.
23. CADD files for check of Conformance Standards.

PHASE II

PHASE IIA – UTILITY POTHOLE COORDINATION PLANS

PHASE IIB – FIRST UTILITY COORDINATION MEETING

PHASE IIC – POTHOLE UNDERGROUND UTILITIES AT POSSIBLE CONFLICT POINTS

PHASE IID – 65% SUBMITTAL

1. Phase I comments Addressed.
2. Summary of Quantities (items only).
3. Drainage Design Computations.
4. Drainage Maps.
5. Proposed Drainage in Plan.

C. SUBMITTAL PHASES (See Appendix E, Page 9 for Bridge Submittal Phases) (continued)

6. Final Geometrics.
7. Specific Purpose/Topographic Survey (Final 100%).
8. Geometric Computation Book.
9. Plateaued Intersection Sheets.
10. Final Profiles.
11. Limits of Construction.
12. Proposed Ditch/Detention Area Plan and Profile.
13. Intersection Profile Sheets.
14. Proposed Cross Sections
15. Proposed Ditch Cross Sections.
16. Existing Utilities.
17. Driveway Profile Sheets (existing and proposed).
18. Special Detail Sheets.
19. Bridge Construction Plans (See Appendix E).
20. Preliminary Signing and Pavement Marking Plans.
21. Preliminary Signal Plans (if required).
22. Proposed Right-of-Way Procurement Map (if required).
23. Preliminary Cost Estimate.
24. Project Progress Report.
25. Red-lined plans from the 35% Review.
26. Responses to Comments Letter.
27. Confirmation that all CADD standards have been complied with.

PHASE IIE – STAKE EXISTING AND PROPOSED RIGHT-OF-WAY BY PBC

PHASE IIF – FIELD REVIEW OF PROPOSED RIGHT-OF-WAY, EASEMENTS, RESTORATIONS, ETC.

PHASE IIG – RIGHT-OF-WAY DOCUMENTS

1. 100% Right-of-Way Procurement Map (if required).
2. Legal Descriptions and Sketches. (See Appendix C)

PHASE IIH – ALL PERMITS APPLIED FOR

PHASE III

PHASE IIIA – UTILITY CONFLICT RESOLUTION PLANS

PHASE IIIB – SECOND UTILITY COORDINATION MEETING (FINAL CONFLICT RESOLUTION)

PHASE IIIC – (96% SUBMITTAL)

1. Phase II Comments Addressed.
2. Special Provisions for Construction Specifications.
3. Summary of Quantities Sheet.
4. Utilities on Plan and Profile.
5. Drainage on Drainage Map and Plan and Profile Sheets.
6. Ditch/Detention Area Plan and Profile.

C. SUBMITTAL PHASES (See Appendix E, Page 9 for Bridge Submittal Phases) (continued)

7. Traffic Control Plans (if required).
8. Signing and Pavement Marking Plans.
9. Signal Plans (if required).
10. Drainage Structure Sheets (if required).
11. Special Detail Sheets.
12. Cross Sections.
13. Ditch Cross Sections.
14. Quantity Computation Book.
15. Engineers Cost Estimate.
16. Bridge Construction Plans (See Appendix E).
17. Specific Purpose/Topographic Survey (100%).
18. Red-lined Plans from 65% Review.
19. Responses to Comments Letter.
20. Project Progress Report.

PHASE IV

PHASE IVA – FINAL UTILITY COORDINATION MEETING

PHASE IVB – (100% SUBMITTAL)

1. Phase III Comments Addressed
2. All Permits Received

FINAL SUBMITTAL (INCLUDING BRIDGE PLANS)

1. One Complete Set of Signed and Sealed Plans.
2. Three (3) printed Sets of Plans with PDF files.
3. Final Cost Estimate.
4. Electronic (Excel) File of Pay Items.
5. Final Set of Special Provisions.
6. Final Specific Purpose/Topographic Survey (Signed & Sealed).
7. Final Right-of-Way Procurement Map (Signed & Sealed).
8. One Signed and Sealed Geometric Computation Book.
9. One Signed and Sealed Bridge Computation Book (if applicable).
10. One Signed and Sealed Drainage Computation Book.
11. One Signed and Sealed Quantity Computation Book.
12. All Electronic Files (including PDF files) with Appropriate Digital Signatures.
13. All Permits.

D. PHASE DESCRIPTIONS AND OUTLINES

PHASE I

PHASE IA – INITIAL UTILITY CONTACT PLANS

See Utility Coordination Guidelines (See Appendix A).

PHASE IB – TYPICAL SECTION

Palm Beach County Standard Typical Section shall be adjusted to reflect project conditions.

PHASE IC – MASTER PLAN

- a. Include all existing Right-of-Way (ROW), historic baseline control and ROW monumentation to be tied to Palm Beach County section and geodetic control.
- b. Address all access management issues.
- c. Address sight distance at side streets and driveways.

PHASE ID – (35% SUBMITTAL)

1. TITLE SHEET

The County shall provide a Typical Title Sheet and the Consultant shall include on this sheet the road name, limits, identify what the project entails (e.g., 6 lane divided section), County project number, Commissioners names and districts, location map, project length, Engineering certification, reference to FDOT Index, index of sheets, begin project/end project stations, and general notes or reference thereto.

a. LOCATION MAP

The location map shall include the general vicinity and a delineation of the project, north arrow, section, township and range, and project limits with stationing, showing any exceptions and bridges.

b. PROJECT LENGTH

A table shall be included showing the project length in feet and miles. Include any exceptions and the lengths of any bridges within the project limits.

c. ENGINEERING CERTIFICATION

The following certification is required on the title sheet of all final plans:

I hereby certify that the attached plans and design are in substantial compliance with the Design Standards and criteria in effect on this date for the Palm Beach County Engineering Department and the State of Florida, Department of Transportation.

DATE _____

(Signed and Sealed)
PROFESSIONAL ENGINEER #

At the final submittal, each and every sheet shall be signed and sealed by the Engineer of Record.

d. FDOT DESIGN STANDARDS AND SPECIFICATIONS

The latest editions shall be used for the design and shall be so referenced.

e. GENERAL NOTES

The following General Notes, at a minimum, shall be included on the plans where relevant:

1. Prior to the commencement of any excavation, the Contractor shall comply with Florida Statute 556.105 for the protection of underground gas pipelines.
2. Grades shown are finished grades, unless otherwise noted.
3. Benchmark datum referenced to the North American Vertical Datum 1988 (NAVD 88).
4. Existing Section corners, Quarter Section Corners, Property Corners, Palm Beach County Survey Control Monuments and all other permanent monuments located within proposed construction are to be referenced prior to construction and reset after construction by a Professional Surveyor and Mapper with a monument bearing either the Florida license number or certificate of authorization number of the party in responsible charge. Palm Beach County shall be notified upon completion and provided with field notes, certified corner records and all supporting information prior to final certification of the project.
5. Unless otherwise shown, all existing drainage structures within the limits of construction are to be removed.
6. Utilities are to be adjusted by others unless otherwise noted.
7. The location of the existing utilities shown in the plans is approximate only; the exact locations shall be determined by the Contractor prior to the start of construction. In addition, the Contractor shall be responsible to verify if "other" utilities (not shown in the plans) exist within the area of construction. Should there be utility conflicts, the Contractor shall inform the Engineer and notify the respective utility owners to resolve utility conflicts and utility adjustments, as required
8. All utility companies within the project limits shall be listed with contact person and phone number, as follows:

CONTACT PERSON	UTILITY	PHONE NUMBER
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9. Utility locations may also be determined by calling 811 Sunshine One-Call and the respective utility company.
10. Stations and offsets refer to the centerline of construction, unless otherwise noted.
11. Intersecting roads and driveways are to be graded as directed by the Engineer, unless otherwise noted.
12. Maintenance of Traffic shall be in accordance with current Florida DOT Standards and the Manual on Uniform Traffic Control Devices.

13. All pipes shall be in accordance with Florida DOT and Palm Beach County requirements, and shall be a minimum 18" diameter within County right-of-way.
14. All inlet drainage structures shall have a minimum 2' sump, except control structures. Variation from this requirement may be allowed in limited circumstances, such as to avoid utility conflicts. Weep holes shall not be a part of these sumps.
15. Bubble up structures are not to be used unless approved by the Roadway Production Division director.

2. TYPICAL SECTION

The Typical Section furnished at the Scope Meeting, as modified for the project, shall be a part of this and all future plan submittals. The ultimate typical section shall also be included. The design speed and pavement section shall be shown. Typical sections shall include location of profile grade line (PGL), and alternate pavement sections to be utilized at the option of the Contractor. The alternate sidewalk detail and a detail for placement of guardrail should also be included on this sheet, if relevant.

3. PRELIMINARY DRAINAGE MAP

- a. Drainage maps at a scale of 1" = 200' (11" x 17" sheets) shall be supplied for every project on aerial photographs.
- b. The plan view of the preliminary drainage map shall show the existing drainage system including outfalls and pipes, and shall also include section lines and corners, identification of canals maintained and design high water elevations of canals, limits of project, stationing, road center lines, identification of all adjacent and intersecting roadways, intersecting street center lines, intersecting street profile elevations at 100' intervals to one point past the drainage divide and a north arrow on each sheet.
- c. The preliminary drainage map in the profile view shall include the limits of the project, stationing, canals, and all existing drainage facilities. Also, indicate the maintained water elevation.

4. PRELIMINARY GEOMETRICS (PLAN AND PROFILE SHEETS)

- a. The plan and profile sheets shall be prepared on 11" x 17" sheets to a scale of 1" equals 40' horizontally, and 1" equals 4' vertically.
- b. The preliminary geometrics shall be shown on aerial photographs. This should include the geometrics for survey baseline, centerline of construction and right-of-way lines including stations, offsets from centerline of construction, begin and end project stations, description of monumentation found or set (including State Plane Coordinates), curve data, angle points, bearings and ties to section lines.
- c. All plan and profile sheets shall include a north arrow and drawing scale at the upper right corner of the sheet.

