

**EXHIBIT 25A, BROWARD COUNTY
ADMINISTRATIVE CODE**

**MINIMUM
STANDARDS**

**Applicable to Public Right-of-Way
Under Broward County, Florida
Jurisdiction**



**PUBLIC WORKS AND TRANSPORTATION DEPARTMENT
Highway Construction and Engineering Division**

October 25, 2005

EXHIBIT 25A, BROWARD COUNTY ADMINISTRATIVE CODE

MINIMUM STANDARDS APPLICABLE TO PUBLIC RIGHT-OF-WAY UNDER BROWARD COUNTY, FLORIDA JURISDICTION

The "Minimum Standards Applicable to Public Right-of-Way Under Broward County Jurisdiction" has been developed and compiled by the Engineering Division of the Broward County, Florida, Department of Public Works under the authority granted to the Broward County Board of County Commissioners by Ordinance Number 85-74, adopted by the Board on November 2, 1985, and included in Sections 21-18 through 21-23 of the Broward County Code.

The "Minimum Standards," as it is also known, was attached to and made part of Resolution Number 85-3606, Item 14B, adopted by the Broward County Board of County Commissioners on November 12, 1985, concurrently with Ordinance Number 85-74.

The "Minimum Standards" became effective on December 1, 1985.

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TITLE AND INTENT

1. TITLE: This body of regulations shall be known as the "Minimum Standards Applicable to Public Right-of-Way under Broward County Jurisdiction," and may be referred to as the "Minimum Standards," as is done hereinafter. These Minimum Standards shall apply to both existing and proposed public right-of-way, as defined herein, under Broward County jurisdiction.

2. INTENT

2.1 Intent of the Minimum Standards: The intent of the "Minimum Standards" is to provide for the safe and orderly use and development of public right-of-way under Broward County jurisdiction, to the end that the needs and interests of the public are served as fully and efficiently as possible. The regulations embodied herein have been made as broad as possible to serve as standards of quality to maintain the necessary uniformity in the utilization of the public traffic corridors, and are intended to express the minimum acceptable level. Those whose standards are higher are encouraged to follow them to the extent possible.

2.2 Permit Issued Prior to the Effective Date of Minimum Standards: Any permit issued prior to the effective date of these "Minimum Standards" shall be valid on the terms under which it was issued, except that such permit shall be subject to the provisions of Chapter 4, Sections 4-1 and 4-2 of this document.

3. APPLICATION TO EXISTING FACILITIES

3.1 Application of Provisions of Minimum Standards to Existing Facilities: With the exception of conditions described in Section 3.2 below, the provisions of the "Minimum Standards" do not apply to existing facilities in public right-of-way, but, except as otherwise approved, apply to any major alteration, extension or maintenance performed upon them from the effective date of these regulations, forward.

3.2 Facility Within Public Right-of-way: Any facility within public right-of-way that is found by the Highway Construction and Engineering Division to be interfering in any way with the convenient, safe or continuous use, or the maintenance, improvement, extension or expansion of any public road under Broward County jurisdiction shall be removed or relocated, as directed by the Highway Construction and Engineering Division, pursuant to Florida Statute 337.403.

CHAPTER 1 – STANDARDS

- 1-1 Appendix D, lists by name, address and website address those agencies, associations, institutes, societies, etc., who are referred to in this document by name, initials or symbol.
- 1-2 The referenced Standards included in this document are intended to supplement, not supersede the requirements otherwise set forth herein and, in every case, the "latest revision" shall apply. Where differences occur between referenced Standards and the "Minimum Standards," the more stringent shall apply.
- 1-3 In addition to the provisions of the referenced Standards stated to be mandatory, all recommendations in the referenced Standards shall also be considered mandatory.
- 1-4 The referenced Standards shall apply only to those portions of this document in which the referenced Standards appear. Where the referenced Standards appear to regulate other topics specifically covered by this document, such regulations shall not apply.
- 1-5 Only those portions of the referenced Standards shall apply, that are directly related to the purpose(s) of the subsection(s) of this document in which they are referenced. Where portions of referenced documents concern other, extraneous matters, such portions shall not be mandatory.
- 1-6 Where the method of installation of materials or equipment is not specified in this document, the installation shall be in accordance with the manufacturer's technical recommendations or specifications.

CHAPTER 2 – DEFINITIONS

Whenever the following terms, or pronouns in place of them, appear in these standards, the intent and meaning shall be construed as follows:

Approvals: Where any term such as “approved,” “or equal,” “accepted,” “permitted” appears in this document, it shall be construed to mean “by” or “in the judgment of the Highway Construction and Engineering Division,” unless specifically noted otherwise.

Arterial Roadway: A general term denoting a highway primarily used by through traffic, usually on a continuous route or a highway designated as part of an arterial system.

Board: The Board of County Commissioners of Broward County, Florida.

Clear Zone: The unobstructed relatively flat area, impacted by construction extending outward from the edge of a travel lane to a fixed object, available for safe use by an errant vehicle.

Collector Roadway: A term denoting a highway that in rural areas connects local highways to arterial highways and in urban areas provides land access and traffic circulation within residential, commercial and business areas, and connects local highways to arterial highways.

Contractor: The person or entity, certified by the Broward County Central Examining Board for Engineered Construction Trades or by the Florida Construction Industry Licensing Board for the class of work to be performed and responsible for the work to be performed, or the utility company or governmental subdivision engaged in construction on its own facility using its own employees.

County: Broward County, Florida, a political subdivision of the State of Florida within which these standards apply, and in whose area of jurisdiction the work is to be performed.

County Inspector: An authorized representative of the County.

Engineer: The Engineer of Record, licensed by the State of Florida (or a representative of the Engineer of Record) whose plans and specifications have been approved by the Highway Construction and Engineering Division, for a specific project.

EPD: The Broward County Environmental Protection Department.

FDOT: The State of Florida, Department of Transportation.

Green Book: The State of Florida, Department of Transportation “Minimum Standards for Design, Construction and Maintenance of Streets and Highways,” as amended.

Highway Construction and Engineering Division: The Highway Construction and Engineering Division of the Broward County Public Works and Transportation Department.

Maintenance Security: An approved form of security furnished by the permittee as a guaranty of good faith that permittee shall perform any maintenance or repairs in accordance with the terms of the permit. This security shall remain in effect for one (1) year after the permitted work has been accepted by the Public Works and Transportation Department.

