PREFACE

The purpose of this document is to provide uniform minimum standards and criteria for the design, construction and maintenance of all public roads and streets, medians, curbs, gutters, drainage structures and networks, driveways, sidewalks and curb ramps, traffic controls, and commercial, industrial and residential developments constructed in Hernando County, Florida.

The standards established by this document are intended for use on all new construction projects. It is understood that the Standards herein cannot be applied completely to all reconstruction and maintenance type projects, however, the Standards should be applied to the extent that the economic and environmental considerations and existing development will allow, as determined by the County Engineer.

This document refers to the Florida Department of Transportation (FDOT) design standards, specifications, and guidelines; American Association of State Highway and Transportation Officials (AASHTO) publications; Federal Highway Administration (FHWA) books and documents; and Institute of Transportation Engineers (ITE) reports and publications; these guidelines and standards should generally be considered as minimum criteria.

The criteria and standards set forth in other manuals, which have been included by reference, shall be considered as requirements within the authority of the document.

Failure to follow these standards may result in a stop work order and/or other enforcement actions.

SELECTED BIBLIOGRAPHY

A Policy on Geometric Design of Rural Highways: (AASHTO Greenbook): American Association of State Highway and Transportation Officials (AASHTO), 5th Edition or latest.

Transportation and Traffic Engineering Handbook: (ITE Handbook): Institute of Transportation Engineers (ITE).

Manual on Uniform Traffic Control Devices for Streets and Highways: (MUTCD): U.S. Department of Transportation, Federal Highway Administration (FHWA), 2003 Edition, or latest.

Standard Specifications for Road and Bridge Construction: (FDOT Spec Book): Florida Department of Transportation (FDOT), 2007 Edition, or newer.

Design Standards: (FDOT Index): Florida Department of Transportation (FDOT), 2008 Edition, or latest.

Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways: (FDOT Greenbook): Florida Department of Transportation (FDOT), 2007 Edition, or latest.

Transit Facility Guidelines: Florida Department of Transportation (FDOT), 2005 Edition, or latest. http://www.dot.state.fl.us/transit/pages/transit facilities guidelines.pdf

Drainage Manual: Florida Department of Transportation (FDOT), 2006 Edition, or latest.

Storm Drains, Drainage Manual: Florida Department of Transportation (FDOT), 2004 Edition, or latest.

Trip Generation: Institute of Transportation Engineers (ITE), 7th Edition.

Florida Roundabout Guide: Florida Department of Transportation (FDOT).

Minimum Specifications for Traffic Control Signal Devices: Florida Department of Transportation (FDOT), 2000 Edition, or latest.

Guidelines for Landscaping Roadways: Hernando County Florida.

Guide for the Development of Bicycle Facilities: American Association of State Highway and Transportation Officials (AASHTO), 4th Edition or latest.

Hernando County Ordinance No. 2006-10, NPDES Ordinance

HERNANDO COUNTY FACILITY DESIGN GUIDELINES

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ENGINEERING DESIGN CRITERIA

SECTION I

DEFINITIONS

ARTERIAL STREETS AND HIGHWAYS: Primarily facilitate the through movement, i.e., mobility, of vehicular traffic. Access management techniques are commonly instituted on them to preserve the facilities' capacity. Land access is a secondary priority to the movement of traffic.

BICYCLE FACILITY: A designated travel way for bicycles, including bike lanes, bike paths, paved shoulders, wide lanes, and multi-use trails.

BMP- BEST MANAGEMENT PRACTICE: Implementation of industry standard control practices.

COLLECTOR STREETS: Function primarily to carry traffic from local streets to arterials. The operating speeds are generally lower than that of arterials, but generally greater than that of local streets. Collector roads provide a greater degree of land use.

COMPENSATORY EXCAVATION: The excavation within or directly contiguous to a flood plain for restoring flood storage capacity lost to fill within the flood plain. Compensatory excavation shall become part of the flood plain and based on the professional justification by the engineer of record that the excavated area is adequately connected hydraulically to the historic flood plain area.

CONSTRUCTION ENTRANCES AND TRUCK ROUTES: Approved routes to/from the site to all major roads. All construction vehicles going to from the site will utilize these routes.

CUL-DE-SAC: A widened end of a local road (typically circular in shape) to enable turnaround movements. The distance from the edge of the nearest connecting roadway to the center point of the cul-de-sac shall not exceed six hundred (600) feet. (To exceed 600' a variance is also required from the Fire Department and the cul-de-sac shall be designed to meet current National Fire Protection Association standards.)

DETENTION: The temporary storage of storm water runoff to limit the rate of discharge into receiving water bodies.

DEVELOPER: The owner, his agent, or employee engaged in the process of development.

DEVELOPMENT: Any man-made material change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

EASEMENT: A legally defined right of passage or use across a specified property. An easement may allow for access, placement of utilities, drainage, other purposes, or any combination of these uses.

ELEVATION: The vertical distance of a point above the established North American Vertical Datum (NAVD) 1988 expressed in feet above Mean Sea Level (MSL).

FILE OF RECORD: A permanent file which contains all pertinent data, correspondence, calculations, drawings, plats, etc. used to review site plans and/or plats of submitted developments.

FLOODPLAIN: The lateral extent of inundation by an event of given statistical frequency, such as "25-year flood plain," as designated by the Southwest Florida Water Management District (SWFWMD).

FLOODWAY: The channel of a watercourse and the adjacent land areas that must be reserved in order to discharge the 25-year flood or 100-year flood (base flood), as stipulated without cumulatively increasing the water surface elevation more than one-tenth of a foot.

FRONTAGE ROADS: Streets which run concurrent with arterial streets and highways, and which provide access to abutting properties and protection from through traffic. A frontage road may be developed along the property frontage or to the rear of the property (reverse frontage road).

FUGITIVE SOILS: Soils that have tracked, eroded, blown etc from where they were placed.

IMPERVIOUS: Surface which has been compacted or covered with a layer of material so that it is highly resistant to infiltration by water, including surfaces such as compacted sand, limerock, shell or clay, as well as most conventionally surfaced streets, roofs, sidewalks, parking lots and other similar structures.

KARST: An area of irregular limestone in which erosion has produced fissures, sinkholes, underground streams, and caverns.

MAJOR COLLECTOR ROAD: Designed to carry traffic from local streets to Arterial roadways; designed for moderate to high traffic volumes, moderate to high trip lengths and moderate to high speeds.

MAJOR DRAINAGE SYSTEM: A system of natural or man-made drainage-ways such as streams, ditches, or canals that collect stormwater runoff from watersheds identified in Hernando County.

MAJOR LOCAL ROAD: An intermediate road which carries more traffic than a local road but less than a Collector road. Designed as a main thoroughfare in a residential subdivision to carry traffic to and from local roads to Collector & Arterial roads.