- d. All existing utilities shall be shown in the plan view with dashed lines. Indicate ownership, material and size of each underground utility.
 - e. Match lines are required when plans match at an uneven station or when plan sheets are not contiguous. Show match lines, corresponding stations and sheet numbers in each case. Layout should be such that match lines do not occur at intersections.
5. BENCHMARKS, BASELINE CONTROL POINTS (REFERENCE POINTS) AND SECTION CORNERS (PLAN AND PROFILE SHEETS)
- a. Permanent benchmark and baseline control point spacing shall not exceed 1,000 feet and shall be located outside the limits of construction. Reference to the nearest benchmark shall be shown on each plan and profile sheet. Include station/offset, physical description and elevation, using the following format: ELV. xx.xx (NAVD88).
 - b. Reference points reflecting ties to baseline of survey shall be included for all baseline control points. Spacing of reference points shall not exceed 1200 feet. Baseline control point shall include Florida State Plane Coordinates and associated notes as required by County Wide PPM CW-O-058. These ties shall be located outside the limits of construction. A separate sheet including all project ties is required.
 - c. Sectional corners shall be shown on all relevant sheets. Dimensioning shall be provided from the centerline and baseline to all section lines within the plan limits.
6. RIGHT-OF-WAY LINES, BASELINE OF SURVEY AND CENTERLINE OF CONSTRUCTION (PLAN AND PROFILE SHEETS)
- a. The proposed right-of-way lines shall be shown for the proposed roadway, as well as existing right-of-way lines and easements (dashed/using correct line style) for example; intersecting streets and canals. Dimensions to the right-of-way lines from the centerline of construction along with stations and offsets at all changes in direction of the right-of-way line shall be shown on all plan and profile sheets. Whenever right-of-way procurement maps are not provided, the Consultant shall show existing road right-of-way lines on all plan sheets and/or the supporting survey incorporated into the plans.
 - b. The centerline of construction shall be monumented, shown on the plan view and stationing shall increase from the left to the right of the plan sheet, increase from south to north and from west to east. Stationing shall be provided for intersection center lines.
 - c. The centerline of construction shall be monumented, stationed and all profiles, structures, edge of pavement, offsets, etc., shall be referenced from this line, unless otherwise directed by the Roadway Production Division.
 - d. Centerline curve data shall be provided on the drawings indicating angle point station, delta angle with direction, degree of curvature, tangent length, length of curve, radius, super-elevation rate, P.C. station and P.T. station. Where the curve extends over

more than one sheet, the curve data shall be repeated on each sheet. Curve data shall also be provided for curves not concentric with the centerline.

- e. The baseline of survey with bearings, curve data, angle point stations, ties to permanent monuments, reference to section lines, and relation to centerline of construction shall be indicated on the plans.

7. PRELIMINARY DRAINAGE DESIGN (PLAN AND PROFILE SHEETS)

Preliminary flood routing computations shall also be included with this submittal for the 25 year, 3-day storm, using the variable tailwater method. (See Appendix B for additional information.)

8. PRELIMINARY PROFILE GRADE LINES (EXISTING AND PROPOSED) (PLAN AND PROFILE SHEETS)

- a. The profile shall be set as per the drainage requirement standards (requiring at least one through lane in each direction to be above the 25 year, 3-day storm stage for the roadway being built), or as set by the back of sidewalk profiles if so directed by the Roadway Production Division.
- b. Profile grade lines shall be labeled and slopes shall be shown on all profiles to two decimal places.
- c. Elevations are required at the beginning and end of each sheet, point of vertical intersection (PVI), point of vertical curve (PVC), and point of vertical tangency (PVT), and at 100 foot stations. The k value and curve length shall also be indicated. In vertical curves and super-elevated sections, proposed elevations shall be shown at every 50-foot station, and high and low point stations and elevations shall be shown.
- d. Maintain a desirable distance of 300 feet (250 ft. minimum) between PVIs and 0.3% minimum grade on roads with curb and gutter.
- e. If super elevation is required, the edge of pavement profile shall be shown through the super elevation transition, including beginning and end stations.
- f. Special edge of pavement profiles is required wherever elevations in sag curves result in slopes flatter than 0.3%.
- g. The existing (dashed lines) and proposed (solid lines) grades at the profile grade lines (PGL) shall be shown in the profile view. The proposed lines shall be heavier.
- h. All available utility information shall be shown in the profile view.

9. EXISTING DRAINAGE IN PLAN AND PROFILE

All existing drainage shall be shown in the plan and profile views with a dashed line. Pipe sizes and materials shall be included in the plan view. Existing drainage infrastructure are to remain unless otherwise noted on the plans.

10. BACK OF SIDEWALK PROFILES

Back of sidewalk profiles shall be a requirement in cases of new construction in urban areas. If required, these profiles shall be submitted prior to setting the preliminary profile grade lines. Back of sidewalk profiles shall be used to set the proposed grades unless the drainage condition controls, and shall also include existing elevations at the right-of-way line, proposed back of sidewalk grades, finished floor elevation of buildings within 25 feet of the proposed right-of-way, elevation and limits of intersecting streets, adjacent parking lots, driveways, walls, etc. The proposed profile shall be the result of an existing condition best fit and meeting the requirement of one through lane in each direction to be above the 25 year, 3-day storm stage.

A field review with County staff may be required, at the discretion of the Roadway Production Division.

11. DITCH/DETENTION AREA PLAN AND PROFILE (EXISTING)

Ditch/detention area plan and profile shall include existing plan and elevation, baseline of survey, centerline of construction, north arrow, and scale. Existing outfalls shall also be shown.

12. EXISTING INTERSECTION PROFILES

Plans shall include existing profiles for all intersecting roads and major driveways. Existing centerline of pavement and swale profiles shall be included, up to 20' past the "match existing" point or the drainage divide, whichever is furthest.

13. EXISTING CROSS SECTIONS

Existing cross sections shall be provided at a minimum of each 100' station. In areas of super-elevation, sections shall be shown at 50' intervals. Cross sections shall show the right-of-way lines, centerline of construction, survey baseline (including offset from the centerline) vertical and horizontal scales, existing ground as a dashed line extending to 25' outside of the proposed right-of-way, and any walls, fences, trees or hedges within this 25' area. The station, for which the cross section is prepared along with the elevation grid, shall be shown on the right side. Cross sections shall be plotted at a scale **of 1" equals 10'** vertically and **1" equals 20'** horizontally, on grid paper. The existing elevation shall be shown at the centerline of construction just below the cross section.

14. DITCH CROSS SECTIONS (EXISTING)

These shall follow the same Standards as the Roadway Cross Sections and shall be shown on separate sheets tied to a baseline.

15. PRELIMINARY RIGHT-OF-WAY PROCUREMENT MAPS & SPECIFIC PURPOSE/ TOPOGRAPHIC SURVEY (See Appendix C)

a. Right-of-Way Procurement Maps shall be required for all projects, unless otherwise directed by the Roadway Production Division. A Specific Purpose/Topographic Survey must be produced for all projects. There are supplemental requirements included in this publication, under the heading Right-of-way Procurement Map. (See Appendix C.) Please refer to these also.

- b. Right-of-Way Procurement Maps and Specific Purpose/Topographic Surveys shall utilize updated Palm Beach County aerial photography or raster images as a base for delineating property lines related to the proposed right-of-way lines. Sufficient survey information shall be shown on the document to enable a prudent Professional Surveyor and Mapper to locate and stake each parcel in the field. Maps are to be prepared at a scale no smaller than 1" equals 40'.
- c. Each map shall have the official seal of the Professional Surveyor and Mapper certifying that the survey meets the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in rule 5J-17.050-.052, Florida Administrative Code, pursuant to Chapter 472.027, Florida Statutes, and that the map is a true and correct representation of the land surveyed under his responsible direction and supervision.
- d. All right-of-way procurement maps shall utilize the same stationing as the construction plans to allow for easy cross reference.

16. BRIDGE CONSTRUCTION PLANS (35%)

See Bridge Design Guidelines. (See Appendix E)

17. LIST OF REQUIRED PERMITS

Provide a complete list of all the permits required for the project.

PHASE II

PHASE IIA – UTILITY POTHOLE COORDINATION PLANS

See Utility Coordination Guidelines. (See Appendix A)

PHASE IIB – FIRST UTILITY COORDINATION MEETING

See Utility Coordination Guidelines. (See Appendix A)

PHASE IIC – POTHOLE UNDERGROUND UTILITIES

See Utility Coordination Guidelines. (See Appendix A)

PHASE IID – (65% SUBMITTAL)

1. PHASE I – COMMENTS INCORPORATED

All comments from the previous review shall be addressed. Failure to do so may result in plans being returned without review.

2. SUMMARY OF QUANTITIES

- a. A Summary of Quantities sheet shall be included in the plans.

- b. Only the items for the project shall be listed for this phase. No actual quantities are required at this time.
- c. Regular roadway pay items shall include all items definitely required for the construction of the project.
- d. Contingency items shall also be indicated to cover possible issues that may arise during construction.
- e. A Palm Beach County Standard Nomenclature file is available to the Consultant. Palm Beach County Pay Items sequence and nomenclature shall be used. Add Pay items as required.

3. DRAINAGE DESIGN COMPUTATIONS (REFER TO APPENDIX B)

4. DRAINAGE MAPS

- a. Drainage maps shall show the proposed drainage system in plan view, including delineation of the contributing drainage basin, sub-basins, area of each sub-basin, outfalls, detention/retention areas (including control elevations and 25 year, 3-day storm elevations), structure numbers, pipes in solid lines, and their sizes and overland flow direction.
- b. The profile views shall include as a minimum, the proposed profile (including PVI=s and elevations), pipes and outfalls, and all drainage structures on the mainline.
- c. All proposed drainage shall be drawn using solid lines; all existing drainage shall be shown using dashed lines.

5. PROPOSED DRAINAGE IN PLAN

- a. All drainage structures, drainage pipes and french drains (exfiltration trenches) shall be shown and labeled in the plan view. This shall include structure types and numbers, trench dimensions, and pipes (size and material).
- b. Drainage pipes and structures shall be located for the ultimate typical section.
- c. Main line pipes shall be sized for the ultimate section.

6. PROPOSED GEOMETRICS (PLAN AND PROFILE SHEETS)

- a. Proposed geometry of all intersecting streets shall be shown
- b. The limits of driveway restoration/reconstruction, type of pavement, limits of 6" concrete sidewalk and drop curbs shall be shown.
- c. All curb return radii shall be indicated. PC and PT stations and elevations at the edge of pavement shall be shown. High points and low points within the curb return shall be noted with stations, offsets, and elevations at the edge of pavement.