Maintenance of Traffic (MOT) Plan: A plan that denotes how vehicular and pedestrian traffic shall be maintained throughout a construction area.

Material: Materials incorporated in the project, or used or consumed in the performance of the work .

Minimum Standards: "Minimum Standards Applicable to Public Right-of-Way Under Broward County Jurisdiction" as adopted by the Broward County Board of County Commissioners, as amended.

NGVD: National Geodetic Vertical Datum.

P.E.: Professional Engineer, registered in the State of Florida.

Permittee: The person or entity to whom the permit to perform work in public right-of-way under Broward County Jurisdiction is issued.

PSM: Professional Surveyor and Mapper, registered in the State of Florida.

Plans: The plans approved by the Public Works and Transportation Department which show the location, character, dimensions, and details of the work to be done.

Proposed Public Right-of-Way: Land usually in a subdivision, to be developed prior to dedications and, upon completion, to be dedicated to the public, pursuant to a prior agreement between the developer and the County Commission.

Public Right-of-Way/ Easements: Public right-of-way/easements include:

1. Land, with the exception of State road right-of-way, dedicated or deeded, to the public and used or to be used for a roadway, alley, thoroughfare, walkway, bikeway, path, trail, access for ingress or egress, Mass Transit facilities or other related purpose by the public, as authorized by the governing body having jurisdiction
2. All easements dedicated to the public for discharge of storm water from County right-of-way

Public Works and Transportation Department: The Broward County Public Works and Transportation Department

Qualified Applicant: Any current County franchisee or utility regulated by the Florida

Public Service Commission, seeking permission to obstruct, or work in public right-of-way, on its own facilities, utilizing its own employees or;

Any person, or entity currently licensed to engage in contracting in Broward County and certified by the County Central Examining Board for Engineered Construction Trades or by the State Construction Industry Licensing Board to perform the class(es) of work in public right-of-way for which a permit is being sought or;

Any political subdivision of the State of Florida performing work in public right-of-way on its own facilities, using its own employees.

Shop Drawings: Drawings that show details pertaining to materials and facilities to be installed in conjunction with the project.

Specifications: The directions, provisions, and requirements contained in the plans or in the contract documents, setting out or relating to the method and manner of performing the work, and/or the quantities and qualities of materials and labor to be furnished under the contract.

Standard Index: FDOT "Design Standards"

Subcontractor: A person, firm or corporation currently licensed to engage in contracting in Broward County, who is certified by the Broward County Central Examining Board for Engineered Construction Trades or by the Florida Construction Industry Licensing Board for the class of work to be performed, and who is contracted to perform all or part of the work required under another Contractor's contract.

Security: A cashier's check, certified check, irrevocable letter of credit, or cash accompanied by a Cash Security Agreement furnished by the permittee to guarantee contract performance and/or maintenance, in a form acceptable to the County.

Swale: A low-lying area located between the edge of pavement and a public right-of-way line of a roadway, which is used for the conveyance and/or retention of storm water run off within road right-of-way.

Traffic Control Manuals: The State of Florida, "Design Standards," Index 600 series and FHWA "Manual on Uniform Traffic Control Devices" (MUTCD), as amended.

Traffic Engineering Division: The Traffic Engineering Division of the Broward County Public Works and Transportation Department.

Traffic Engineering Standards and Specifications: The standards and specifications maintained by the Broward County Traffic Engineering Division. This includes, but is not limited to: signage, pavement markings, signalization and all other Traffic Engineering related facilities.

USDOT: United States Department of Transportation

Utility: For purposes of this document, any water, sewer, gas, drainage, irrigation

or culvert pipe and any electric power, telephone, signal, communication, fiber optic, cable T.V. conduit or cable, or operator thereof, serving the public, shall be considered a utility.

Utility Inspector: An authorized field representative of any utility owner serving the area where work is performed.

CHAPTER 3 – GENERAL PROVISIONS

3-1 PUBLIC AND OCCUPATIONAL SAFETY

3-1.1 Compliance Requirements: All work in public right-of-way shall be done in strict compliance with the rules and regulations of the Traffic Control Manuals, the Occupational Safety and Health Administration, the Americans with Disabilities Act and the Broward County Public Works and Transportation Department. Failure to comply shall result in cessation of operations and the removal of project-related obstructions from public right-of-way until compliance is achieved.

3-1.2 Certification Required: All work in any public right-of-way under Broward County jurisdiction shall be performed by a licensed Contractor unless otherwise provided hereinafter.

3-1.3 Maintenance of Traffic Plans Required

3-1.3.1 Maintenance of Traffic Instructions/Requirements

An approved Maintenance of Traffic (MOT) Plan shall be required any time work is being performed within public right-of-way regardless of whether a permit is required or not. A MOT Plan shall conform to the Broward County Minimum Standards, and Traffic Control Manuals. The approved MOT plan and a copy of the permit, if applicable, shall be onsite at all times. The MOT is valid for the duration of the permit or completion of the project, whichever comes first. All MOT set-up or removal shall be performed by the permittee.

Approval of a MOT Plan requires a minimum of two County work days from the time of receipt of all complete plans prior to issuance of the approval. Additional time may be required for complex plans.

A MOT Plan shall include:

1. The Maintenance of Traffic Submittal Form.
2. A project location map.
3. An applicable FDOT Design Standard Index from the 600 Series and/or a figure from the MUTCD, which represents the roadway on which the work is being performed. All indexes used in Broward County shall be urban indexes.
4. A sketch for non-typical conditions, which include taper lengths, lane shift lengths, lane shift widths, sign spacing, barricade or cone spacing, pavement markings, removal of pavement markings, signal locations, etc.
5. The indexes shall include the name of the roadways represented and a north arrow.
6. Legible FDOT Standard Index notes.
7. A current FDOT approved certification of the Worksite Traffic Supervisor in charge of the project. The certification card shall contain the name,

certificate number, course category (Intermediate: BT-05-0078 or Advance: BT-05-0079), and certificate expiration date. An Intermediate Level Certification Card shall be required for the FDOT Design Standards or a figure from the MUTCD. An Advance Level Certification Card shall be required for all non-typical condition plans that are submitted with the standard index.

8. The MOT submittals shall cover all phases of construction.
9. The sign-off sheet shall be labeled with the project name and/or location of the project if applicable and construction duration.