MULTI-USE TRAIL: A designated travel way for combined pedestrian, bicycle and/or other non-motorized travel built to standards for multi-use trails design and construction, 10' standard width, 12' width for high volume and multiple modes.

NATURAL DRAINAGE-WAYS: Those watercourses that are either natural or have not been substantially excavated, graded or otherwise altered or improved, by man.

NPDES: National Pollutant Discharge Elimination System.

RECEIVING WATER BODIES: Those bodies and drainage-ways, either natural or man-made, that lie downstream of the site in question and which are susceptible to degradation of water quality due to activity at the upstream site.

REGISTERED ENGINEER OR LAND SURVEYOR: As defined by Ch. 471 and 472, Florida Statutes.

RETENTION: The prevention of direct discharge of storm runoff into receiving waters, included as examples are systems which discharge through percolation, exfiltration, and evaporation processes and which generally have residence times less than 3 days.

RIGHT-OF-WAY (ROW): A strip of land used or intended to be used for vehicular or pedestrian travel, whether public or private.

SEASONAL HIGH GROUNDWATER TABLE LEVEL (SHGWT): The elevation to which the ground or surface water can be expected to rise due to a normal wet season.

SIDEWALK: A designated pedestrian travel way built to standards for sidewalk design and construction.

MAINTENANCE

Prior to County acceptance, the Developer shall maintain all right-of-way, drainage retention areas, and drainage right-of-ways for a period of 18 months. During this period, grass shall be kept mowed to a height not to exceed ten inches. Should pavement cracks develop, the Developer shall be required to remediate the entire road lengths and/or sections with an approved sealer, i.e., Type I, II, III, slurry seal, fog seal.

The Developer shall periodically inspect for erosion problems after major storms and correct any erosion over 4" in depth. Prompt attention should be made when erosion has occurred within three feet of the edge of pavement. The Developer shall take corrective measures to stabilize and prevent further erosion within seven days. After this time has passed, the deficient area shall be brought to the attention of the Public Works Director for corrective action.

Periodic inspections will be performed by the County to determine if 80% of the amount of grassing and/or sodding originally planted has survived. These inspections will be conducted at six months, one year and eighteen months. The Developer shall remediate areas as identified as deficient.

ROADWAY CONSTRUCTION STANDARDS:

The following table summarizes Hernando County's minimum design and construction standards:

ROADWAY CLASSIFICATION	TRAFFIC SAFETY		RIGHT OF WAY				NEW ROAD CONSTRUCTION				PEAK HOUR TRAFFIC
ROADWAY DESCRIPTION	DESIGN SPEED	TRAFFIC STRIPING	MINIMUM (FEET)				LANE WIDTHS	MINIMUM THICKNESS (INCHES) (NOTES 1 & 3)			2 WAY TRIPS DURING PEAK HOUR (NOTE 1)
			OPEN DRAINAGE		CLOSED DRAINAGE						
	(MPH)		4 LANE	2 LANE	4 LANE	2 LANE	(FEET)	SUBBASE	BASE	SURFACE COURSE	
MAJOR COLLECTOR	60	YES	160	100	150	N/A	12 (NOTE 2)	12	8	3	N/A
COLLECTOR ROAD	40	YES	130	80	100	70	12 (NOTE 2)	12	8	2.5	151-450
MAJOR LOCAL/COMMERCIAL RD	35	YES	120	70	90	60	11	12	8	2	76-150
LOCAL ROAD	30	NO	N/A	60	N/A	50	10	9	6	1.75	0-75
FRONTAGE ROAD	30	YES	50	50	N/A	50	12	12	8	2	N/A
CLASS B SUB DIVISION > 10 LOTS	30	NO	N/A	60/30	N/A	N/A	9		4	1 (OPT)	N/A
CLASS C SUB DIVISION ≤10 LOTS	30	NO	N/A	60/30	N/A	N/A	12 (ONE LANE ONLY)		4	1 (OPT)	N/A

NOTES: N/A = Not Applicable

1. Truck traffic may reduce the traffic thresholds
2. Paved shoulders required on open drainage roadways.
3. Layer thickness other than those specified, shall have an equivalent structural number, and shall be subject to approval by the County Engineer.

ROADWAY REQUIREMENTS:

A. Minimum right-of-way requirements shall be as follow:

1. See typical Sheet I-04 and Sections IV-03 thru IV-15.
2. Cul-de-sacs shall have 50 feet of right-of-way approach to a minimum 120-foot diameter right-of-way for a turn around circle when constructed with curb and gutter, with a 50 foot paved radius.
3. Cul-de-sacs shall have 60 feet of right-of-way approach to a 140-foot diameter right-of-way for a turn around circle when constructed with open drainage, with a 50 foot paved radius.

B. Subdivision Streets:

1. Subdivision streets shall be planned so that residential lots will not have driveways entering directly onto Collector or Arterial streets.
2. Subdivision streets shall be classed as "Local Streets, Major Local Streets, or Collector Streets."

3. Subdivisions having ¼ acre lots or smaller, shall utilize curb and gutter, closed drainage, sod common areas and traversable inlets only.

4. Subdivisions having lots larger than ¼ acre shall include (1) a four-foot sod strip along all pavement edges when open drainage roadway system is utilized and (2) sod on all common areas.

C. Collector and Arterial streets shall have a minimum design speed as indicated in the Florida Department of Transportation Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways and as outlined in the roadway section of this guideline.

D. Roadway radii shall be a minimum of 30 feet at all intersection on Local Streets and Major Local Streets in residential areas.

E. Roadway radii shall be a minimum of 35 feet at all intersections on Collector Streets, Major Collector Streets, and Frontage Roads in Commercial areas.

F. The angle of the centerlines of intersecting roadways shall not be less than 70°.

G. Minimum distance between intersections on Local Streets shall be 150'. Intersections shall also meet all sight distance requirements.

H. Intersections: Roadway slopes at intersections shall not exceed 5% without a vertical curve.

ROADWAY DESIGN

Design Standards:

A. The Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Greenbook – Latest Edition) and Roadway and Traffic Design Standards (Latest Edition), each prepared by the Florida Department of Transportation, and the Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Latest Edition) are by reference incorporated into this document except where modified by this document. In case of conflict, the following standards shall apply.

B. General Paving Criteria:

1) Pavement cross-slope shall be ¼ inch per foot and inverted crowns are not permitted. Finish pavement shall be ¼ inch higher than the lip of any concrete gutter.

2) The minimum edge of pavement elevation for Local Street construction shall be at or above the 25-year storm events; Collector Street construction shall be above the 50-year storm event; and Major Collector Street construction shall be above the 100-year storm event, unless otherwise approved by the County Engineer.