- d. All sidewalks shall be located in accordance with the typical section. In curb sections, sidewalk curb ramps shall be provided in accordance with the Florida DOT Standards.

7. GEOMETRIC COMPUTATIONS SUBMITTAL

The Geometric Computation submittals shall include all the necessary computations required to define (i) the centerline and PGL alignment, and (ii) super-elevation and super-elevation transitions (all transitions and elevations shall consider the ultimate section).

8. PLATEAUED INTERSECTION SHEETS

- a. All intersections of two thoroughfare roadways shall be plateaued on separate plan sheets.
- b. All approaches shall be plateaued considering the ultimate expanded intersection.
- c. Sheets shall include a north arrow, street names, centerlines, baselines, edges of pavement, traffic separators, curb and gutter, all lane lines and the necessary number of spot elevations to construct the plateaued intersection.
- d. Special profiles shall be shown as required, including those for the existing centerlines, proposed centerlines, lane lines, and edges of pavement.
- e. Elevations and profiles shown on plateau intersection sheets shall not be duplicated on the plan and profile sheets.
- f. Match lines will be used for cross-referencing.

9. PROPOSED PROFILES (PLAN AND PROFILE SHEETS)

Proposed profile grade line and any special profiles including station, offset, slopes, and elevation, shall be shown.

10. LIMITS OF CONSTRUCTION

The limits of work, outside of the right-of-way, shall be indicated in the plan view and cross sections. The line indicating this limit shall be labeled as the "limit of construction". This shall include:

- (i) Toe or top of slope or limits of trench required to construct underground facilities, whichever is greater.
- (ii) Limit of driveway construction.
- (iii) Limits of work on side streets.

Temporary construction easements and restoration agreement lines shall not be shown on the final construction plans.

11. DITCH/DETENTION AREA PLAN AND PROFILE (PROPOSED)

The ditch/detention area plan and profile shall include the proposed plan and elevations, and typical section.

12. INTERSECTION PROFILES SHEETS

The plans shall include the proposed profiles and existing grades for all intersecting public rights-of-way, and major driveways. The centerline of pavement, gutterline and swale profiles shall be included.

13. PROPOSED CROSS SECTIONS

Proposed cross sections shall show the proposed template, PGL elevations, soil borings, and the amount of cut, fill, and unsuitable material, where applicable. The cut and fill quantities shall be shown on the right side of the cross section sheet both in square feet for each cross section and cubic yards for the actual volumes between cross sections. Pavement widening shall be dimensioned and existing cross slopes of remaining pavement shall be labeled. Quantities for any unsuitable material shall be shown on the left side of the sheet in the same manner as for the cut and fill.

14. DITCH CROSS SECTIONS (PROPOSED)

These shall follow the same Standards as the Cross Sections.

15. EXISTING UTILITIES

Existing utilities shall be shown in plan and profile views based on the pothole information from Phase IIC.

16. DRIVEWAY PROFILE SHEETS (EXISTING AND PROPOSED)

- a. Partial sections shall be provided at all driveways. Driveway profiles shall extend from proposed outside edge of pavement to 25' beyond the proposed right-of-way line, or to 10' beyond the limit of driveway construction, whichever is greater.
- b. Driveway profiles shall carry the same information as required for intersection profiles.

17. SPECIAL DETAIL SHEETS

- a. Detail sheets shall include all items proposed for construction which do not appear in the Florida DOT indices and all modifications thereto.
- b. Also required are details for the drainage control structures, including but not limited to, weir elevations, weir widths, orifice details, etc.

18. BRIDGE CONSTRUCTION PLANS (65%) (See Appendix E)

19. PRELIMINARY SIGNING AND PAVEMENT MARKING PLANS

- a. Signing and pavement marking plans are to be included as a separate set of plans, with their own title sheet. They shall be in accordance with the Palm Beach County Traffic Division Standard, latest edition.
- b. This work shall be submitted to the Roadway Production Division with the 65% roadway plans.

20. PRELIMINARY SIGNAL PLANS (IF REQUIRED)

- a. The Traffic Division may require that signal plans be prepared by the Consultant. If so, this will be made clear at the Scope Meeting.
- b. Any signal installation or modification plans are to be included as a separate set of plans, with its own title sheet.
- c. Signal plans shall be submitted to the Roadway Production Division with the 65% roadway plans.

21. SPECIFIC PURPOSE/TOPOGRAPHIC SURVEY & RIGHT-OF-WAY PROCUREMENT MAP (See Appendix C)

- a. The proposed Specific Purpose/Topographic Survey and Right-of-Way Procurement Maps shall have addressed all previous comments.
- b. Right-of-Way Procurement Map parcels shall be identified as follows:
 - 100 Series for Right-of-Way, (include Right-of-Way Easements).
 - 200 Series for all Permanent Easements, Embankment, Drainage, Utility, etc.
 - 300 Series for all Temporary Construction Easements.
 - 400 Series for all Relocatable Easements.
- c. Provide a table listing all parcels required with corresponding stations and offsets.

PHASE IIE – STAKE EXISTING AND PROPOSED RIGHT-OF-WAY

- a. The right-of-way lines shall be staked by the PBC's Surveyor and Mapper in preparation for field inspection.
- b. Staking should not occur too far in advance of the field trip to reduce the possibility of the stakes being removed by others prior to the field review.

PHASE IIF – FIELD REVIEW OF PROPOSED RIGHT-OF-WAY, EASEMENTS, RESTORATIONS, ETC.

- a. A field review shall be conducted with the Roadway Production Division and the Right-of-Way team to review the proposed right-of-way takes and analyze the need for the temporary construction easements.

- b. Alternate construction methods shall be analyzed to eliminate the need for the easements, if feasible.
- c. Necessary measures shall be taken to avoid existing signs, trees, hedges, etc., where feasible.
- d. Special attention shall be paid to safe corners at intersections. Provisions should be made to accommodate signal poles, especially mast arms.

PHASE IIG – RIGHT-OF-WAY DOCUMENTS

- 1. 100% RIGHT-OF-WAY PROCUREMENT MAP & SPECIFIC PURPOSE/TOPOGRAPHIC SURVEY (See Appendix C)
 - a. The final Right-of-Way Procurement Map should incorporate all previous comments. The Specific Purpose/Topographic Survey is to be delivered signed & sealed.
 - b. Any required permanent and temporary construction easements, shall also be shown.
- 2. LEGAL DESCRIPTIONS AND SKETCHES (See Appendix D)
 - a. Legal descriptions and sketches will be required on parcels to be acquired, including but not limited to, right-of-way (including right-of-way easements), permanent easements, temporary construction easements, embankment easements and drainage easements. Parcel sketches will agree with information on the right-of-way procurement map and be tied to a pair of well-established and monumented Geodetic Control Point or a pair of monumented Government Corners. All legal descriptions and sketches shall have the official seal and registration number of the Land Surveyor and Mapper who prepared the document.
 - b. The legals and sketches shall reference the centerline of construction for stationing and offsets and clearly reference the plans by project name, number and date.
 - c. State Plane Coordinates must be provided at the POB and one additional corner on the sketch in accordance with County Wide PPM # CW-O-058. All notes associated with the use of State Plane Coordinates must be shown.

PHASE IIH – ALL PERMITS APPLIED FOR

- a. All permits shall be applied for upon receipt of 65% review comments.
- b. Required permits are the responsibility of the Consultant and may include, but are not limited to, SFWMD, LWDD (other Water Control Districts), FDEP, FDOT, ERM, Municipalities (vegetation and excavation permits), and Army Corps of Engineers.
- c. The Consultant shall provide Palm Beach County with complete copies of the packages submitted to the permitting agencies. This includes responses to comments from the review process.

PHASE III

D. PHASE DESCRIPTIONS AND OUTLINES (continued)

PHASE IIIA - UTILITY CONFLICT RESOLUTION PLANS

See Utility Coordination Guidelines. (See Appendix A)

PHASE IIIB – UTILITY COORDINATION MEETING

See Utility Coordination Guidelines. (See Appendix A)

PHASE IIIC – (96% SUBMITTAL): PHASE IIE THROUGH PHASE IIH SHALL BE COMPLETED PRIOR TO THIS SUBMITTAL

1. PHASE IID – COMMENTS INCORPORATED

All comments from the previous review shall be addressed. Failure to do so may result in plans being returned without review.

2. SPECIAL PROVISIONS FOR CONSTRUCTION SPECIFICATIONS

The Consultant shall be required to provide the County with any special provisions required for the particular project, whenever clarification or special conditions need to be addressed.

3. SUMMARY OF QUANTITIES SHEET

- a. Quantities shall be provided for all the items required for the project.
- b. Pay item footnotes shall be included.
- c. This sheet shall include a Summary of Earthwork quantities.
- d. Standard pay items nomenclature for Roadway Production Division shall be utilized.

4. UTILITIES ON PLAN AND PROFILE

- a. All pothole information shall be incorporated.
- b. Any conflict resolution measures shall be addressed.
- c. Updated utility contact list.

5. DRAINAGE ON DRAINAGE MAPS, AND PLAN AND PROFILE SHEETS

Pipe flow line elevations shall be shown. Yard drains shall be included where necessary.

6. DITCH/DETENTION AREA PLAN AND PROFILE

Address all agency requirements and permit conditions, including littoral shelves.

7. TRAFFIC CONTROL PLANS (IF REQUIRED)

- a. Traffic control plans (maintenance of traffic plans) shall be provided if required by the Roadway Production Division or as a permit condition from a review agency.

D. PHASE DESCRIPTIONS AND OUTLINES (continued)

b. Florida DOT Standards shall be followed for items to be included in this plan.

8. SIGNING AND PAVEMENT MARKING PLANS

The plans shall include a tabulation of all the quantities required.

9. SIGNAL PLANS (IF REQUIRED)

a. Any specifications shall be provided at this stage.

b. The plans shall include a tabulation of all the quantities required.

10. DRAINAGE STRUCTURE SHEETS

a. All drainage pipes and French Drains (exfiltration trenches) shall be shown including the length of pipe, type of material, and flow lines.

b. All inlet drainage structures should have a 2' sump.

c. All structures shall be shown, including location (center line of structure and offset), elevation (pipe flow lines, bottom, grate, and edge of pavement), and type of structure. Reference shall be made to the applicable Florida DOT indices.

d. All existing utilities shall be shown including ownership, size, depth, and conflict resolution (if required).