3-1.3.2 Vehicular: Temporary measures shall be taken to provide a minimum of one (1) lane of traffic in each direction on a four (4) lane divided highway, and two (2) lanes of traffic in each direction on a six (6) lane divided highway. Single-lane closures on a two-way roadway, double-lane closures, and road closures may require work to be done at night or on the weekend. These conditions shall be determined on a case-by-case basis. The permittee shall maintain suitable vehicular access to property abutting affected public right-of-way and access to mass transit facilities at all times.

When a roadway is closed to through traffic and local traffic, the permittee shall use forty-six (46) inch high water-filled barrier walls which have been approved by the FHWA, or are listed on the Qualified Product List for Type III barrier walls. Barricades shall be placed perpendicular to the roadway. Road Closed signs, and any other MUTCD required devices shall also be placed perpendicular to the roadway. On a roadway with curb and gutter, the water-filled barrier walls shall be set from an edge of a curb to edge of a curb. On roadways without curb and gutter the water-filled barrier walls shall be set up from the inside edge of the sidewalk to the inside edge of the sidewalk leaving the sidewalk open to accommodate pedestrians, unless provisions have been made to detour pedestrians. Concrete barrier walls shall not be permitted perpendicular to the roadway.

When a road closure is necessary for more than one (1) daylight period, a message board or post-mounted sign (forty-eight (48) inches by forty-eight (48) inches) in each direction of travel shall be required. The message board or post mounted sign shall be in place one (1) week prior to the closure. If a message board or a post mounted sign is used, it shall remain in place until the roadway is opened. If the opening date is extended, the dates on the signs shall be changed as soon as the new date is known, to reflect the proper date of the road opening.

If a hazardous condition is created by removal of guardrail or any other protective device, barrier walls, in accordance with FDOT "Design Standards," shall be installed by the permittee.

If a drop-off of greater than two (2) inches occurs during construction within the clear zone, protective devices shall be provided per FDOT "Design Standards."

3-1.3.3 Permittee Responsibilities: Upon approval of a MOT plan, permittee shall provide written notification to Emergency Services, Mass Transit, School Board Pupil Transportation, the Highway Construction and Engineering Division, the Traffic Engineering Division, and all businesses, and homeowners whose property abuts the limits of construction for the project, five (5) work days prior to the

commencement of work. All letters shall be on the permittee's letterhead and shall include the name and telephone number of a contact person. Exception may be granted for bona fide emergency work.

Permittee shall be responsible to maintain all signs and street lighting within the construction zone.

Permittee shall provide a twenty-four (24) hour emergency phone number of a person responsible for replacing/maintaining all "STOP," "YIELD," "STREET NAME," "DO NOT ENTER," and "WRONG WAY" signs, and any other regulatory signs.

The emergency contact person shall have six (6) hours to replace any missing or damaged signs after notification. If they do not respond within six (6) hours, the County may correct the problem, and the permittee shall be charged the actual costs incurred to perform the work.

3-1.3.4 Neighborhood Improvement Projects: The Broward County Emergency Vehicle Access Detail Sheet shall be followed when closing a road.

Broward County shall only allow every other street to be closed during the construction of a grid section neighborhood. Exceptions may be granted by the Highway Construction and Engineering Division on a case-by-case basis.

Where an edge of pavement is removed, Type II Barricades shall be installed to delineate the travel lane until the pavement is restored. The maximum allowed distance, each side of the road, shall be as specified by the Traffic Engineering Division.

3-1.3.5 General Control Devices Requirements: Advance Warning Signs (forty-eight (48) inches by forty-eight (48) inches) are required on all public right-of-way unless otherwise indicated on the approved MOT plan. All "End of Construction" signs larger than ten (10) square feet shall be double post mounted.

All Advance Warning Signs which remain in place for more than one (1) daylight period shall be post mounted.

All barricades which remain in place for more than one (1) daylight period shall be sand bagged.

Cones, if used, shall be thirty-six (36) inches in height with reflective collars.

Lighted barricades shall be used after daylight. Cones shall not be permitted after daylight.

All traffic control devices used within public right-of-way shall be on FDOT Qualified Product List (QPL).

3-1.3.6 School/Pedestrian: All school pedestrian routes shall be maintained throughout the project. Any deviations shall require prior written approval by the Highway Construction and Engineering Division.

3-1.3.7 *Signalization*: All vehicle detection devices shall be maintained for the duration of the project. Any deviations shall require prior written approval by the Traffic Engineering Division. All Traffic Engineering communications facilities located within the project limits shall be maintained throughout the project.

3-1.4 *Maintenance of Public Right-of-Way during Construction*

3-1.4.1 *Maintenance Requirements*: Public right-of-way shall be maintained by the permittee in a safe and functional condition until the permitted work is complete and the public right-of-way is restored and accepted for maintenance by the Highway Construction and Engineering Division, and by all other regulatory agencies having jurisdiction.

3-1.4.2 *Maintenance Period*: The provisions of this Section shall be in effect under all weather conditions, twenty-four (24) hours per day, every day, from the commencement of work until final acceptance by the Public Works and Transportation Department, except in time of emergency, when the Public Works and Transportation Department shall issue special instructions to the permittee. The provisions of Section 3-1.1 of this Chapter, however, shall apply at all times.

3-1.5 *Access to Safety and Utility Control Devices*: Excavation for pipe, structures or cable laying operations shall be conducted in a manner that shall cause the least interruption to pedestrian and vehicular traffic and to Mass Transit patrons. To the extent possible, fire hydrants, valve boxes, fire and police call boxes and other such safety and utility devices shall be left unobstructed and accessible during the construction period. When such obstruction is unavoidable, it shall be held to the minimum, and the permittee shall give sufficient notice to the affected parties to allow other provisions to be made.

3-1.6 *Underground Facility Damage Protection Act*: Prior to commencement of any work in any public right-of-way permittee shall notify the Sunshine State One-Call of Florida, Inc. for underground facility locations, as set forth in the "Underground Facility Damage Prevention and Safety Act" of the State of Florida, Chapter 556 Florida Statutes.

3-2 PERMIT REQUIREMENTS

3-2.1 *Permit Requirements*: A permit is required for all construction in public right-of-way, both existing and proposed, under Broward County jurisdiction, except as provided in Sections 3-2.1.1, 3-2.2 and 3-2.3 below. Such permits shall only be issued by the Highway Construction and Engineering Division to a licensed Contractor.