C. Flexible Pavement Standards:

1) Sub-bases shall be of good, clean, acceptable material with a Limerock Bearing Ratio (LBR) of no less than 40, compacted to 98% of the maximum density determined by AASHTO T-180. The sub-base must extend six (6) inches beyond the back-of-curb or, for rural road sections, eighteen (18) inches beyond the base. If utility cuts are made after sub-base stabilization, the trenches shall be backfilled, full depth, with base material compacted to 98% maximum density. Sub-base material shall be separated a minimum of two (2) feet from high ground water conditions.

2) Bases may be constructed of limerock, crushed concrete, dura-rock, soil cement, or asphaltic concrete. Other materials may be proposed by the Developer for approval by the County Engineer, subject to the following standards:

3) Base material shall have a Limerock Bearing Ratio (LBR) of not less than 100.

4) Soil cement mixtures shall be designed by an Engineering Testing Laboratory and approved by the County Engineer. The Testing Laboratory shall monitor mixing and compaction.

5) Asphaltic concrete design mix shall be submitted for approval by the County Engineer.

6) Asphaltic concrete surface courses shall be mixed, placed, and compacted in accordance with Florida Department of Transportation Specifications for Hot Bituminous Material, Plant Methods, and Equipment & Construction Methods.

D. The pavement section elements specified herein are minimums. In some areas, due to soil conditions and/or traffic density, it may be required that the pavement structural section be designed in accordance with the Florida D.O.T. Flexible Pavement Design Manual.

E. The widening of an existing roadway may require milling and/or an overlay for the limits of said widening.

F. Approval for deviations from adopted pavement section elements shall be obtained in writing from the County Engineer.

G. Rigid (Portland Cement Concrete) pavement designs will be reviewed for approval by the County Engineer on a case-by-case basis.

H. Sidewalk Construction:

1) Sidewalks shall be constructed of 3,000 p.s.i. concrete at least five (5) feet wide and four (4) inches thick. Driveway sidewalks shall be six (6) inches thick with six (6) inch by six (6) inch #10 wire mesh reinforcing or with fibermesh in lieu of wire mesh reinforcing

2) Construction joints shall be provided every five (5) feet on center and ½ inch expansion joints every fifty (50) feet on center along entire length.

3) Sub-bases for sidewalks shall be of good, clean, acceptable material compacted to 95% of maximum density as determined by AASHTO T-180.

4) Sidewalks should be located in right-of-way within two (2) feet to two and one-half (2.5) feet of the property line on local and major local two lane roadways. Sidewalks should be located in right-of-way within one (1) foot of the property line on all other roadways.

5) Sidewalks shall be connected to each adjacent street per ADA and FDOT standards. Developers are required to install sidewalks in all common areas, including ADA street connections, parks, etc. Follow FDOT Index 304, 310 and FDOT Spec 527. For the detectable warning surface (truncated domes) only the Armorcast Detectable Warning Tile (red or yellow) S527-0012 in or equivalent from the FDOT Qualified Products List shall be acceptable. A tapered edge tile shall be used on all approach sides. All curbs that will get a sidewalk connection in the future will be recessed to accept a handicap ramp in the future.

I. All backfill over any pipe (storm sewer, water line, sanitary sewer) that is to be installed under roadways, must comply with sheet IV-16, Pavement Restoration, using flowable fill. Anything outside of one foot from the pavement, within the shoulder area, etc. of the roadway is to be compacted per Department of Transportation Specifications, Section 125.8.3, Latest Edition. This particular section specifies compaction to 100% of maximum density as determined by AASHTO T-99. This must be indicated on the plans.

J. Mailboxes shall be installed in conformance with the Florida Department of Transportation Roadway and Traffic Design Standards Index 532 (Latest Edition) and as required by the U.S. Postal Service.

DRAINAGE REQUIREMENTS

Scope:

A. All proposals for development shall include a detailed stormwater management plan to be submitted for approval by Hernando County.

B. Requirements:

1) Stormwater Runoff Storage/Discharge:

a) The retention/detention of cumulative stormwater runoff in excess of pre-development release rates and pre-development runoff volume shall be provided by sufficient storage capacity constructed on the property to be developed or within off-site drainage areas. Detention/retention storage capacity shall be based on a 25-year/24-hour duration storm event for open basins and 100-year/24-hour for closed basins and the requirements listed below. The 100-year pre/post volumes may be provided by a combination of storage volume and/or percolation as demonstrated by a routing and mounding analysis. Design high water elevations shall be established in consideration of adjacent properties and facilities such that off-site drainage impacts are minimized.

b) Special closed drainage basins, which have undersized receiving Drainage Retention Areas that flood during a 100-year 24-hour storm event, will necessitate proposed development to provide additional on-site storage volume to accommodate the 100-year storm event. These basins are the Forest Oaks, Berkley Manor, Spring Hill Drive Basins, and the Stony Brook Area of Ridge Manor as shown on sheets III-19-22, and any other basin with documented flooding, identified by the County Engineer and approved by the BOCC.

c) The detention/retention facilities designed for the storage of stormwater to control runoff rates and runoff volumes shall:

(1) Be designed in accordance with requirements of Hernando County, Southwest Florida Water Management District, the Florida Department of Transportation, and/or other agencies with jurisdiction.

(2) Be identified as a drainage retention easement on the final plat of a subdivision, or duly recorded as such in other developments. Include an outlet structure in detention/retention facilities sized to release, as a maximum, the pre-development runoff rate and pre-development volume and designed to provide water quality treatment of the runoff from the contributing area, in accordance with applicable standards of the respective agencies (Hernando County, Southwest Florida Water Management District, Department of Environmental Regulation, the Florida Department of Transportation) having jurisdiction.

(3) Constructed with a DRA height to provide a minimum of six (6) inches of freeboard between the design high water elevation and the lowest provided berm elevation surrounding the detention/retention area.

(4) Discharge from overflow structures flow through an abutting drainage easement, minimum twenty (20) feet, or public right-of-way in order to convey stormwater runoff away from the detention area. Drainage easements will be acceptable if the entire conveyance system is built and has capacity to accept increased runoff volumes. Engineering calculations will be required to support the use of drainage easements.

(5) Include special engineering features such as skimmers designed to remove oils and other objectionable materials, in accordance with criteria established by the Southwest Florida Water Management District, and other applicable agencies having jurisdiction.

d) Off-site discharge and volume is limited to amounts, which will not cause adverse off-site impacts.

(1) For a project or portion of a project located within an open drainage basin, the allowable discharge shall not exceed historic discharge and volume (25 year-24 hour storm), which is the peak rate and maximum volume at which runoff leaves a parcel of land under existing site conditions. These criteria shall not apply to projects, which have been discharging stormwater runoff directly to the Gulf of Mexico or a river system.