11. SPECIAL DETAIL SHEETS

A final check shall be made to confirm all special details and coordination with applicable plan sheets.

12. CROSS SECTIONS

A final check shall be made of all the volumes for cut, fill and unsuitable material.

13. DITCH CROSS SECTIONS

A final check shall be made of all the volumes for cut, fill and unsuitable material.

14. QUANTITY COMPUTATION BOOK

a. A detailed computation book shall be submitted.

b. It shall detail all quantity computations and locations on a sheet by sheet basis.

c. It shall be in sufficient detail to justify the quantities as shown on the Summary of Quantities sheet.

d. Quantities for the signing and pavement marking plans and signal plans should also be included.

e. Quantities for any bridges shall also be included.

15. ENGINEER'S COST ESTIMATE

- a. A cost estimate shall be provided using present average unit costs which are available from the Roadway Production Division. Unit prices that are based on very low quantities, may be adjusted upward.
- b. It shall include all items listed in the Summary of Quantities for the roadway plans, signing and pavement marking plans, signal plans and bridge plans.

16. BRIDGE CONSTRUCTION PLANS (96%)

See Bridge Design Guidelines (See Appendix E).

PHASE IV

PHASE IVA – FINAL UTILITY COORDINATION MEETING

See Utility Coordination Guidelines. (See Appendix A)

PHASE IVB – (100% SUBMITTAL)

1. PHASE III – COMMENTS INCORPORATED

All comments from the previous review shall be addressed. Failure to do so may result in plans being returned without review.

2. ALL PERMITS RECEIVED

All permits should be in hand prior to this submittal.

FINAL SUBMITTAL

The Final Submittal shall consist of all the following documents:

1. One complete set of 11" x 17" signed and sealed plans with each sheet signed and sealed by a Professional Engineer for the roadway construction plans, the signing and pavement marking plans, traffic signal plans and the bridge/structural plans. The right-of-way procurement maps shall be signed and sealed by a Registered Surveyor & Mapper.
2. Three (3) complete sets of plans (11" x 17") and supporting PDF files.
3. A signed and sealed final cost estimate. This also shall be provided in electronic format on disk.
4. A summary of all pay items, units and quantities in accordance with the Palm Beach County Standard Nomenclature shall be submitted in electronic format (Excel readable) for use in preparing construction contract documents.
5. A set of Special Provisions if required for the project, on disk in Word format.

6. One (1) Signed and Sealed Right-of-Way Procurement Map and Specific Purpose/Topographic Survey.
7. A Signed and Sealed Geometric Computation Book.
8. A Signed and Sealed Bridge Computation Book.
9. A Signed and Sealed Drainage Computation Book.
10. A Signed and Sealed Quantity Computation Book.
11. An electronic copy on disk with the complete design (in Micro station format following Palm Beach County CADD System Design Guidelines) for the roadway design, signing and pavement marking plans, traffic signal plans, bridge plans, right-of-way procurement maps and specific purpose/topographic survey. In addition, plot files of all drawing sheets shall be delivered in both Micro-station and PDF formats.
12. All permits required for the project. Submit hardcopy and PDF formats.

**UTILITY COORDINATION GUIDELINES
INITIAL UTILITY CONTACT**

1. Consultants are required to prepare Initial Utility Contact Plans and submit them to Roadway Production in PDF format. These plans, including the approved typical section, shall be submitted to Roadway Production as soon as aerials are received and after centerline, proposed right-of-way lines, and intersecting street names are shown on plans (PHASE IA). The Roadway Production Utility Coordinator will determine which utility companies should be contacted. The PBC Traffic Division shall be included in all utility coordination.
2. In an Initial Contact Letter (ICL), the Utility Coordinator requests available As-Builts, and sends the Initial Utility Contact Plans to the utility owners, requiring one (1) set to be marked and returned within a maximum of thirty (30) calendar days, or a letter stating that the utility has no facilities within the limits of the project. The ICL shall include a statement that when pot holing is required, the utility will be responsible for uncovering their facilities for location by PBC (or its Consultant) and/or any non-destructive utility location services required. The ICL shall also request notification (and support documents) of any utility claims for reimbursement.
3. The Utility Coordinator forwards the marked plans and As-Builts to the Consultant within one week of receiving them from the Utility Companies.

ROADWAY DESIGN IS BETWEEN 35% AND 65% SUBMITTAL

1. The Consultant shows existing utilities and proposed drainage in plan (no backwater drainage computations are necessary at this time). An Initial Utility Conflict Matrix (list of possible conflict points), a request for a pot holing meeting, and a set of utility pot hole coordination plans for each utility company (or reproducibles) is submitted by the Consultant (PHASE IIA).
2. The Utility Coordinator provides all utility companies with the above referenced plans ten (10) working days before the utility coordination meeting.
3. The First Utility Coordination Meeting is conducted and a pot holing and survey date is set (PHASE IIB). Letter is sent to utilities confirming pot holing schedule. Letter to include statement that when potholing is required the utility will be responsible for uncovering their facilities for location by PBC (or its Consultant) and/or any non destructive utility location services required. PBC (or its Consultant) shall be responsible for marking either the Centerline of Construction or Baseline of Survey (as applicable) by painting station callouts at 100' intervals.
4. The Utility Company shall be responsible to pot hole underground utilities at possible conflict points (PHASE IIC) within twenty (20) working days of Utility Coordination Meeting. The exposed utilities shall be surveyed by PBC (or its Consultant) within ten (10) working days after notification from utilities that pot hole locations are ready. Unless otherwise agreed upon, the utility company shall locate/mark their utilities either by;
 - A 3" diameter PVC pipe on top of the utility.
 - Providing the offset and the cover depth of the utility from a physical feature (pavement, curb, etc.) and marking (painting) that physical feature.
5. No vertical drainage design is to be done until all the pot holing information has been received and transferred to the plans.

65% SUBMITTAL

All pot holing information received to date shall be included in this submittal.

ROADWAY DESIGN IS BETWEEN 65% AND 95% SUBMITTAL

1. The Consultant completes drainage backwater computations, includes the pot holing information in the plans, determines the physical placement (horizontal and vertical) of the proposed drainage pipes, and shows preliminary drainage in plan and profile sheets. The Consultants design must include the “best effort” to avoid all utility conflicts, when economically feasible.
2. The Consultant determines all unavoidable points of conflict and updates the Utility Conflict Matrix.
3. The Consultant provides PBC with current plans and updated Matrix (PHASE IIIA).
4. The Utility Coordinator provides all utility companies with the above referenced plans and the updated Matrix ten (10) working days before the second utility coordination meeting.
5. The Consultant, PBC Roadway Production Division staff, and the affected Utilities conduct the second Utility Coordination Meeting (Final Conflict Resolution) to address the updated Matrix and all unavoidable points of conflict (PHASE IIIB).
6. The Consultant prepares “meeting minutes” (identifying resolved items) and a final Utility Conflict Matrix. These are submitted to PBC who shall forward copies to each utility allowing ten (10) working days for any additional comments or objections.
7. Any costs associated with changes resulting from responses received after ten (10) working days will be the sole responsibility of the Utility Company.
8. PBC in conjunction with its Consultant and the utility companies shall determine the necessity of:
 - a. An early clearing of selected areas to be included within the roadway construction contract, or
 - b. A separate clearing contract of selected areas.
9. Evaluation and discussion of forthcoming Utility Relocation Schedules (for underground and overhead facilities).

Consultant’s “Meeting Minutes” shall include a section with projected start and duration time periods.

96% SUBMITTAL

This submittal shall include all features of final drainage design, drainage structure sheets and existing utilities.

ROADWAY DESIGN IS BETWEEN 96% AND 100% SUBMITTAL

1. The Utility Coordinator sends out a "Relocation Schedule" document to all Utility Companies. This document shall request information pertaining to time/schedule for relocating and/or adding facilities. This document shall also request whether the Utility Company desires to include the work as part of the PBC bid package. Any requested reimbursement costs shall also be identified at this time. Any utilities in the area that are unaffected shall provide a letter to that effect. The Utility Company shall return completed "Relocation Schedule" within twenty (20) working days after written request.
2. Upon approval of 96% complete plans by PBC Roadway Production Division, the Consultant advises the Utility Coordinator that all requested changes have been incorporated in the plans and that the final utility coordination meeting should be conducted.
3. A complete set of roadway plans is sent to the Utility Companies with a request to review for compliance with previous agreements, to identify all contingency items, and to attend a final Utility Coordination Meeting. Any changes that take place beyond this point must be reflected in the revision box and the Utility Companies need to be notified of those changes prior to the "Pre-advertisement meeting".
4. The Final Utility Coordination Meeting (PHASE IVA) is conducted prior to the 100% Submittal. Any and all utility related contingency items should be finalized at this time. The Palm Beach County Project Manager and Utility Coordinators shall be present. The Consultant will record notes to be used in preparing the project construction specifications, and finalizing the plans for construction (including contingent utility related quantities).
5. The utility coordination is completed and the Consultant proceeds to prepare the 100% submittal.
6. Pre-advertisement meeting to include the status of utility relocation and completion.

DRAINAGE DESIGN GUIDELINES

All Thoroughfare Road Drainage Design shall comply with the Florida Department of Transportation Drainage Manual (Latest Edition) and the following guidelines:

The values and methodology presented in these guidelines and supplemental references are Palm Beach County Standards. Deviations from these guidelines shall be documented within the required Drainage Design Computation Book at each instance of deviation, and must receive written authorization from Palm Beach County.

A Drainage Design Computation Book shall be prepared and one (1) signed and sealed by the Professional Engineer in responsible charge, shall be submitted to Palm Beach County. The Drainage Design Computation Book shall include all calculations necessary to support the information required by Palm Beach County and permitting agencies.

Design and construction of all drainage systems shall be for the ultimate roadway requirements.

The drainage design shall address historical flow as obstructed or displaced by the roadway construction.

The drainage design shall include flood routing computations for the 25 year, 3-day storm event. Pipes shall be sized for the 3-year, 1-day storm event, using the Rational Method and the Florida Department of Transportation Zone 10 Rainfall Intensity Duration Frequency Curve, resulting in the hydraulic gradient being at least 1' below the top of the grate (or at grate for ditch bottom inlets located in swales with a minimum depth of 1') with all control elements in place i.e. weirs, orifices, etc. The profile grade line shall be set for the 25 year, 3-day storm peak stage (storm water pond or canal whichever is higher), accommodating at least one through lane in each direction for the roadway being built above this elevation.