3-2.1.1 *Minor Construction or Maintenance Work*: Work such as installation of water meters (up to two (2) inches) at existing service laterals, cable splice pits not in or within two (2) feet of a roadway, street light or traffic signal maintenance, or similar types of work may be done without permit or prior notice to the Highway Construction and Engineering Division. However in all cases a MOT plan shall be required, if deemed necessary by the Traffic Engineering Division. This is not to be construed as including cable replacement or any other type of facility upgrading or rehabilitation involving excavation, except for splice pits.

Pits for such minor construction shall be backfilled or plated any time work has not been performed in the pit for forty-eight (48) consecutive hours.

3-2.1.2 Change of Contractors: In the event there is a change of permittee for any permitted work, the new permittee shall not proceed with any activities in public right-of-way until a new permit has been issued. The new permit shall not be issued until all necessary releases and other required documentation has been received from the prior permittee.

3-2.2 No Construction before Permit: Except as provided hereinafter, no construction shall be initiated until a permit for the proposed installation has been issued by the Highway Construction and Engineering Division.

3-2.2.1 Work Inside of Existing Maintenance Access Structures: Permits shall not be required for work inside of existing maintenance access structures or handholes within public right-of-way unless such work, as determined by the Highway Construction and Engineering Division, involves disruption of, or a hazard to, pedestrian and/or vehicular traffic in public right-of-way.

If there is a disruption to either pedestrian or vehicular traffic, an approved MOT plan shall be required as set forth herein.

3-2.2.2 Tree Trimming: Permits shall not be required for tree trimming in public right-of-way, but the Highway Construction and Engineering Division shall be given twenty-four (24) hours prior written notice of such activity, and proper traffic maintenance, in accordance with MUTCD, shall be established at the site prior to the start of trimming. Where any traffic lane shall be obstructed, a "Construction Ahead" or "Right/Left Lane Closed" sign shall be conspicuously placed at least five-hundred (500) feet in advance. A flashing, lighted arrow board shall be displayed in the closed lane, with transitioning traffic cones placed twenty-five (25) feet on center.

At no time shall personnel, material or equipment be allowed to create a sight obstruction (based on AASHTO sight triangle considerations).

3-2.2.3 Planting and Irrigation: A permit and Beautification Agreement are required anytime landscape, hardscape and/or irrigation is to be installed in public right-of-way. See Chapter 17, Section 17-1.1.4 for Beautification Agreement requirements. The provisions of Chapters 17, 18 and 19 shall apply.

A permit shall not be required for the removal of trees, shrubs, or landscape irrigation in public right-of-way by the owner of an abutting property, or by any municipality requiring such work by the owner of an abutting single family or duplex residence, provided that the Highway Construction and Engineering Division is properly notified in advance, in accordance with Section 3-3.3.1 of this chapter. The provisions of Chapters 17, 18 and 19, as applicable, shall govern the materials, installations and operation, except that irrigation record drawings and certifications shall not be required.

However, prior to beginning work it is the responsibility of the owner of the abutting

property to determine if a permit is required by the Environmental Protection Department or another governmental agency.

3-2.3 Emergency Work: None of the above permit procedures apply to emergency repair work in public right-of-way. Emergency repair work is defined as that which must be done immediately upon discovery, in order to safeguard the public from immediate danger to life or limb, to safeguard public health or welfare, or to restore interrupted utility services. In the event of such emergency, repair work may be started without a permit upon verbal notification being given to the Highway Construction and Engineering Division. If the Highway Construction and Engineering Division offices are closed, then notification shall be given as early as possible on the next regular work day. After the emergency repair is completed and the public right-of-way is restored, a record sketch shall be submitted to the Highway Construction and Engineering Division, unless otherwise provided hereinafter, within ten (10) working days. Work that can be scheduled ahead of time shall not be considered emergency work.

3-3 NOTICE REQUIRED

3-3.1 Preconstruction Meeting: Prior to starting any work in public right-of-way, the Engineer of Record, the utility owner, the permittee, and any other parties deemed necessary by the Highway Construction and Engineering Division, shall meet with the Public Works and Transportation Department to review the proposed work.

3-3.2 Start of Construction: The Highway Construction and Engineering Division requires forty-eight (48) hours notice prior to commencing any work in the public right-of-way.

3-3.3 Schedule for Inspection and/or Testing: For inspections and tests within public right-of-way, the Highway Construction and Engineering Division shall be notified at least twenty-four (24) hours in advance to schedule an inspector to the site.

The Engineer of Record for the project shall be present for all inspections and tests, unless instructed otherwise by the Highway Construction and Engineering Division.

3-4 FACILITIES IN PUBLIC RIGHT-OF-WAY

3-4.1 Ownership and Maintenance of Facilities: Except as otherwise approved by the Highway Construction and Engineering Division, all facilities to be installed within public right-of-way shall be owned and maintained by a public service utility or franchisee or by a political entity competent to function within the State of Florida, and shall remain the liability of the last operating entity until removed, unless the facilities are required to be left in place by the Highway Construction and Engineering Division.

3-4.2 Location of New Facilities: Where utility easements are available, utilities shall locate all poles, lines, vaults, conduit and other facilities within those easements. Placement of facilities in portions of public right-of-way, other than in

easements, shall only be considered as a least preferred option. For utility placement details, see Drawings 7, 8, 9 and 10 in Appendix A.

3-4.3 Abandoned Facilities: All exposed facilities and such underground facilities, as may be designated by the Highway Construction and Engineering Division, which are abandoned within public right-of-way, shall be removed by the owner of the facility unless other provision is approved by the Highway Construction and Engineering Division. Any abandoned facility allowed to remain in public right-of-way shall continue to be the responsibility of the owner or operator who last used the facility. Such owner or operator shall be liable for all costs arising from the presence of the abandoned facility in the public right-of-way. This section does not apply to facilities required to remain in place by the Highway Construction and Engineering Division.

3-4.4 Miscellaneous Facilities: Permit applications for all types of facilities or installations not specifically addressed in this document shall be reviewed according to standards established by the Director of the Highway Construction and Engineering Division on a case-by-case basis. Bus shelters placed in public right-of-way shall meet all applicable codes, and be approved by the Mass Transit Division and the Building Code Services Division (see Drawing 31 in Appendix A for Transit Accessory Pad Site Plan Required Information).

3-4.5 Underground Facilities: All underground and in-ground facilities in public right-of-way shall be designed and installed so as to safely sustain any vehicular and construction loads that might be placed upon them.