(2) For a project or portion of a project located within a closed drainage basin, the required retention volume shall be the post-development runoff volume, less the pre-development runoff volume, computed using Southwest Florida Water Management District's 24-hour/100-year rainfall map, and the Soil Conservation Services, Type II, Florida Modified 24-hour rainfall distribution with an antecedent moisture Condition II. The total post-development stormwater runoff volume leaving the site shall be no more than the total pre-development stormwater runoff volume leaving the site for the design 100-year storm, unless otherwise approved by the County Engineer.

e) Maintenance of pre-development off-site low flow may be required in hydrologically sensitive areas.

f) In Closed Basins, no net encroachment into the flood plain, up to that encompassed by the 100-year event, which will adversely affect conveyance, storage, water quality, or adjacent lands will be allowed. A detailed flood study performed by a registered engineer will be required by Hernando County, which indicates no adverse impact is caused. Any required compensating storage shall be equivalently provided between the seasonal high water level and the 100-year flood level to allow storage function during all lesser flood events.

g) Off-site Lands, adequate provisions shall be made to allow drainage from off-site upstream areas to downstream areas without adversely affecting the upstream or downstream areas.

h) Exfiltration Systems Designed in conjunction with Detention/Retention Systems.

i) Double ring infiltrometer tests shall be performed at each detention/retention facility, unless otherwise approved in advance by the County Engineer. Said test shall be performed at the approximate elevation of infiltration, (i.e. within two feet of DRA bottom elevation). If the test is greater than two feet above the bottom of the DRA, an additional .25 safety factor per foot above the initial two-foot allowance shall be added to the base 2.0-safety factor.

(1) A safety factor of 2.0 or more shall be applied in the exfiltration design to allow for geological uncertainties by dividing the exfiltration rate by the safety factor.

(2) All development plans shall include a drainage chart, which includes both post-developed and pre-developed discharge rates and volumes; results of Double Ring Infiltration test and the elevation that the test was conducted at; and the Seasonal High Groundwater Elevation.

j) Development of multi-family tri-plex and quad-plex projects require Drainage Retention Areas on-site, sized to store ½" of runoff from the contributing runoff sub-basin area for treatment purposes in systems that utilize dry retention methodology. Wet detention areas require 1" of runoff as above. General: All new developments shall be required to provide a detention/retention system in order to detain/retain-increased runoff caused by the development. Where public or private lakes, ponds, borrow pits, or similar type water detention/retention areas are incorporated in a comprehensive drainage plan, drainage calculations shall demonstrate that the facilities have sufficient capacity for the design storm.

2) Hydraulics of curb and gutter construction:

3) The minimum grade for curb and gutter road construction shall be 0.4 percent.

a) Length of curb run from any high point to a drainage inlet shall not allow stormwater to flood the roadway more than four (4) feet from back of curb. Spread calculations per FDOT Drainage Manual, Chapter 3 are required and shall be submitted for review.

b) Hydraulics of underground drainage: Underground drainage through storm sewers, where employed, shall conform to good accepted engineering practice. Coefficients of friction suitable for the type of pipe or structure shall be applied. Minimum pipe diameters shall be fifteen (15) inches for side drains and eighteen (18) inches for cross drains for swale drainage. Eighteen (18) inch minimum pipe diameter for closed hydraulic design. Inverted siphons shall not be accepted.

4) Hydraulics of drainage structure: Drainage structures such as bridges, box culverts, headwalls, dams, weirs, bulkheads and other structures shall be designed hydraulically and structurally in accordance with good engineering practice. The effects on adjacent channels and structures shall be considered. Energy dissipaters or other means of reducing flow velocity shall minimize erosion.

5) Drainage Outfalls:

a) Positive and adequate outfalls are required for all proposed and/or existing drainage systems. Engineering calculations are required to demonstrate the entire route of the receiving drainage outflow system has capacity to accept the additional stormwater discharge for the project. Energy dissipaters shall be installed at all drainage outfalls with exit velocities greater than 3 fps, for a minimum 10-year 24-hour storm event, or unusual site conditions. Label all velocities on plans. The Developer shall provide the "As-Built" location, elevation, and description of each outfall.

b) Drainage wells and seepage basins are not acceptable as positive outfalls. Percolation is the only outfall method, for dry retention pond systems. Drainage Detention ponds shall include water quality recovery systems in accordance with SWFWMD rules. In some cases of severe hardship, the County Engineer may approve an alternative device with special site-specific restrictions and requirements.

6) Discharge Structures: Discharge structures designed to discharge shall be located to outflow into County right-of-ways. A Drainage Right-of-Way (DROW) of twenty (20) feet minimum shall be provided for access to any stormwater detention/retention facility from a dedicated road or street to the discharge structure. The Developer shall provide the "As-Built" location, elevation, and description of each outfall. Stormwater Runoff: Runoff and routing analysis shall be based on current hydrological design procedures. Computations shall include a tabulation of both pre-developed and post-developed inflow, discharge, storage capacity, minimum and maximum water elevations, and retention/detention time to peak. Post-developed discharge rate and volume shall not exceed pre-developed discharge rate and volume for 25-year/24 hour storm event. Alternative drainage designs are allowable if approved by SWFWMD and then upon written approval by the County Engineer.

7) Conveyance Facilities:

a) General stormwater conveyance facilities include swales, ditches, channels, culverts, storm sewers, inlets, and weirs. The collection of stormwater runoff should be by positive gravity means without the use of siphons, pumps, or similar devices, unless specific approval is obtained from the County Engineer. The Engineer of Record shall design all underground piping.

8) NPDES Requirements:

a) Prior to the commencement of construction the Developer/Owner shall obtain the necessary permit, from State of Florida Department of Environmental Protection (FDEP), required to comply with the National Pollutant Discharge Elimination System (NPDES) stormwater regulatory program and Hernando County's NPDES Ordnance.

(1) Large Construction Activity is defined in 40 CFR Part 122.26(b)(14)(x)

(2) Small Construction Activity is defined in 40 CFR Part 122.26(b)(15)

b) Hernando County requires that all construction activity include the implementation of stormwater control "Best Management Practices" (BMPs) meaning those schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of surface waters. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. Reference is made to Section 104, Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Latest Edition) and F.D.E.P. NDPES Stormwater program, and Guidance for Stormwater Pollution Prevention. The applicable measures shall be implemented to minimize the transportation of silts and sediments off site and to eliminate, to the greatest extent possible, the contamination of surface waters flowing off-site or recharging on-site.

c) Stabilize all disturbed soils within seven days of no construction, project completion, or final inspection, whichever occurs first.

d) Contractors shall clean up all fugitive soils at a minimum weekly or more often as needed.

e) For those sites requiring a FDEP Permit, as described above, a copy of the Stormwater Pollution Prevention Plan shall be provided to the Hernando County Engineering Office, 1525 East Jefferson Street, Brooksville, Florida 34601, prior to commencing construction.

f) Provide a copy of the Notice of Termination to the County Engineers office when construction is complete, as above.