SUPPLEMENTAL REFERENCES

- Florida Department of Transportation Drainage Manual (Latest Version).
- Florida Department of Transportation Roadway and Traffic Design Standards (Latest Version).
- Florida Department of Transportation Plans Preparation Manual (Latest Version).
- South Florida Water Management District Manual Volume IV.

RIGHT-OF-WAY PROCUREMENT MAP & SPECIFIC PURPOSE/TOPOGRAPHIC SURVEY

The Specific Purpose/Topographic Survey (Survey) will be prepared for graphic presentation of the topographic features collected during the field survey required in the projects survey scope of services.

On projects where a Right-of-Way Procurement Map is not being required the Survey will be prepared at a scale of 1" =20' on a 24" x 36" sheet. This scale will allow the inclusion of the baseline of survey, existing right-of-way, centerline of construction, proposed right-of-way, stations and offsets and so forth to be shown with clarity along with topography and elevations. **This Survey will be rescaled to 1" = 40' on 11" x 17" sheets and be included in the Plan Set.**

If a Right-of-Way Procurement Map is being prepared for the project the Survey may be prepared at a scale of 1" =40' on a 24" x 36" sheet and the proposed right-of-way does not have to be included on the Specific Purpose Survey/Topographic.

COVER SHEET FOR SPECIFIC PURPOSE/TOPOGRAPHIC SURVEY AND RIGHT-OF-WAY PROCUREMENT MAPS

The following information shall be clearly shown on all cover sheets:

- Name of Project.
- Project Limits.
- Project Number.
- Palm Beach County Commission Titles.
- Surveyors Report: Specific Purpose/Topographic Survey and Right of Way Procurement Map shall meet and be certified to the applicable portions of the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in rule 5J-17.050-.052, Florida Administrative Code, pursuant to Chapter 472.027, Florida Statutes and this Index.
- Bearing note – grid bearings (NAD83/90 or 83/90/98) tied to a well-established, monumented line.
- Coordinate base NAD 83/90 and associated notes (as prescribed by Palm Beach County).
- Scale Factor – to be calculated.
- Dimensions – ground distances.
- Stations and offsets must be based on ground distances.
- Field book reference.
- Computed dimensions are supported by field measurements
- Date of photography.
- Company name, and the name and registration number of the Land Surveyor and Mapper in responsible charge.
- Location Sketch showing Beginning and End Project.
- Completed Title Block using Palm Beach County supplied cover sheet.

SPECIFIC PURPOSE/TOPOGRAPHIC SURVEY

MAP SHEETS

- Begin project and End project stations, including description of physical points found or set (include state plane coordinates).
- North arrow, Stated Scale and Graphic Scale.
- Section, Township and Range.
- Show all dimensions in following fashion: Plat (P), Calculated (C), Field (F), Deed (D), Measured (M).
- All map sheets will be prepared on PBCo provided map sheet title blocks.

The monumented historic baseline of survey, existing right-of-way, and existing topographic features specified in the survey scope of services will be shown on the Survey. The historic baseline of survey will be tied to a pair of PBCo Horizontal Control Points at each end of the baseline. Stations and offsets and State Plane Coordinates and monumentation will be labeled at begin and end of historic baseline as well as PI's, PC's, PT's, PRC's and PCC's along the baseline not to exceed 1000 feet between control stations. All monumentation along the historic baseline will be referenced to the intervisible random project control monumentation.

Ties to section corners, quarter corners and other important corners shall be shown by station and offset and bearing and distance to corner. Include the type of monumentation found or set.

RIGHT OF WAY PROCUREMENT MAPS

Right of Way Procurement Maps as defined by Palm Beach County is a Specific Purpose Surveys whose purpose is to delineate the location of existing and proposed Right of Way on paper **as well as on the ground. (Based on a field survey).**

MAP SHEETS

The following information shall be clearly shown on all map sheets:

- Right-of-Way Procurements map sheets should be prepared on 24" x 36" sheet.
- Scale 1"=40'.
- North arrow, Stated Scale and Graphic Scale.
- Section, Township and Range.
- Show all dimensions in following fashion: Plat (P), Calculated (C), Field (F), Deed (D), Measured (M).
- Stations shall increase from South to North or West to East.
- Bearing note – grid bearings tied to a well-established, monumented line.
- Coordinate base NAD 83/90 or NAD 83/90/98 and associated notes (as prescribed by Palm Beach County).
- Scale Factor – to be calculated.
- Dimensions – ground distances.
- Stations and offset must be based on ground distances.
- Baseline dimensions will be balanced between County monuments.

For all Right-of-Way Procurement Maps, the historical baseline or historical centerline of Right-of-Way used for existing and/or original right-of-way acquisition must be monumented,

mathematically established and tied to the required intervisible random project control monumentation. Establish the historical baseline as the baseline of survey for the project.

Survey Baseline – If possible the baseline will be the centerline of the new right of way, or centerline of construction. If the baseline is not the centerline of construction, station and offset ties to all Control Points will be referenced to the centerline of construction. Complete centerline data, including beginning of survey station, all curve elements, bearings on all tangent lines, points of intersection station with deflection angle left or right, all intermediate control point stations, and end point station. Non tangent curves must be identified and show delta angle, arc length, radius and chord bearing or radial bearing.

Offset ties will be at right angles or radial to the baseline/centerline.

Subdivisions – Name, Plat Book, Page, Parcel Control Numbers and existing record information of all properties and boundaries of all subdivisions along the corridor will be shown with ties to the boundary and block lines. Plat dimensions, Calc. dimensions and complete lot and block information will be shown. Subdivision and side street locations shall be supported by field measurements. Subdivisions along corridor will be shown with ties to the boundaries, streets and block lines. If PRMs do not exist, then lot corners or PCPs shall be used to establish the plat limits. If no corners or PCPs can be found, then plat limits can be established using record plat information.

Ties to section corners, quarter corners and other important corners shall be shown by station plus and bearing and distance to corner. Include the type of monumentation found or set.

Breaks in all existing right of way lines shall be clearly labeled shown by station and offset.

Existing right of way shall be accompanied by an O.R.B. and Page or Plat Book and Page.

Existing Easements and reservations shall be clearly labeled with station and offsets.

Proposed right of way lines shall be clearly labeled and tied by station and offset.

Side Streets – Centerline of right of way on all existing side intersecting streets shall be tied by station and angle or bearing.

Acquisition Parcels – Right-of-way parcel takes shall be clearly shown with all data necessary to describe the parcel. Bearings and distances must be shown for all parcel boundaries and property lines. Where boundaries are curved lines a minimum of Radius, Delta Angle, and Arc length shall be shown. Non tangent curves must be identified and show delta angle, arc length, radius and chord bearing or radial bearing.

Parcel numbers will be identified in bold print in parcel bubbles. Show a Baseline and offset tie to beginning and end of each parcel. (Right-of-way parcel numbers start in the 100 series)

Right-of-way takes shall be clearly labeled with stations and offsets.

Permanent Easements shall be clearly labeled with station and offsets. (Numbers start in the 200 series)

Temporary Construction Easements shall be clearly labeled with station and offsets. (Numbers start in the 300 series)

Relocatable easements shall be clearly labeled with station and offsets. (Numbers start in the 400 series)

Curve or Tangent tabulation are not permitted. ~~without the above information is not permissible~~

Finished Floor Elevations are required on all adjacent properties unless instructed otherwise by Roadway Production.

Topographic features will be tied by Station and Offset (specific by project) and shall include, but not be limited to:

Buildings, improvements and key topographic features, e.g., groves, fences, signs, bodies of water, etc., within the proposed right of way. Buildings, canopies/overhangs, and signs, etc., severed by the acquisition will be dimensioned accordingly. Buildings within 25 feet of the proposed right-of-way will show a distance from the nearest corner of the building to the proposed right of way line. Buildings will be labeled to show use if apparent, e.g., residential, commercial.

LEGAL DESCRIPTIONS AND SKETCHES

LEGAL DESCRIPTIONS

Legal Descriptions will be submitted on letter size (8½" x 11") and have a minimum lettering height of 0.10".

Legal Descriptions should be as simple as possible. i.e. "The South 25 feet of Lot 4,"

Where applicable use qualified calls i.e. Plat lines, record R/W lines or sectional breakdown lines must be shown.

Legal Descriptions and Sketches must include **(3 Sets)**:

1. Legal Descriptions and Sketches must meet the applicable Palm Beach County Standards and will be signed (original signature) and sealed in accordance with the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in rule 5J-17.050-.052, Florida Administrative Code, pursuant to Chapter 472.027, Florida Statutes.
2. Section, Township and Range or Subdivision name and recording data, lot, block, parcel control number and recording information of owners deed.
3. POC or POB – Use Government or Record corner where a monument was recovered or set.
4. Curve boundaries must show a minimum of Delta, Radius and Arc Length.
5. Non tangent curves must be identified and show delta angle, arc length, radius and chord bearing or radial bearing.
6. The area should be shown in square feet if the take is less than one-half acre.

SKETCHES

A sketch prepared on letter sized (8½" x 11") will accompany all legal descriptions. The minimum lettering height shall be 0.10".

The sketch must be in exact accord with the legal description and the survey/right of way procurement map and contain the following information:

1. Project number and Parcel number, with intended use. (100 series Fee Simple R/W, 200 series Permanent Easements, 300 series Temporary Construction Easements, 400 series Relocatable Easements).
2. Bearing base will be Grid Bearings referenced to a well-established, monumented line shown on the sketch.
3. North arrow and scale.
4. POC and POB labeled and tied to a pair of recovered PRM's, Geodetic Control Points or Government Corners.
5. Bearings and distances on all courses.
6. Baseline tie to beginning and end of each parcel.

7. Abbreviations not generally used by the Public must be shown in a legend.
8. Record information of adjacent roads or canals.
9. Stations and offsets to all corners are from construction center line and are required to define the right-of-way and easements. A reference to the plans by project name, number, and date must be shown.
10. The Parcel must be tied to a pair of well-established and monumented Geodetic Control Points or a pair of monumented or positioned Government Corners.
11. State Plane Coordinates must be provided at the POB and one additional corner on the sketch in accordance with County Wide PPM # CW-O-058.
12. All legal descriptions and sketches must stand alone and not rely on the survey or plans for legal sufficiency.