3-4.5.1 Muck Removal: Prior to placing any underground facility in public right-of-way, unless otherwise approved by the Highway Construction and Engineering Division, the permittee shall remove all muck and other deleterious material existing within the zone extending from the ground level to the horizontal plane four (4) feet below the facility's intended location and from the vertical plane four (4) feet beyond one (1) side of the facility's intended location to the vertical plane four (4) feet beyond the opposite side of facility's intended location. If so doing, based on the judgment of the Highway Construction and Engineering Division, would endanger an existing facility, permittee shall de-muck only that area which can be done without such endangerment.

3-4.5.2 Muck Removal for Direct Burial Cables or Conduits: The requirements of Section 3-4.5.1, above, shall not apply to direct burial cables or conduits for cables, but any cable or conduits for cables so placed shall be subject to the provisions of Section 3-4.5.3 below.

3-4.5.3 Facilities Placed Without De-mucking: Any facility placed without de-mucking shall be subject to abandonment or relocation by the operator of said facility in the event that de-mucking shall be done at a later date.

3-4.5.4 Underground Facilities in Areas to Be Paved: In all areas to be paved, permittee shall contact the maintaining agency for all underground facilities not yet in service. After the roadway base has been constructed but before the wearing course(s) have been placed, the maintaining agency shall test the facilities to make sure they are in proper operating condition. All damaged or defective portions of

such facilities shall then be replaced or repaired, and the roadway base restored by the maintaining agency. At that point, the facility shall again be tested to assure that it is in proper operating condition. This procedure shall be repeated until the facility is determined to be in proper operating condition, after which the wearing course(s) may be placed.

Tests required for this Section are as follows:

1. For pressure piping (refer to appropriate utility test requirements in this document), line service pressure shall be maintained for two (2) hours, with not more than a five (5) pound loss in pressure.
2. For gravity flow systems, exfiltration and visual inspection (lamping, etc.) shall suffice.
3. For sleeves and conduits, lamping or mandrelling shall be performed.
4. For other facilities, tests shall be as directed by the Highway Construction and Engineering Division.

3-4.5.5 Underground Facility Crossings: Underground facility crossings of paved roads shall be made by the "bore and jack" method unless an alternate method is approved by the Highway Construction and Engineering Division. The minimum distance from the existing edge of pavement to a bore pit and/or a receiving pit shall be four (4) feet unless otherwise approved. Proposed open cuts shall be shown on the drawings submitted for approval to the Highway Construction and Engineering Division. An alternate method of road crossing may be considered if plans are submitted demonstrating the bore and jack method to be impractical. The permittee shall start the boring far enough from the edge of pavement as determined by the Highway Construction and Engineering Division to be able to obtain proper cover.

Missile boring shall not be permitted in public right-of-way without prior written approval by the Highway Construction and Engineering Division.

3-4.5.6 Extraction of Pipe from Bore: The extraction of pipe or conduit from beneath any roadway is prohibited without prior written approval by the Highway Construction and Engineering Division. Where approved, the right-of-way shall be trenched and later restored in accordance with Drawings 11, 12, 13 and 14 in Appendix A.

3-4.5.7 Relocation of existing facilities: Relocation of any existing utility must be approved by the Highway Construction and Engineering Division.

3-4.6 Detection Aids: All underground facility installations shall include approved detection aids for later determination of location without excavation.

3-4.6.1 Potting holes to locate underground facility installations shall be allowed with prior written approval of the Highway Construction and Engineering Division. Such holes shall be backfilled, compacted and restored in such a manner that all suitable material removed during excavation is replaced in the hole.

3-5 TRAFFIC ENGINEERING

3-5.1 Standards and Specifications: Prior to commencing any work within public right-of-way, the Engineer of Record, the permittee and all Subcontractors shall comply with Broward County "Traffic Engineering Standards and Specifications."

3-6 CONSTRUCTION

3-6.1 Availability of Plans, Permit and MOT Plan: A set of plans for the project bearing the Highway Construction and Engineering Division approval stamp, the Permit issued by the Highway Construction and Engineering Division, and the MOT plan approved by the Traffic Engineering Division, shall all be onsite whenever work is in progress. In the event that any one of these items is not so located, work shall not be allowed to begin or, if already begun, shall be halted.

3-6.2 Start of Construction: Prior to the start of construction the permittee shall notify the Highway Construction and Engineering Division whether or not all work to be done "by others" has been completed, or has been scheduled to be completed during a specific phase of construction.

3-6.3 Supervision of Construction: The permittee shall keep sufficient competent supervision onsite while work is in progress to ensure that the work is being performed properly and in a safe and orderly manner. The supervisor shall be authorized to receive and implement notices regarding the installation, working procedures and/or job-site safety from a representative of, or from the Engineer of Record, or in their absence, from the County Inspector. The supervisor shall ensure that everyone within fifteen (15) feet of a work area wears a safety vest. The permittee is responsible for overall site safety and for the safety of all activities of any subcontractor who performs work in public right-of-way under the permit.

3-6.4 Interruption and Restoration of Services: Adequate provision shall be made for the safe, continuous operation of any facilities encountered during construction, unless other approved arrangements have been made. The maintaining agencies of all such services and all structures altered or damaged during construction shall be notified immediately, and all such services and structures shall be satisfactorily restored unless otherwise approved.

3-6.5 Removal of Pavement, Drives, Sidewalks, Curbs and Gutters: Edges of concrete or asphaltic pavement shall be pre-cut straight, clean, smooth and square beyond any damaged base area including well point locations. Utility cuts in existing pavements shall be restored as indicated on Drawings 11 through 16 in Appendix A. When the removal of sidewalks, curbs or gutters is necessary for construction, they shall be removed in full sections or a minimum of five (5) feet in length, and all broken edges cut straight, clean and smooth by appropriate means. If the road pavement is damaged during such removal, it shall be repaired in accordance with Chapter 5, Section 5-6.

The restoration of pavement at a maintenance access structure shall be in accordance with Drawing 13 in Appendix A.

3-6.6 Excavation

3-6.6.1 Bracing and Shoring: Sheet piling, bracing, etc., shall be used as required to support the sides of the excavation and to prevent any movements which can in any way alter the grade of or injure the facility being installed, diminish the width of excavation or otherwise injure or delay the work or endanger personnel, adjacent pavements or other structures. Safety procedures shall be followed and adequate protection shall be furnished to all personnel as required by OSHA and State Statute. All sheet piling or bracing which is not left in place shall be removed in a manner that shall not endanger the work, personnel or adjacent structures. To prevent trench undermining proper trenching methods and equipment shall be used, and all personnel and equipment shall be kept at a safe distance.