DRAINAGE DESIGN

Drainage Standards:

A. Valley curb shall be twenty four (24) inches wide with a minimum thickness of six (6) inches at the center, with a three (3) inch rise to the back of the curb and a one (1) inch rise to the pavement edge, 3,000 p.s.i. concrete used throughout.

B. Vertical Curb and Gutter shall conform to FDOT Index 300 Type F.

C. Vertical curbs without gutters shall be constructed using 3,000 p.s.i. concrete and be per FDOT Index 300 Type D, used on high side of road only.

D. Curb end transitions to meet FDOT Index No. 300.

E. Culvert Pipe:

1) Culvert pipe under roadways shall be steel reinforced concrete pipe, eighteen (18) inch minimum; driveway pipes may be steel reinforced concrete, corrugated metal, or HDPE. However, for side drain materials other than steel reinforced concrete a minimum of one (1') spacing is required between the non-reinforced concrete pipe material and edge of pavement and or curb. Pipe easements shall be fifteen (15) feet minimum to permit access, maintenance, and protection. Pipes with over 4 feet of cover shall be steel reinforced concrete pipe.

2) Maximum length of culvert pipe between structures shall not exceed four hundred (400) feet.

3) All pipe joints shall be wrapped with approved filter fabric per FDOT Specifications, Section 280.

4) Pipes shall be sized to accommodate a minimum 10-year 24-hour storm event.

F. Mitered End Section, all culverts under roadways or driveways shall have mitered end sections made of reinforced concrete, Plastic Flared End Sections are not allowed. Where shallow swales intersect deeper drainage ditches or DRA's, erosion control shall be provided by use of culvert pipes, concrete swales, mitered end section with spillways, or other suitable means. Cover material over culverts in swales shall be stabilized, compacted, and sodded to prevent erosion. The proposed design of reinforced concrete mitered end sections must meet current FDOT Standards.

G. Splash Pads/Rip Rap: shall be provided on all MES that have velocities of greater than 4 ft/sec for a minimum 10-year 24-hour storm event. Velocities for all pipes shall be provided and ranges shall be within prudent hydraulic engineering design standards.

H. Endwalls shall be made of 3,000 p.s.i. concrete per FDOT Index No. 250 and shall be used only outside the roadway clear recovery area.

I. Manholes or junction boxes shall be constructed of reinforced concrete. They shall be a minimum of four (4) feet inside diameter at the base with straight walls or corbelled a maximum of four (4) inches in one (1) foot, with a manhole rim cast in place for access. Inverts are to be formed to a minimum of ½ the pipe diameter. FDOT Index No. 200 and 201 shall be used with a maximum corbel height of four (4) feet and a vertical chimney height of no more than eighteen (18) inches including ring and cover. Manholes or junction boxes shall not have metal steps.

J. Inlets:

1) Curb Type: See FDOT Roadway and Traffic Design Standards Index No. 200 and 201 (Latest Edition). Bottomless inlets shall not be allowed. Curb inlets shall not be placed within curb return radii.

2) Ditch Bottom Type: Shall be constructed per (a) above with the exception that FDOT Index No. 232 Type C or greater shall be used. A FDOT Index Type F "Modified" may be used and details obtained from Hernando County Engineering Department.

K. Valley Crossing in Local Streets:

1) The design of Valley Crossings in streets will only be allowed on closed drainage system, curb, and gutter, unless otherwise approved by the County Engineer. In no case shall concrete valley gutters be less than thirty six (36) inches wide.

2) Valley Crossing shall be limited to streets that have a stop condition at intersection.

L. Swale Drainage:

1) Roadside Swale Geometry: Shall be per current FDOT Greenbook Standards.

2) Swale Erosion Protection: Swales shall be provided with permanent erosion protection. Such protection may be turf, using an approved type grass, or approved type of erosion fabric may be utilized. When turf protection is used, the swales shall be sodded a lateral distance extending from within one (1) foot of the road pavement to the top of the swale backslope.

3) Driveway Across Swales: Driveways across swales shall have an invert, or drainage pipes of adequate size place beneath them conforming to the proper flow lines for positive drainage. The culvert pipes shall have a minimum fifteen (15) inches in diameter, long enough to provide a six (6) foot wide shoulder on each side of the driveway pavement. The ends of the pipe shall be finished with mitered end sections.

M. Canals, Drainage Retention/Detention Areas, Major Waterways.

1) One twenty (20) foot DROW is required for each retention/detention area not abutting county ROW.

2) The following DRA's shall undergo geotechnical subsurface testing (at a minimum with Ground Penetrating Radar (GPR), Electrical Resistivity Imaging (ERI); Multi-Electrode Electrical Resistivity (MER), or equivalent as accepted by the County Engineer) to determine the presence of karst features or voids:

a) All planned Class A residential subdivision DRA's

b) All DRA's dedicated to the County

c) DRA's serving apartment complexes with one-half (1/2) acre or more of pond bottom and a total design depth of six (6) feet or greater

d) Any non-residential DRA's within fifty (50) feet of a residential area (measured from top of bank) with one-half (1/2) acre or more of pond bottom and a design depth of six (6) feet or greater

A report shall be delivered to the County Engineering & Planning Departments, which details the methods, mapping, results, and conclusions of the subsurface testing signed and sealed by a professional engineer or geologist. The project engineer shall sign and seal a letter to the County Engineering Department acknowledging review of the subsurface testing report; acceptance of its findings; conclusions as to the site suitability for stormwater retention; and detailing any recommendations or remediation of any karst features or voids present.

N. Design factors for known karst features within proposed platted lots.

1) Geotechnical analysis of the feature(s) shall be conducted and recommendations for remedial action provided to the Engineering and Planning Departments.

O. Flood Plains: where lands are or have been subject to periodic flooding, the County and/or FEMA have not established minimum building elevations, the Developer shall establish 100-year, and 25-year flood elevations at design flood conditions in accordance with SWFWMD and County standards.