**Supplement to Palm Beach County
Thoroughfare Road Design Procedures**

Palm Beach County Bridge Design Guidelines

General Information

- a. Bridges shall be designed in accordance with current AASHTO (American Association of State and Highway Transportation Officials) and Florida Department of Transportation Specifications and shall include planning for utility installation.
- b. All bridge structures shall be designed for HL-93 AASHTO LRFD loading, unless otherwise directed by the Roadway Production Division.
- c. All bridges over water shall be designed for scour as per current FDOT Structures Manual, Volume 1 Structures Design Guidelines.

Preliminary Design Phase

Typical Bridge Section

The Bridge Typical Section must be reviewed and approved by Palm Beach County prior to the project design. This must be submitted after the approval of the roadway typical section. The Typical Section must include the design speed and the beginning and end bridge stations.

Structure Type, Size and Location (TS&L)

Based on the complexity of the specific bridge project; the County *may* request that a type, size and location (TS&L) study be conducted. This type of study is done to establish the most suitable structure for a given location. The specific study parameters shall be established between the Engineer and the County when required. These studies shall be conducted once the bridge typical section is approved and prior to completion of the Preliminary Design Phase.

Water Management Agencies

The particular water management agencies and drainage districts must be contacted early in the design phase to determine the required span length of the proposed structure. When possible a canal section or a letter approving preliminary design spans should be provided. In certain conditions, when a drainage district does not control the water crossing, a hydraulic report must be used to determine span lengths. This analysis should be submitted to this office prior to design phase.

Documentation should be obtained from the respective drainage districts including; minimum horizontal opening; minimum vertical clearance above normal design stages, as well as, anticipated flow rates and corresponding stages. This information will be necessary in establishing Hydraulic impacts on the proposed structure. In the event that a detailed Bridge Hydraulics Report is required, the Engineer shall follow current *FDOT Drainage Manual Guidelines*, as well as, any requirements placed by the Water Management Agencies. If required by the County, Bridge Hydraulic Recommendation Sheet shall be provided with bridges over water as per current FDOT Structures Manual Volume 1 – Structures Design Guidelines. Bank and Shore riprap shall be used across the full width of canals at bridge sites.

Widening Existing Bridge Structures

Any proposed widening of an existing structure shall be based on the current *FDOT Structures*

Manual, Volume 1 Structures Design Guidelines.

This information should be submitted to the County for approval prior to the design phase.

Rectangular beams with voids such as Hollowcore and Sonovoid bridges, shall not be widened except by special permission from the County.

Bridge Construction Plans

Title Sheet

For bridge plans that require a title sheet (i.e. no roadway design work), standard notes must be shown along with a location map calling out the section, township and range, Engineering certification, index of sheets, FDOT index numbers, benchmarks as well as other appropriate information. When a title sheet is not required, the general notes sheet in the plans shall include the index of sheets, the FDOT index numbers and any standard notes.

Maintenance of Traffic (If required)

If the Maintenance of Traffic is phased, it can be shown on the plan and elevation sheet with sections shown on substructure and superstructure sheets. If the Maintenance of Traffic is complex, a separate sheet should be provided showing a detailed description of the proposed maintenance of traffic.

General Notes

The general notes shall include the following items:

- A. General Specifications
- B. Design Specifications
- C. Vertical Datum
- D. Structural Analysis Program
- E. Design Loadings
 - 1. Dead Load
 - Reinforced Concrete Weight
 - Barrier Loads
 - Stay in Place Forms
 - Future Wearing Surface
 - Sacrificial Deck Thickness
 - 2. Live Load
 - LRFD Requirements
 - 3. Wind Load
 - Per AASHTO LFRD
 - 4. Thermal Forces
 - 5. Construction Loads
 - 6. Vehicle Collision Force
 - 7. Utilities Load
- F. Design Method
- G. Material Properties
 - 1. Concrete
 - 2. Reinforcing Steel
 - 3. Prestressing Strands
 - 4. Neoprene Bearing Pads
 - 5. Structural Steel
- H. Concrete Cover
- I. Foundations
- J. End Bents
- K. Superstructure
- L. Surface Finish
- M. Environment
- N. Bridge Deck Finish
- O. MSE Wall Notes (if applicable)
- P. Temporary Critical Wall Notes (if applicable)
- Q. Bridge Name and Number
- R. Screeding Deck
- S. Stay in Place Forms
- T. Joints in Concrete
- U. Existing Bridge Considerations
- V. Traffic Control/Bridge Phasing

Plan and Elevation Sheet

A Plan and Elevation Sheet must be included in the construction plans. The plan and elevation sheet must show the roadway dimensions, all roadway and canal right-of-way lines, high water elevation, control water elevation, clearance, span dimensions, canal cross-sections both existing and proposed with bottom of canal elevations, low member elevation, type of structure, slope protection with all dimensions, utility information both existing and proposed, guardrail attachment either FDOT index number or referenced to appropriate roadway sheet, drainage pipe locations, structure number and other pertinent design information. Also, to be included is the baseline and centerline of construction with bearing and the centerline of canal with bearing, beginning and end stations for the approach slabs, begin bridge and intermediate bents as required. The vertical alignment of grade is needed. Detail and dimensions of the required slope protection should be provided. This information should be received by the governing water management agency but if none is in jurisdiction, the hydraulic flow calculations shall determine the necessary slope protection based on scour potential and flow velocities.

Pile Layout Sheet

A Pile Layout Sheet is required on all thoroughfare roadway bridge projects. Piles shall be of a low maintenance material, preferably prestressed concrete. If prestressed concrete piling is used they must conform to standard FDOT piling. Obtain written approval for other foundation types from County's Road and Bridge Division.

The following items should be addressed on the sheet and include a pile data table per the current *FDOT Structures Manual, Volume 1 – Structures Design Guidelines*:

1. Pile cut off elevations.
2. Pile location from the centerline of construction.
3. Pile sizes.
4. Minimum bearing capacities GRLWEAP analysis.
5. Recommended test pile locations per FDOT guidelines for design spans.
6. Finish grade elevations.
7. The minimum pile tip elevation to satisfy lateral load requirements.
8. Location of existing and proposed utilities to existing and proposed piles.
9. Scour implications and required counter measures.
10. Construction phasing (if applicable).
11. Pile down drag.
12. Vibrations concerns and measures for dealing with vibration (if applicable).

Substructure Sheets

Pile Cap Design

The Substructure Design Sheets shall include:

End Bent Sheet.
Intermediate Bent Sheet/Pier Sheet.
End Bent Details.

The End Bent Sheet shall show the plan, elevation and section views with all the bent dimensions adequately called out. All reinforcing steel shall be clearly marked. The required pile embedment of one (1) foot and sheet pile embedment of six (6) inches minimum, where applicable, shall be shown. Any variation from this will require detailed design calculations. The end bent details shall include the connection between the superstructure and approach slab to the substructure.

The Intermediate Bent should be similar to the end bent sheet requirements.

The Sheet Pile and Slope Protection Section should be referenced from the End Bent Sheet. Sheet piling shall be of a low maintenance material such as concrete. Continuous sheet piling is required beneath abutments and wing walls. The bottom of the sheet piling shall not be higher than the bottom of the proposed canal elevation. Due to local construction practices, the preferred concrete sheet piling shall span between the piling and interlock with an approved grout sock. Sheet Pile wall design shall be in accordance with current *FDOT Structures Manual, Volume 1 – Structures Design Guidelines*.

Please be advised that Design represents minimum requirements. The Engineer is responsible for determining adequate embankment protection based on hydraulic flow and water management agency's recommendation.

Superstructure Sheets

Detailed Superstructure Sheets are required which include all pertinent design information. Prestressed stranding for prestressed units must be designed by an Engineer, not the manufacturer. The superstructure material must be concrete. In certain cases, composite designed prestressed/precast concrete can be used. Composite steel design should only be considered when extremely long design spans or curved sections are required. Below is a description of what will be required for the most common types of superstructures. The Design Engineer shall obtain County Engineering Department's Road & Bridge Division approval for use of any other materials.

Deck Design

Pre-Stressed Concrete Slab Units

For Prestressed Concrete Slab Units, the design must follow current *FDOT Structures Manual, Volume 1 – Structures Design Guidelines*. The sheets must include: slab unit layout, post-tensioning sequencing, slab unit plan, elevation and section views showing all pre-stressing strands, ducts and reinforcing steel. All information regarding special details, block out sizes, and bursting grids are required. Anchorage assemblies can be shown by shop drawings, but, the dimensions of the plates and the number of post-tensioning ducts must be referenced in the construction plans. Material specifications and construction notes shall be placed on these sheets. Any other pertinent data, such as bearing pads, must be clearly marked.

Cast-in-Place Concrete

For Cast-in-Place Concrete Decks, the Superstructure Sheets must include: slab dimensions, reinforcing steel locations and call outs. A typical section is required showing top, bottom, longitudinal and transverse steel. Connection to barrier wall, sidewalk, and traffic separators must be clearly detailed. Request shop-drawings for a Concrete Placement Plan. This is to control location of splices and construction joints.

Girder/Beams

For larger structures, generally spans greater than forty (40) feet, Prestressed concrete I-Girder beams with a minimum eight and one half (8 1/2) inch reinforced concrete deck slab shall be used. *FDOT Structures Manual, Volume 1 – Structures Design Guidelines* shall be used.

Composite Steel Girders

The design and details of composite steel girder systems shall be in accordance with current FDOT structures Manual, Standard Plans, and Design Manual.

Details

The Superstructure Details shall include: shear key design, sidewalk and traffic separator design and connection, and closure beams.

Approach Slab

The Approach Slab Sheet shall be per FDOT current version of Standard Plans. Standard Drawings designed by the Engineer. If the approach slab is designed, the sheets must include: all dimensions, type and locations of reinforcing steel, typical cross-sections and thickness (variation in slab thickness must be clearly shown). The minimum slab thickness is nine (9) inches for approach slab widening and for new approach slabs.