3-6.6.2 Disposal of Excavated Materials: Broken pavement and other debris shall be removed from the site as soon as practical, unless otherwise directed by the Highway Construction and Engineering Division. Excavated materials may not be stockpiled in public right-of-way during construction without specific approval of the Highway Construction and Engineering Division. All excess materials shall be removed from the work-site and disposed of legally by, and at the expense of, the permittee.

3-6.6.3 Disposal of Water from Excavation: Adequate provision shall be made for the satisfactory disposal of water resulting from de-watering or pumping operations or from encounter with water in any manner. The method of handling or disposing of such water shall be in accordance with applicable regulations of all agencies having jurisdiction including, but not limited to, the State Health Department, State Department of Environmental Protection and the Broward County Environmental Protection Department.

3-6.7 Backfilling and Compaction

3-6.7.1 Field Density Tests: All field density tests shall be made in accordance with ASTM Standard D5195 using Surface Moisture-Density Gauges, unless otherwise approved. If the first two (2) densities taken during a density test fail, the test shall be rescheduled.

3-6.7.2 Embankments: All material shall be granular, and well-graded, and shall have a minimum Load Bearing Rating (LBR) of 40. All stripped asphalt and vegetation shall be removed from backfill material. With the approval of the Highway Construction and Engineering Division, rocks that are removed may be crushed and used as backfill. Material of FDOT Class A-5, A-7, or A-8 shall not be allowed.

Backfill material shall be placed in layers not to exceed eight (8) inches in thickness, with each layer carefully compacted to 100% of maximum density, per AASHTO T-99-C, and tested by the permittee, under the supervision of the Highway Construction and Engineering Division, before placing succeeding layers. Swale areas need only be compacted to 95% of maximum density, per AASHTO T-99-C. Density tests shall be taken by the permittee, in each lane and shoulders at intervals of five-hundred (500) feet or less, as directed by the Highway Construction and Engineering Division representative.

3-6.7.3 Pits and Trenches: After a structure, cable, conduit or pipe is acceptably installed, tested and approved; backfilling shall be done with approved material.

In dry trenches, backfill material shall be placed evenly and carefully around and over the pipe in twelve (12) inch maximum layers, each layer being thoroughly compacted, until one (1) foot of cover exists above the crown of the pipe. The remaining trench portion up to the pavement base shall be backfilled in layers not exceeding eight (8) inches, with each layer being compacted and tested at intervals of one-hundred (100) feet, with 100% maximum density, per AASHTO T-99-C, before placing succeeding layers.

Unpaved areas shall be compacted to 95% of maximum density, per AASHTO T-99-C, and testing shall be at the County Inspector's discretion which shall include consideration of the following criteria in determining the nature and frequency of testing: proximity to pavement, depth of cut, nature of soil, elevation of ground water, previous test results, length of trench, type of compaction equipment used, and such other relevant factors as may exist at the site. All materials shall be able to pass through a six (6) inch ring. Use of wash rock shall not cause settlement due to sand filling the voids.

Laboratory testing for the optimum moisture and maximum soil density shall conform to the specifications of AASHTO T-99-C (Standard Proctor). Restoration of the roadway shall be in accordance with Drawings 11, 12, 13 and 14 in Appendix A.

At the permittee's option, with the approval of the Engineer of Record, and with the County Inspector's approval, after the compacted backfill has reached the centerline of the newly installed pipe or conduit, the remaining trench backfill may be placed to one (1) foot above the ground water level without interim compaction, provided that the water is allowed to rise in the trench to its natural level and then be pumped down to the pipe invert, at least twice. The balance of the trench backfill shall then be placed and compacted as described for dry trenches.

3-6.8 Restoration of Public Right-of-Way

3-6.8.1 Work Area Restoration: The entire work area utilized for the performance of any permitted work shall be restored by the permittee to meet current standards for new construction, as set forth in these Minimum Standards, except as required by the nature of the permitted work or as directed by the County Inspector or as otherwise provided hereinafter.

3-6.8.2 Paved Areas: Paved sections shall conform in type, shape, elevation and texture with adjacent paved areas and shall be of at least equal quality. Design mixes for flexible pavements shall be subject to approval by the Highway Construction and Engineering Division. All areas of new or existing pavement, damaged or undermined in the course of permittee operations, shall be removed and restored as set forth herein. Where pavement is removed for installation, maintenance or removal of any underground facility, restoration shall be in accordance with Drawings 11, 12, 13 and 14 in Appendix A.

Equipment shall not travel over loose rock fragments or other hard material lying

on sections of pavement which are not to be removed. When pavement is to receive an asphalt overlay, the County Inspector may require the installation of a leveling course in order to eliminate irregularities and unevenness in the existing pavement surface.

3-6.8.3 Swale Areas, Medians, Sidewalks, Driveways: Swale areas, medians, sidewalks, driveways, etc., and all other existing facilities shall be restored in kind in accordance with the provisions of 3-6.8.1 of this Chapter, except that driveway restoration materials shall be limited in kind to plain concrete or asphalt.

For sidewalk details see Drawings 14, 15 and 16 in Appendix A.

Swales or retention areas adjacent to sidewalks shall be graded and sodded immediately so as to avoid undermining of the sidewalk.

3-6.8.4 Benchmarks and Survey Markers: All benchmarks and permanent reference survey markers are to be protected at all times. If a benchmark or permanent reference survey marker is disturbed, or covered by pavement or sidewalk during the course of construction it shall be replaced or raised at an equal or better level of precision, at the permittee's expense, by a Professional Surveyor and Mapper registered in the State of Florida. All such disturbances shall be reported to the County Surveyor immediately.

3-6.9 Restoration of Signs and Pavement Markings: Any signs or pavement markings that have been damaged or destroyed shall be repaired or replaced in accordance with Traffic Engineering Standards and Specifications.

3-7 INSPECTIONS, TESTS, VIOLATIONS AND CERTIFICATIONS

3-7.1 Right of Entry: Personnel of the Public Works and Transportation Department shall have the right to enter any work-site to inspect or test material and/or workmanship on projects for which a Highway Construction and Engineering Division permit to construct has been, or should have been obtained from the Highway Construction and Engineering Division, or which is to be constructed in accordance with Broward County's "Minimum Standards."