DRAINAGE SYSTEM CONSTRUCTION

Unless otherwise approved by Hernando County, standard details and specifications for the construction of storm drainage systems shall conform to applicable sections of the following (Latest Editions):

1. Florida Department of Transportation "Roadway and Traffic Design Standards."
2. Florida Department of Transportation "Standard Specifications for Road and Bridge Construction."
3. Drainage Manual: Florida Department of Transportation (FDOT)
4. Drainage Manual, Storm Drains: Florida Department of Transportation (FDOT)

TRAFFIC CONTROL REQUIREMENTS

1. All traffic control devices shall be depicted on plans, including type, placement location and dimensions, and material and installation details in conformance with County, State, and Federal guidelines.
2. All traffic control devices shall be installed by the Developer, at his/her expense, prior to the opening of the development to public usage and travel.
3. Approved work zone traffic control, and project site security and safety plans/notes are required on the plans. Construction traffic entrance and exiting route shall be designated on construction plans.
4. Frontage roads, Major Local, Collector, and Major Collector roadways shall be striped per the MUTCD, per the conditions of design for that submittal.

SIDEWALK AND BICYCLE FACILITY REQUIREMENTS

A. Residential Streets

1. Subdivisions in all residential zoning districts, Residential Single-Family manufactured Housing Districts, and Residential Planned Development Project Districts (including single family, multi-family, mobile home, resort residential and residential components of Combined PDPs) shall include sidewalks on both sides of internal streets and on one side along the frontage of all external streets adjoined by the development.

2. Residential developments not required to include sidewalks by Section A.1 shall be required to include one of the following along Major Local, Collector and Arterial roadways:

   a. A sidewalk on one side (both sides if four or more existing or planned road lanes)

   b. Bicycle facilities along both sides

   c. A multi-use trail separated from and parallel to Major Local, Collector, and Arterial roadways.

B. County Collector and Arterial Roadways

1. County collector and arterial road pavement widening projects in urban areas (within FHWA apportioned urban boundaries) where bicycle and pedestrian facilities are planned, as part of a county network shall include paved shoulders (at a minimum) for bicycle travel.

2. County collector and arterial road pavement widening projects in urban areas (within FHWA apportioned urban boundaries) shall include a sidewalk along one side (at a minimum), except when such roads have four or more lanes sidewalks shall be included along both sides.

3. Where parallel public bicycle and/or pedestrian facilities exist or are planned in close proximity to and are (or are planned to be) accessible from county arterial and collector roads, pavement widening projects on these roads may not include additional bicycle and/or pedestrian facilities.

4. All developments fronting county collector and arterial roads in urban areas shall include a sidewalk along one side of all county collector and arterial roads fronted by the development and shall be required to include onsite pedestrian features i.e., sidewalks, crosswalks, etc., built to connect the development to the existing or planned sidewalk(s).

5. Where it is not practical (as determined by the County Engineer based on planned road widening within 5 years or incomplete planning to determine sidewalk locations, or environmental constraints) to construct a required sidewalk, the developer may contribute funds equivalent to the cost of the required sidewalk fund for the area.

A. Frontage Roads

1. Frontage roads shall include a sidewalk on at least one side.

2. Development (residential and nonresidential) occurring adjacent to existing frontage roads with existing or planned (to a sufficient degree to determine location) sidewalk(s) shall include onsite sidewalk(s) built to connect to the existing or planned sidewalk(s). However, when the existing or planned sidewalk is on the opposite side of the pavement from the development, onsite sidewalk(s) shall be required to connect to the edge of pavement at a suitable location for pedestrian traffic to safely cross the pavement to reach the sidewalk, and shall include signed and marked pedestrian crossing(s). Developments constructing frontage roads shall include sidewalks as part of frontage road construction.

3. Development occurring adjacent to existing frontage roads without existing or planned (to a sufficient degree to determine location) sidewalks shall be required to include onsite sidewalk(s) built to the property line.

4. Development occurring adjacent to frontage roads shall include pedestrian connections to adjoining properties.

D. Development Proximate to Planned Bicycle and Pedestrian Facilities

1. Development adjoining (or including) planned or existing bicycle and pedestrian facilities where there are gaps in incomplete networks shall construct the portion(s) necessary to continue the planned or existing facilities adjacent to (or through) the development.

E. ADA Ramps and Recessed Curbing

1. FDOT Indexes 304, 310 and FDOT Spec 527 shall be followed for all ADA ramps and recessed curbs. The developer of the subdivision shall place all recessed curbs during construction. For the detectable warning surface (truncated domes) only the Armorcast Detectable Warning Tile (red or yellow) S527-0012 in or equivalent from the FDOT Qualified Products List shall be acceptable. A tapered edge tile shall be used on all approach sides.

2. Local roads with Tee intersections shall have a minimum of 3 curb recesses/ramps for unimpeded ADA access. All ramps shall be at 45 or 90 degrees to the roadway, so that pedestrians cross and arrive perpendicular to the ramp/sidewalk. Curb ramps should align with crosswalks.

3. Collector and higher-level roads shall have their ADA ramps coordinated with the County Engineers Office prior to design.

LOTS AND LOT GRADING

A. Lots with side setbacks or easements of less than seven and one-half (7.5) feet require an Engineered Site Plan to show effective drainage that minimizes impacts to surrounding properties and conforms to the local drainage pattern. This shall specify whether slab on grade or stemwall construction. Only applies to lots ½ acre and smaller.

B. Lots with a 5’ setback that exceed 8” difference in F.F.E. between them shall be designed with a stem wall or retaining wall to be constructed by the homebuilder. Lots with a 7.5’ setback that exceed 18” difference in F.F.E. between them shall be designed with a stem wall or retaining wall. Lots with a 10’ setback that exceed 28” difference in F.F.E. between them shall be designed with a stem wall or retaining wall. All stemwalls and retaining walls are to be shown on the subdivision plans. Only applies to lots ½ acre and smaller.

C. All lots being developed shall have provisions made to receive stormwater flows from offsite properties so they do not impact their construction, to preclude erosion and flooding.

D. All lots graded, as B/C shall have the rear swales in place during the construction of the subdivision.

E. All lots on subdivision plans shall show Finished Floor Elevation (FFE), not pad elevations. Typical pad elevation is from 6 inches to 1 foot below FFE.

F. A final drainage inspection is required on all residential construction to verify the drainage was constructed properly.

G. All lots shall be final graded in accordance with approved drainage plans. All building pads shall be prepared in accordance with the County accepted geotechnical report and related guidelines, which require the removal of all yielding clays, muck, and/or organic materials to a minimum two (2) feet below the building foundation. Temporary ground cover, sod or seed and mulch, shall be planted and maintained on all disturbed areas prior to issuance of certificate of occupancy for the home, and prior to passing final inspection for the subdivision.

EXCAVATION AND STOCKPILES

Setbacks, buffers, berms.