Retaining Walls

The design of conventional and propriety retaining wall systems shall utilize the design requirements of the current FDOT structures Manual, Standard Plans, and Design Manual. Geotechnical recommendations are to be documented in the design files. The construction plans are to be reviewed by the project Geotechnical Engineer of Record for conformance with Soil Property and Geotechnical recommendations.

Reinforcing Bar Schedules

Reinforcing Bar Schedules are required on all thoroughfare roadway bridge projects. The tables shall include: bar designation number, type of bar, size of bar, number of bars, lap splice length and embedment lengths. Lap splices and embedment lengths shall be dimensioned in the detailed drawings. Lap splice tables may be provided in the plans at the option of the Design Engineer.

Bridge Computations and Related Material

Structural Calculations

At each phase submittal, appropriate support computations and documents shall be provided. Two sets of Design Calculations must be submitted at the 96% design review. The computations must be in a neat and concise order with proper heading and references to appropriate codes and design standards. Page numbers are required for every submittal. AASHTO LRFD design criteria is required on all thoroughfare bridges. The following is a partial list of what calculations are required for submittal.

1. Pile design loads.
2. Bent and intermediate bent design.
3. Superstructure design including all prestressed items, form work design, etc.
4. Approach slab design if FDOT Standard drawing is not used.
5. Miscellaneous details.
6. Minimum pile lengths for lateral pile stability.

Cost Estimates

A Bridge Cost Estimate is required at the 96% design submittal.

Permits

Permits are required from the various environmental and state agencies. Please see Thoroughfare Roadway Standards.

Specifications

Any special specifications not included in the *FDOT Specifications for Road and Bridge Construction* are required.

Quantities

A Bridge Quantity Sheet is required in the bridge construction plans. All quantities should make reference to FDOT Standard Plans. A computation booklet should be included in the design computation submittal.

Utility Coordination

The Design Engineer shall follow the *Palm Beach County Utility Guidelines for Connection to Bridge Structures*. The utilities should be coordinated, at the beginning of the design phase, with County officials. It is the responsibility of the Engineer to coordinate with the utilities in road and bridge construction. The County will hold formal meetings under the direction of the utility coordinator. The various utility companies may request the services of the Design Engineer to place their facilities on the bridge structure.

Construction (If Required)

The Design Engineer is responsible for the review and approval of all shop drawings required for the project. The pile data shall be reviewed and pile lengths determined in a timely manner. Coordination between the Design Engineer and the Palm Beach County Construction Coordination is essential during construction.

**Palm Beach County
Bridge Design Procedures**

Reference Material Latest Edition

AASHTO LRFD Bridge Design Specifications
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001

Current FDOT Structures Manual

Current FDOT Standard Plans

Current FDOT Design Manual

FDOT Roadway and Traffic Design Standards

Palm Beach County Thoroughfare Road Design Procedures

PCI Design Handbook-Precast and Prestressed Concrete
175 W. Jackson Blvd
Chicago, IL 60604

Bridge Design Submittal Requirement

Bridge Typical Section

PHASE IA – 35% DESIGN REVIEW

1. Approved Typical Section.
2. General Notes Sheet completed.
3. Preliminary Plan and Elevation Sheet showing design spans and canal cross sections.
4. Preliminary Pile Layout Sheet showing pile spacing and size.
5. Preliminary Bent Sheet showing bent dimensions and pile locations.
6. Preliminary Deck Layout Sheet.
7. Appropriate FDOT Standards Sheets.
8. Design Calculations.

PHASE IIA – 65% DESIGN REVIEW

1. All comments from the 35% review must be addressed.
2. Basic Structural design of all sheets complete.
3. Design Calculations.

PHASE IIB – UTILITY COORDINATION MEETING

PHASE III – 96% DESIGN REVIEW

1. All comments from the 65% review must be addressed.
2. Reinforcing Schedule complete.
3. Bridge Quantities complete.
4. All Structural Details should be complete.
5. All utilities addressed.
6. All permits applied for and status reported to County.
7. Cost Estimate.
8. Design Calculations.
9. As-built load rating for all Florida live loads.

PHASE IV – 100% Design Review

1. All Comments from the 96% review addressed.
2. Special Specifications.
3. All Permits in hand.

FINAL SUBMISSION

1. Final Roadway Plans received.
2. One set of signed and sealed plans (each Sheet).
3. Final Cost Estimate.

CONSTRUCTION PHASE (IF REQUIRED)

1. Pile Logs reviewed and production pile lengths determined.
2. Shop Drawings approval.
3. As-built load rating for all Florida live loads.

CADD SYSTEM DESIGN GUIDELINES

Consultants are required to adhere to all Palm Beach County's CADD standards. All CADD files are to be submitted with PHASE ID – (35% SUBMITTAL) which will be reviewed by the County and checked for CADD Conformance Standards.

The County will provide the following resources, and consultants are required to use appropriately:

- Palm Beach County Design CADD Standards (.dgnlib).
- Palm Beach County Custom Line Resource File (.rsc).
- Palm Beach County CADD Color Table (.tbl).
- Palm Beach County CADD Seed File.

SURVEY AND DESIGN STANDARDS

LEVEL NAME	TEXT SIZE								CO L O R	LINE STYLE	LINE WT.
	SCALE: 1" =										
	10	20	40	50	100	200	400	500			
Aerial Targets									107	0	0
Aerial Targets Texts	.8	1.6	3.2	4	8	16	32	40	107	0	0
Airport Runway									51	0	1
Airport Runway Texts	.8	1.6	3.2	4	8	16	32	40	51	0	0
Baseline (Survey)									3	0	3
Baseline Bearing and Curve Data	.8	1.6	3.2	4	8	16	32	40	3	0	1
Baseline Station and Tick Mark	.8	1.6	3.2	4	8	16	32	40	3	0	1
Baseline Ties and References	.8	1.6	3.2	4	8	16	32	40	3	0	0
Boat Ramp									136	0	1
Boat Ramp Texts	.8	1.6	3.2	4	8	16	32	40	136	0	0
Bridge Structures (Existing)	.8	1.6	3.2	4	8	16	32	40	11	0	0
Bridge Structures (Proposed)									11	0	2
Bridge Structures Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	11	0	0
Bridge Structures Texts (Proposed)	1	2	4	5	10	20	40	50	11	0	0
Building (Existing)									110	0	0
Building (Proposed)									110	0	2
Building Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	110	0	0
Building Texts (Proposed)	1	2	4	5	10	20	40	50	110	0	0
Centerline (Construction)									4	centerline	1
Centerline Bearing and Curve Data	1	2	4	5	10	20	40	50	4	0	1
Centerline Station and Tick Mark	1.5	3	6	7.5	15	30	60	75	4	0	1
Centerline Ties and References	1	2	4	5	10	20	40	50	4	0	0
Codes (Survey)									0	0	0
Contours (Major)									55	0	1
Contours (Minor)									55	0	0
Contours Texts (Major)	1	2	4	5	10	20	40	50	55	0	1
Contours Texts (Minor)	.8	1.6	3.2	4	8	16	32	40	55	0	0
Control Points (Survey)									0	0	0
Control Points Texts	.8	1.6	3.2	4	8	16	32	40	0	0	0
Curb and Gutter (Existing)									119	Pavement, Curb and Gutter (existing)	0
Curb and Gutter (Proposed)									119	0	2
Curb and Gutter Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	119	0	0
Curb and Gutter Texts (Proposed)	1	2	4	5	10	20	40	50	119	0	0
Driveway (Existing)									5	0	0
Driveway (Proposed)									5	0	2
Driveway Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	5	0	0
Driveway Texts (Proposed)	1	2	4	5	10	20	40	50	5	0	0
Easement (Existing)									93	Easement	0
Easement (Proposed)									93	Easement	2
Easement Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	93	0	0
Easement Texts (Proposed)	1	2	4	5	10	20	40	50	93	0	0
Edge of Water (Existing)									87	0	0
Edge of Water (Proposed)									87	0	2
Edge of Water Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	87	0	0
Edge of Water Texts (Proposed)	1	2	4	5	10	20	40	50	87	0	0
Elevations (Existing)	.8	1.6	3.2	4	8	16	32	40	0	0	0
Elevations (Proposed)	1	2	4	5	10	20	40	50	0	0	1
Errors									0	0	0
Fence									0	Use appropriate fence line style	0
Fence Texts	.8	1.6	3.2	4	8	16	32	40	0	0	0
Fire Hydrant									135	0	0
Fire Hydrant Texts	.8	1.6	3.2	4	8	16	32	40	135	0	0
Force Main (Existing)									120	Force Main (existing)	0
Force Main (Proposed)									120	Force Main (proposed)	2
Force Main Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	120	0	0
Force Main Texts (Proposed)	1	2	4	5	10	20	40	50	120	0	0
Guardrail (Existing)									169	0	0
Guardrail (Proposed)									169	0	2
Guardrail Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	169	0	0