3-7.2 Inspections and Tests: All inspections and tests necessary to ensure construction conformity with the plans and specifications as approved by the Public Works and Transportation Department shall be made by or under the direct supervision, of the Engineer of Record, or an authorized representative of the Engineer of Record.

The Highway Construction and Engineering Division shall perform such inspections and shall require such tests as it deems appropriate to ensure proper installation, and shall witness all such tests.

No labor, material or equipment required for testing of facilities, shall be furnished by the Highway Construction and Engineering Division except as noted hereinafter. The permittee shall perform the tests(s) in the presence of the Engineer of Record and a Highway Construction and Engineering Division representative. If the Highway Construction and Engineering Division fail to witness a properly scheduled

test, the certification of the Engineer of Record shall only be accepted, as determined by the Highway Construction and Engineering Division.

3-7.2.1 Signals: Inspection of communication conduit/interconnect cable and signalization items shall be performed by the Traffic Engineering Division and the Engineer of Record. A written inspection request shall be provided by the Engineer of Record to the Traffic Engineering Division at least fourteen (14) days prior to the required date. This request may be FAXED to the Traffic Engineering Division.

3-7.2.2 Street Lights: Inspection of street lights shall also be performed by the maintaining agency, and the Engineer of Record. If the maintaining agency is the Traffic Engineering Division, a written inspection request shall be provided, by the permittee performing the street light work, to the Traffic Engineering Division at least fourteen (14) days prior to the required date. This request may be faxed to the Traffic Engineering Division.

3-7.2.3 Signs and Pavement Markings: Inspections of the signs and pavement markings shall be performed by the Traffic Engineering Division. A written inspection request shall be provided by the Engineer of Record. This request may be faxed to the Traffic Engineering Division. For details pertaining to signs and pavement markings see Drawings 26 and 27 in Appendix A.

3-7.2.4 School Flashers: Inspections of school flashers shall be performed by the Traffic Engineering Division. A written inspection request shall be provided by the permittee performing the work, to the Traffic Engineering Division at least seven (7) days prior to the required date. This request may be FAXED to the Traffic Engineering Division.

3-7.3 Violations: A permittee who violates a permit condition may be issued a "Notice of Violation," and if deemed necessary by the Highway Construction and Engineering Division, the job may be shut down immediately. If the violation is not of a serious nature, the permittee may be given a reasonable amount of time to remedy the situation. If the violation is not corrected before the end of the period, the job may be shut down.

If the permittee refuses to sign the "Notice of Violation," the Highway Construction and Engineering Division may shut the job down immediately.

3-7.4 Certifications: The Engineer of Record or it's representative shall carefully observe and/or inspect all portions of the permitted installation sufficiently to determine that the permittee has substantially complied with all approved plans and specifications related thereto, and the Engineer of Record shall so certify at the completion of the work.

3-8 RECORDS

3-8.1 Reports: Any reports relating to construction progress, tests or other matters which may be required by the Highway Construction and Engineering Division, the Broward County Health Department or the Engineer of Record shall be made available to the Highway Construction and Engineering Division upon request without charge.

3-8.2 Record Drawings: Except as hereinafter provided, upon completion of construction and prior to final inspection or commencement of any maintenance period for which security has been posted, the Engineer of Record or Landscape Architect shall furnish to the Highway Construction and Engineering Division, one (1) set of record drawings signed and sealed by a Professional Surveyor and Mapper certifying the as-built location dimensions and elevations shown thereon. The Engineer of Record shall then certify that the subject installation has been completed in substantial conformity with the approved plans and specifications and that he has reviewed and is satisfied with the Professional Surveyor and Mapper certified as-built information contained on the record drawings for the subject installation. Special requirements for various types of installations are detailed in the Chapters that follow.

3-8.2.1 Submission of CAD Drawings: When the design drawings have been produced using a Computer Assisted Design (CAD) system, the "as-built" of record drawings shall also be produced on the CAD system and the Engineer of Record shall also submit a copy of the storage medium containing the information from which the as-built drawings were produced.

3-9 REVIEW OR REVISION OF COUNTY STANDARDS: Any request for review or revision of these Standards shall be made to the Director of the Highway Construction and Engineering Division in writing, stating the item to be considered and setting forth the objections and suggestions for revision. The Director shall respond in writing as soon as possible thereafter, but in any event, within sixty (60) days after receipt of such request.

3-10 NOTIFICATION OF COMPLETION: The permittee shall notify the Highway Construction and Engineering Division immediately upon completion of the permitted work. The permittee shall notify the Highway Construction and Engineering Division if it becomes known that the start of the work shall be unduly delayed, or if the work shall not be done.

3-11 DIRECTOR'S DISCRETIONARY AUTHORITY: The Director of the Highway Construction and Engineering Division shall have the authority, and sole discretion, to modify, add to or waive any provisions in this document if, in the Director's professional opinion, the circumstances of any given situation so warrant.

CHAPTER 4 – PERMITS, FEES AND SECURITY

4-1 PROCEDURE FOR OBTAINING A PERMIT

4-1.1 Construction Drawing Review: Prior to application for permit, a minimum of seven (7) complete sets of construction drawings for the proposed work, signed and sealed by an Engineer, registered in the State of Florida, shall be submitted to the Highway Construction and Engineering Division for review and approval. The submittal shall include a completed plan review application form, a survey (which accurately reflects current field conditions), signed and sealed by a Professional Surveyor and Mapper, registered in the State of Florida and a signed and sealed Estimated Cost of Improvements Form that clearly distinguishes the work to be performed in public right-of-way from work to be performed outside public right-of-way, unless otherwise specified hereinafter. Plans involving only landscape work may be signed, sealed, and submitted by a Landscape Architect, registered in the State of Florida.

Prior to application for permit, the Engineer of Record is responsible to verify that project design is based upon the latest "Minimum Standards."

4-1.2 Obtaining Plan Review Forms: The applications for plan review, as well as other necessary forms, are available at the Highway Construction and Engineering Division office.

The plans, together with all required forms, and any required review fees should be submitted to:

Highway Construction and Engineering Division
1 N University Drive, Suite 300
Plantation, FL 33324-2038

If you have any questions call the Highway Construction and Engineering Division.