A. Setbacks. The following minimum distances from the permittee's property line shall be maintained for the identified adjacent property uses:

1) Residential subdivisions (lots less than one acre), multifamily, hospitals, life care centers: Stockpiles: Five hundred (500) feet

2) Commercial, office, institutional, active and developed passive recreation, agriculture/residential subdivision (lots one acre and larger): Three Hundred (300) feet

3) Agriculture, industrial, utility, public roads, forest, open space: Stockpiles: One hundred (100) feet

4) A six-foot stockpile is acceptable for lots that are smaller in size that cannot accommodate the above setbacks.

B. Stockpile locations should be shown on the plans. All necessary BMPs shall be implemented to control fugitive dust and erosion.

PLANS AND SPECIFICATIONS SUBMITTALS

As a condition for approval of site plans, the developer shall furnish complete plans and specifications prepared, signed, sealed, and dated by a Professional Engineer licensed to practice in the State of Florida, which shall include the following:

1. Legible plans using good drafting practices. Specific design / construction elements should be shown on separate sheets.

2. Overall, site and drainage plans scaled at 50, 100, or 200 feet per inch. Construction sheets scaled at 10, 20, 30, 40, or 50 feet per inch.

3. An index of all sheets included in the plans with drawing number references, index shall be alphabetical, numerical, or alphanumerical order.

4. A location map scaled to show project location, surrounding streets, and a minimum of one arterial roadway; with all mentioned streets labeled.

5. A topographic map of the development related to mean sea level datum, with contours shown at not greater than one-foot intervals. The existing and proposed lot and street grading is to be shown. Lot grading shall be shown on all lot corners and break points.

6. A drainage map of the basin or basins within which the development lies, inclusive of immediate off site drainage. The map may be combined with the above topographic map, but in any event must include suitable topographic data acceptable to the County Engineer. All ridges outlining the basins and the sizes of the basins in acres must be shown. The outlines and sizes in acres of all

existing and proposed drainage areas within the basin shall be shown and related to corresponding points of flow concentration. Flow paths shall be indicated throughout, including final outfalls from the subdivision and basins.

7. Drainage data, assumed criteria and hydrologic and hydraulic calculations meeting the requirements of this document and Southwest Florida Water Management District.

8. Plans showing the proposed design features and typical sections of canals, swales and all other open channels, storm sewers, all drainage structures; plan, profile, and cross sections of roads, driveways, and curbs; sidewalks and ramps; permanent and work zone traffic control; and other proposed development construction. Plans shall have all drainage structures and DRA's numbered. Roadway Typical Sections shall show proposed utility locations. Design shall meet requirements of this document.

9. Existing natural and made features on and abutting the project site, including roads and curbs, intersections, driveways, sidewalks, canal and swales and other drainage features and structures shall be shown in the plans. Where proposed roads intersect existing roads, elevations, and other pertinent details shall be shown. Design shall meet the requirements of this document.

10. Construction entrances and truck routes to/from the site to all major roads. All construction vehicles going to from the site will utilize these routes. This includes builders and contractors in subdivisions, after the infrastructure is constructed.

11. Specifications to cover construction of all the work proposed, providing for good workmanship and standard practices of construction to achieve the desired finished product as designed by the engineer and accepted by the County Engineer. These specifications shall meet or exceed specifications as referenced in this document.

12. Copies of all required permits, approvals, and other necessary documents shall be provided to the Office of the County Engineer prior to site plan approval.

13. All survey data for new construction shall be in NAVD 1988 and clearly labeled.

14. Digital format (DWG) as builts shall be submitted prior to the final inspection and granting of the C.O. for all subdivisions.

ADMINISTRATIVE DESIGN VARIANCES

A. Purpose: The purpose of an Administrative Design Variance is to document site and item specific variances to guidelines, standards, and practices in the preparation of design plans for civil engineering improvements. Many factors influence the design of commercial and subdivision improvements, including: natural features and topography, land boundaries, existing infrastructure and conditions, regulations, policies, political requirements, and engineering practices. The Administrative Design Variance provides for the responsible engineer from the County the ability to acknowledge and approve an engineering design that does not necessarily meet current County design standards and guidelines, yet still provides for significant protection to the public's health, safety, and welfare.

B. Practice: The design engineer shall submit in writing a request for an Administrative Design Variance for each site / project. This request must detail each specific design variance and include:

   1. Location on site of the proposed variance;

   2. Type of proposed variance;

   3. Design standard from which the variance is requested;

   4. Intended result / effect of each proposed variance;

   5. Mitigating actions, if any;

   6. Reason / justification of the proposed variance;

   7. Other supporting information, as applicable.

C. Approval: Written approval and confirmation for each design variance request must be issued prior to inclusion in future plan submittals.

D. Liability: Administrative Design Variances do not relieve the design "Engineer of Record" from liability of his/her chosen design and/or actions.

EXPENSE AND RESPONSIBILITY FOR TESTING

A. The developer shall submit to the County Engineer the name of testing laboratory he/she intends to employ for approval prior to starting any construction activities. The Developer will pay for the expense of testing materials and construction. All testing shall be submitted for approval by the County Engineer prior to commencing the next phase of construction, rough grade, underground utilities and storm drain, sub-base, base, wearing surface, final grade and erosion control.

B. Upon completion of all improvements required, the Developer's engineer shall submit a statement certifying to the best of his/her knowledge, periodic observation and contractor provided record drawings; that the project has been constructed to plans and specifications originally approved by the County Engineer. Accompanying this statement shall be a construction report showing where tests were made, who made them, when they were made, and what the results were. Testing shall be in accordance with "Hernando County minimum Testing Frequency Requirements" as prepared by the Hernando County Engineering office (See Section II, these Guidelines). Copies of test reports shall be furnished to the Hernando County Engineering Office after the test has been completed. Where test reports show non-compliance with specifications, corrective work shall be started immediately.

C. The County may request additional testing by the independent and certified testing laboratory approved by the County. Principles and/or owners of the approved testing laboratory shall not have financial interest in the company performing the work. Costs associated with performing additional testing shall be paid for by the County or the Developer by one of the following methods:

1. If the Developer's test complied with the approved specifications and appropriate standards, and the County's test showed otherwise, then the Developer would pay for the additional test(s).

2. If the County's test result also showed compliance with the approved specifications and appropriate standards, the County will pay for the testing.

AUTHORITY OF COUNTY INSPECTOR

A. County Inspectors may inspect all construction, all materials and may inspect preparation or manufacture of supplies. The County Inspector is not authorized to revoke, alter, or waive any requirements of the specifications, but he/she is authorized to call to the attention of the Developer any failure of work or materials to conform to the plans or specifications.

B. The County Inspector in no case shall act as foreman or perform other duties for the Developer, and shall not interfere with the management of the work. Any advice that the County Inspector may give to the Developer shall in no way be construed as binding to the County Engineer or releasing the Developer from carrying out the intent of the plans and specifications.