SURVEY AND DESIGN STANDARDS

LEVEL NAME	TEXT SIZE								CO L O R	LINE STYLE	LINE WT.
	SCALE: 1" =										
	10	20	40	50	100	200	400	500			
Guardrail Texts (Proposed)	1	2	4	5	10	20	40	50	169	0	0
Irrigation (Existing)									71	Irrigation (existing)	0
Irrigation (Proposed)									71	Irrigation (proposed)	2
Irrigation Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	71	0	0
Irrigation Texts (Proposed)	1	2	4	5	10	20	40	50	71	0	0
Lane Line									189	3	1
Levees									22	0	0
Levees Texts	.8	1.6	3.2	4	8	16	32	40	22	0	0
Lot Line									33	0	2
Lot Line Texts	.8	1.6	3.2	4	8	16	32	40	33	0	0
Mailbox									0	0	0
Mailbox Texts	.8	1.6	3.2	4	8	16	32	40	0	0	0
Mangrove (Existing)									146	0	0
Mangrove (Proposed)									146	0	2
Mangrove Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	146	0	0
Mangrove Texts (Proposed)	1	2	4	5	10	20	40	50	146	0	0
Manhole (Existing & Generic) field located									88	0	0
Manhole Texts (Existing & Generic) field located	.8	1.6	3.2	4	8	16	32	40	88	0	0
Match Line									0	0	2
Match Line Texts	1	2	4	5	10	20	40	50	0	0	1
Misc Structures (Existing)									0	0	0
Misc Structures (Proposed)									0	0	2
Misc Structures Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	0	0	0
Misc Structures Texts (Proposed)	1	2	4	5	10	20	40	50	0	0	0
Misc Texts	1	2	4	5	10	20	40	50	0	0	0
Municipal Boundary									165	Municipal Boundary	2
Municipal Boundary Texts	.8	1.6	3.2	4	8	16	32	40	165	0	0
North Arrow									0	0	1
Notes	.8	1.6	3.2	4	8	16	32	40	0	0	0
Pavement (Existing)									15	Pavement, Curb and Gutter (existing)	0
Pavement (Proposed)									15	0	2
Pavement Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	15	0	0
Pavement Texts (Proposed)	1	2	4	5	10	20	40	50	15	0	0
PGL (Existing)									102	2	0
PGL (Proposed)									102	0	2
PGL Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	102	0	0
PGL Texts (Proposed)	1	2	4	5	10	20	40	50	102	0	0
Point Names (Survey)	.8	1.6	3.2	4	8	16	32	40	0	0	0
Preliminary Stamp									179	0	0
Property Corners									0	0	0
Property Corners Texts	.8	1.6	3.2	4	8	16	32	40	0	0	0
Property Line (Boundary)									175	0	3
Property Line Texts (Boundary)	.8	1.6	3.2	4	8	16	32	40	175	0	0
Railroad (Existing)									131	0	0
Railroad (Proposed)									131	0	2
Railroad Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	131	0	0
Railroad Texts (Proposed)	1	2	4	5	10	20	40	50	131	0	0
Raster Image									0	0	0
Right-of-Way (Existing)									10	Right-of-Way	0
Right-of-Way (Proposed)									10	Right-of-Way	3
Right-of-Way Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	10	0	0
Right-of-Way Texts (Proposed)	1	2	4	5	10	20	40	50	10	0	0
Sanitary Sewer Structures (Existing)									120	Sanitary Sewer (existing)	0
Sanitary Sewer Structures (Proposed)									120	Sanitary Sewer (proposed)	2
Sanitary Sewer Structures Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	120	0	0
Sanitary Sewer Structures Texts (Proposed)	1	2	4	5	10	20	40	50	120	0	0
Scale	1.5	3	6	7.5	15	30	60	75	0	0	1
Seawall									161	0	0
Seawall Texts	.8	1.6	3.2	4	8	16	32	40	161	0	0

SURVEY AND DESIGN STANDARDS

LEVEL NAME	TEXT SIZE								CO L O R	LINE STYLE	LINE WT.
	SCALE: 1" =										
	10	20	40	50	100	200	400	500			
Section Line									139	Section line	0
Section Line Texts	.8	1.6	3.2	4	8	16	32	40	139	0	0
Section Symbols									139	0	1
Sidewalk (Existing)									163	0	0
Sidewalk (Proposed)									163	0	2
Sidewalk Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	163	0	0
Sidewalk Texts (Proposed)	1	2	4	5	10	20	40	50	163	0	0
Sign									0	0	0
Sign Texts	.8	1.6	3.2	4	8	16	32	40	0	0	0
Speed Hump (Existing)									158	5	0
Speed Hump (Proposed)									158	0	2
Speed Hump Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	158	0	0
Speed Hump Texts (Proposed)	1	2	4	5	10	20	40	50	158	0	0
Storm Drain (Existing)									92	Storm Drain (existing)	0
Storm Drain (Proposed)									92	Storm Drain (proposed)	2
Storm Drain Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	92	0	0
Storm Drain Texts (Proposed)	1	2	4	5	10	20	40	50	92	0	0
Street Names	2	4	8	10	20	40	80	100	0	0	1
Striping									80	Use appropriate striping line style	3
Striping Texts	1	2	4	5	10	20	40	50	80	0	0
Tick Symbol (Survey)									0	0	0
Title Sheet Texts									0	0	1
Top of Bank_Toe (Existing)									100	0	0
Top of Bank_Toe (Proposed)									100	0	2
Top of Bank_Toe Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	100	0	0
Top of Bank_Toe Texts (Proposed)	1	2	4	5	10	20	40	50	100	0	0
Traffic Separator (Existing)									12	0	0
Traffic Separator (Proposed)									12	0	2
Traffic Separator Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	12	0	0
Traffic Separator Texts (Proposed)	1	2	4	5	10	20	40	50	12	0	0
Trees									130	0	0
Trees (Cogo Points)	.8	1.6	3.2	4	8	16	32	40	130	0	0
Trees Texts	.8	1.6	3.2	4	8	16	32	40	130	0	0
Utilities									140	Use appropriate utility line style	0
Utilities Texts	.8	1.6	3.2	4	8	16	32	40	140	0	0
Water Structures (Existing)									135	Water Line (existing)	0
Water Structures (Proposed)									135	Water Line (proposed)	2
Water Structures Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	135	0	0
Water Structures Texts (Proposed)	1	2	4	5	10	20	40	50	135	0	0
Wetland Boundary (Existing)									114	0	0
Wetland Boundary (Proposed)									114	0	2
Wetland Boundary Texts (Existing)	.8	1.6	3.2	4	8	16	32	40	114	0	0
Wetland Boundary Texts(Proposed)	1	2	4	5	10	20	40	50	114	0	0

PBC Engineering Design Custom Line Styles

Centerline	
Pavement, Curb & Gutter (Existing)	
Pavement, Curb & Gutter (Proposed)	
Easement	
Force Main (Existing)	
Force Main (Proposed)	
Irrigation (Existing)	
Irrigation (Proposed)	
Municipal Boundary	
PGL (Existing)	
PGL (Proposed)	
Right-Of-Way (Existing)	
Right-Of-Way (Proposed)	
Sanitary Sewer (Existing)	
Sanitary Sewer (Proposed)	
Section Line	
Storm Drain (Existing)	
Storm Drain (Proposed)	
Water Line (Existing)	
Water Line (Proposed)	

FENCE

UTILITY

e-bE (existing - buried Electric)	
e-oE (existing - overhead Electric)	
e-bFO (existing - buried Fiber Optic)	
e-oFO (existing - overhead Fiber Optic)	
e-bG (existing - buried Gas)	
e-bT (existing - buried Telephone)	
e-oT (existing - overhead Telephone)	
e-bTV (existing - buried TV)	
e-oTV (existing - overhead TV)	
e-bU (existing - buried Utility)	
e-oU (existing - overhead Utility)	

Signal Design Submittals

Traffic Signal Design will start when all right-of-way and lane geometrics are established. Accordingly the first signal design submittal will be at the 65% of roadway submittal. Traffic signal design submittal included in the 65% roadway submittal is also considered 65% signal submittal. The 65% signal design submittal will include:

- All utilities, including underground, overhead, and clearances, identified and shown on the signal plans.
- Verification of all utility calls.
- Right-of-way, complete road geometrics, and pavement markings shall be included on the same plan as part of the signal plan.
- Pole locations.
- Mast Arm lengths identified for mast arm signals.
- All signal head locations and alignment.
- All Illuminated Street Name Signs.
- Controller location.
- Loops locations, detection camera and zone locations, or radar location.
- Pull-box locations.
- Locations of signal power source and written documentation of agreement with Power Company for power source.
- Signal phasing.
- Turning movement counts.
- Pedestrian devices including heads, detectors and signs.
- Traffic Signal General Notes.
- Mast arm or concrete pole detail and layout sheet.

All comments on the 65% shall be addressed, plans resubmitted and approved before 96% plan submittal. Subsurface utility engineering (SUE) services to accurately locate utilities at each signal pole location may be requested at this stage of the design, as needed. SUE services for each signalized intersection in the project are to be included as an optional service in the design scope of work.

The 96% submittal will include:

- Structural analysis.
- Details sheets.
- Estimated quantities.

*All utilities identified and shown on signal plans at all submittals.

Supplemental References

Florida Department of Transportation Publications:

- Drainage Manual (*Latest Version*) FDOT #625-040-002.
- Traffic Engineering Manual (*Latest Version*) FDOT #750-000-005.
- Plans Preparation Manual Vol. 1 (*Latest Version*) FDOT #625-000-007.
- Plans Preparation Manual Vol. 2 (*Latest Version*) FDOT #625-000-008.
- Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (*a.k.a. Florida Greenbook*) (*Latest Version*) FDOT #625-000-015.
- Design Manual (*Latest Version*) FDOT #625-000-007.
- Design Standards (*Latest Version*) FDOT #625-010-003.
- Structures Design Guidelines for Load Resistance Factor Design (*Latest Edition*) FDOT #.
- Structures Design Office Standard Drawings(*Latest Edition*) FDOT #.
- Other FDOT Design Standards, as Applicable.
www.fdot.gov/procedures/formsandprocedures.shtm

FDOT Standard Specifications for Road and Bridge Construction (*version determined by PBC*)
<http://www.fdot.gov/programmanagement/Implemented/SpecBooks/default.shtm>

South Florida Water Management District Manual Volume IV (*Latest Version*)
http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/archive_erp_swerp_manual_aug_2016.pdf

Manual on Uniform Traffic Control Devices for Streets and Highways (*Latest Version*)
www.mutcd.fhwa.dot.gov

Palm Beach County

- Engineering and Public Works Roadway Production Typical Sections (*Latest Version*)
<http://discover.pbcgov.org/engineering/roadwayproduction/PDF/PalmBeachCountyTypicalSections.pdf>
- Access Management Standards for County Roads on the Thoroughfare Right of Way Identification Map (*Latest Edition*)
<http://discover.pbcgov.org/engineering/traffic/PDF/Traffic%20Documents/AMS.pdf>
- Traffic Signal Installation Standards and Details (*Latest Version*)
http://discover.pbcgov.org/engineering/traffic/PDF/Traffic%20Documents/signal_typicals.pdf
- Typicals for Pavement Markings Signing & Geometrics (*Latest Edition*)
http://discover.pbcgov.org/engineering/traffic/PDF/Traffic%20Documents/stripping_typicals.pdf
- Engineering and Public Works Land Development Design Standards Manual (*Latest Edition*)
<http://discover.pbcgov.org/engineering/LandDevelopment/Design-Standards.aspx>
- Other Palm Beach County Design Standards as applicable.

AASHTO

- A Policy on Geometric Design of Highways and Streets (*Latest Edition*) (*a.k.a. AASHTO Greenbook*)
- LRFD Bridge Design Specifications (*Latest Edition*)
- Other AASHTO Design Standards as Applicable
<https://bookstore.transportation.org/home.aspx>