C. The County Engineer or his/her Inspectors, at any time they perceive a hazard or non-compliance with approved plans, may stop any work within the public right-of-way.

SECTION II

TESTING & CERTIFICATION

SECTION II TESTING, CERTIFICATION & AS-BUILTS

AS-BUILTS

The Subdivision As-Builts (record drawings) will include a certificate of completion from the Engineer of Record stating: The project was built to substantial completion based upon his/her onsite observation of construction. Both the original design and the constructed condition must be clearly shown. Revisions made during construction will be clouded to reflect deviations from the approved construction plans observed by the Engineer.

At a minimum the following shall be verified on the as-built drawings:

1. Discharge structures, side bank and under drain filters or trenches; weirs, pipes, orifices, skimmers, etc.
2. Storage areas for treatment and attenuation; dimensions, elevations, contours, or cross sections.
3. System grading information to determine contributing drainage areas, flow directions and conveyance of runoff to the system discharge point.
4. Conveyance; dimensions, elevations contours, final grades or cross sections of systems utilized to divert off site runoff.
5. Water levels; existing water levels and date determined.
6. Benchmarks; location and description of all benchmarks
7. Lot grading-Final Pad elevation, corners of the lot grades of rear lot swale elevations every 4 lots or 300 feet whichever is greater.

CERTIFICATION OF SUB DIVISIONS

This statement must be included in the certification letter provided by the Engineer of Record for subdivisions.

I hereby certify to the Board of County Commissioners of Hernando County, Florida that the improvements have been inspected for the above referenced subdivision and found the improvements shown on the approved plans have been fully and satisfactorily completed in substantial accordance with the approved plans. It also complies with the requirements of the Southwest Florida Water Management District (SWFWMD) permit and the National Pollution Discharge Elimination System (NPDES) Permit obtained for this project.

I enclosed two prints of the record drawings and one digital copy of the record drawings in .DWG (CADD) format, which depict approved construction plans as modified, including dimensions and elevations, including lot grade and rear lot swale elevations every 4 lots or 300 feet whichever is greater. Also included are two copies of the testing reports provided by the independent testing laboratory, that I certify to be in compliance with Hernando County Standards and the approved plans.

TESTING & SCHEDULE

Testing shall be accomplished by an independent and certified testing laboratory. Principals and/or owners of the testing laboratory shall not have any financial interest in the company performing the work. Any failures in test will be corrected and retested prior to the continuation of work at that location. The project will not be acceptable until all tests and verification thereof have been submitted to and approved by the County Engineer. The Contractor shall pay for any retesting due to evidence of failure in the original test. The developer will pay for the expense of testing materials and construction. All testing shall be approved by Engineer of Record prior to commencing the next phase of construction, rough grade, under ground utilities and storm drain, sub-base, base, wearing surface, final grading and erosion control. The test results shall be in a format that provides the test result, the standard it was supposed to meet and whether it passed or failed. The test lab or engineer of record will certify that all testing met Hernando County Standards.

The following is a list of minimum test requirements respective to various items of work:

ITEM	TEST	TEST IDENTIFICATION	TEST REQUIREMENTS	TEST FREQUENCY
Base	Maximum Density, Optimum Moisture	AASHTO T-180-C, ASTM D1557-C, FM 5-515	LBR 100	One per source, density test per 10,000 sq. ft. of parking area
	Thickness, Field Density	AASHTO T191, T310, ASTM D1556, D2922	98% of Maximum Density, AASHTO T-180-C, 1/2" tolerance	Each 6" course every 300 feet, staggered left and right of centerline.
	Gradation, Atterburg Limits	FLORIDA DOT	FLORIDA DOT Sec 911	One Per source
Stabilized Subgrade	Bearing Values	Florida DOT LBR, FM 5-515	Minimum 40 LBR	One per Material Type*
	Maximum Density, Optimum Moisture	AASHTO T-180-C, ASTM D 1557	N/A	One per Material Type
	Thickness, Field Density	AASHTO T191, T310 ASTM D1556, D2922	98% of Maximum Density AASHTO T-180-C, 1/2" tolerance	Test shall be no more than 300' apart under curbs and centerlines (staggered). No less than one per street.
Concrete	Slump Test	AASHTO T-119-82, ASTM C143	Florida DOT	One per set of cylinders
	Compressive Strength Cylinders	AASHTO T23-80, ASTM C31-69	Florida DOT Sec 346-5	One set of 3 cylinders for 100 Cubic Yards or Fraction thereof placed each day as called for by the engineer (1 to be tested at 7 days, 1 at 28 days and 1 hold)
	Air Content	AASHTO T199-82	Florida DOT	Florida DOT, One per days production
Asphaltic Concrete	Rolling Straight Edge Or Longitudinal Laser Profiler	Florida DOT, FM 5-509	Florida DOT	Florida DOT
	Aggregate Analysis	Florida DOT	Florida DOT	One per Design
	Design Mix	Florida DOT	Florida DOT	One per Test
	Bitumen Content	Florida DOT Modified, AASHTO T164	Florida DOT	One per Day
	Graduation Stability Flow	Florida DOT	Florida DOT	One per Day
	Field Density	ASTM 02950-91	95% of Lab Density	One Density each course every 300L.F. or One density per 10,000 S.F of parking area
	Properties Of In-Place Materials	Marshall (Asphalt Institute MS-2)	Florida DOT	One per Day
	Thickness	Florida DOT	Florida DOT, ¼" tolerance	One thickness each course every 300 L.F.
Embankment	Maximum Density, Optimum Moisture	AASHTO T99, ASTM D698.78	Florida DOT Sec 120	Per Soil Type
	Field Density	AASHTO T 191, T310, ASTM D1556, D2937, D2922	100% of Maximum Density, AASHTO T-99	One per 500' horizontally, alternating lifts (1 ft.)
Utility Trench Backfill under roadways and structures	Maximum Density, Optimum Moisture	AASHTO T99, ASTM D698.78	N/A	Per Soil Type
	Field Density	AASHTO T 199, ASTM D1556, D2937, D2922	100% of Maximum Density, AASHTO T-99	**
Backfill of Structures	Maximum Density, Optimum Moisture	AASHTO T99, ASTM D698.78	N/A	Per Soil Type
	Field Density	AASHTO T 191, T310, ASTM D1556, D2937, D2922	100% of Maximum Density, AASHTO T-99	Each Lift, but not to exceed 1' vertically

** Test shall be located no more than 300' apart. Tests shall be performed on each lift, except that tests shall not be further apart than one foot vertically, every 300 linear feet or part there or, and centerline of each roadway. Field Densities shall be taken over all road crossings. Field Densities for Sanitary lines shall be staggered to include results over service laterals. There shall be a minimum of one test series for each one foot of lift over pipeline between manholes.