4-1.3 Plan Approval: Plan review is normally completed within two (2) weeks. Upon completion of the review, the owner and the Engineer of Record/Landscape Architect shall be advised, in writing, whether the plans were approved. If the plans were not approved, the letter shall advise what items need to be submitted or revised. If necessary, one (1) copy of each drawing, noting all required revisions, shall be returned to the entity indicated on the application, with an explanatory letter. One (1) set of approved drawings with an approval letter shall be returned to the Engineer entity indicated on application. When the drawings are approved, application shall be made for a permit to construct.

Construction drawing approvals shall be void after one (1) year unless the Highway Construction and Engineering Division permit to construct the approved facilities is in effect. For large, phased projects, the Highway Construction and Engineering Division shall consider a request for a one (1) year extension of approval.

4-1.4 Maintenance of Traffic (MOT) Plan: Once the drawings are approved, application for a permit to construct may be made. When required, a MOT plan shall

be submitted to the Traffic Engineering Division for approval. The plan shall be in accordance with FDOT "Design Standards," Index 600 series. Construction may not commence until Traffic Engineering Division approval has been obtained.

4-1.5 Changes in Applicable Standards, Regulations or Laws: In the event that applicable standards, regulations or laws change subsequent to construction drawing approval, but prior to permit issuance, revised plans shall be submitted for approval under the new requirements.

4-1.6 Documents Required for Permit Issuance: The following items need to be provided to the Highway Construction and Engineering Division before a permit can be issued:

- A cost estimate as described in Chapter 4, Section 4-1.1
- A check in an amount in accordance with Chapter 4, Section 4-3.1, payable to the "Broward County Highway Construction and Engineering Division"
- Approval of the Florida Department of Health and/or the Broward County Environmental Protection Department, as applicable and approval of all other agencies having jurisdiction
- A copy of permittee's license, appropriate for the type of work to be done
- Required security amount in a form acceptable to Broward County
- A Copy of permittee's liability insurance coverage

Once all the necessary documents are in order they should be submitted to the Highway Construction and Engineering Division at:

Highway Construction and Engineering Division
1 N University Drive, Suite 300
Plantation, FL 33324-2038

4-1.7 Permit Issuance: Permit review is normally completed within one (1) week. Upon completion of the review, a permit (signed and dated by the issuing agent for the County) together with a stamped copy of the approved construction plans, shall be mailed to the permittee. Or the permittee may request to be called when the permit is ready so that it can be picked up. If the permit submittal is incomplete or in error, the permittee shall be advised of what items need to be submitted or revised. The application, when signed and dated by the issuing agency for the County, shall constitute the Permit to Construct.

Note: The Traffic Engineering Division shall not approve the MOT plan unless a permit has been issued, and the permit number has been given to them. If you have questions about MOT plan requirements call the Traffic Engineering Division.

4-1.8 Start of Construction: Permits shall be issued for work in public right-of-way only after all required plans have been approved, the required fees have been paid, and the required Performance and Maintenance security has been posted. Construction shall not commence within any public right-of-way until the applicant has obtained all necessary permits and approvals, including MOT plan approval, and

has received approval to commence work from the Highway Construction and Engineering Division Inspection section at least forty-eight (48) hours in advance of the actual start of construction.

Additionally, unless otherwise authorized by the Highway Construction and Engineering Division, a pre-construction meeting shall be required before any work may begin.

4-1.9 Incorrect, Misleading or Omitted Information: Plan approval is based primarily upon the information contained thereon. Evidence of incorrect, misleading or omitted information having significant bearing on the approvability of a previously approved plan shall be cause for rescission of the Highway Construction and Engineering Division approval, permit suspension, cessation of work (if started), and resubmittal of the corrected plans for approval. Subsequent minor revisions may be indicated upon approved prints, but such changes shall be signed and dated by representatives of the Engineer of Record and the Highway Construction and Engineering Division, prior to the permittee proceeding with the revision.

4-1.10 Construction Requirements: County plan approvals and permits notwithstanding, all installations in public right-of-way shall meet or exceed the requirements of FDOT "Green Book" and this document.

4-1.11 Drawings: Traffic Engineering Division Approval: Drawings detailing any signal modification or installation, interconnect plans, school flasher plans, or signing and pavement markings plans shall have the written approval of the Traffic Engineering Division prior to the issuance of the Permit to Construct

4-2 PERMIT EXPIRATION

4-2.1 Date of Issuance: Paving and Drainage permits shall become invalid one hundred and eighty (180) calendar days from date of issuance if work has not begun on a permitted project, unless other provisions have been made with the Highway Construction and Engineering Division.

Water and Sewer permits shall become invalid one hundred and twenty (120) days from date of issuance if work has not begun on a permitted project, unless other provisions have been made with the Highway Construction and Engineering Division.

4-2.2 Suspension of Work: Permits shall become invalid upon suspension of work in excess of 90 days on any permitted work, unless an extension has been granted by the Highway Construction and Engineering Division.

4-2.3 Completion of Work: Permits shall expire upon completion of the permitted work and approval and acceptance of the installation (including restoration of public right-of-way) by the permittee, all regulatory agencies involved, and the Highway Construction Engineering Division.

4-2.4 *Permit Expiration:* All permits shall expire two (2) years from date of issuance unless an extension is granted by the Highway Construction and Engineering Division.

4-2.5 *Resumption of Work after Permit Expiration:* Once a permit has expired, before any work may continue, begin or resume, a new permit shall be obtained with all current conditions and regulations having to be met including new plan approval. A new permit fee shall be charged for the uncompleted portion only.

4-3 FEES AND SECURITY

4-3.1 *Applicable Charges:* The Construction Permit fee, performance and maintenance security and any other applicable charges, when required shall be determined by the Highway Construction and Engineering Division. Fee and security amounts shall be based upon rates and conditions as approved by the Board of County Commissioners, and upon the work to be permitted including public right-of-way restoration, as determined by the Highway Construction and Engineering Division. Re-inspection and retesting fees, payable at time of rescheduling, shall be based upon rates and conditions as approved by the Board of County Commissioners.

4-3.2 *Form of Payment:* Permit fees and other applicable fees and charges may be paid in the form of cash or check. Checks shall be made payable to the "Broward County Highway Construction and Engineering Division."

4-3.3 Re-Inspection and Retesting Fees

4-3.3.1 *Re-inspection / Retesting Fees:* A re-inspection and/or retesting fee shall be charged each time an inspector of the Public Works and Transportation Department must visit any job-site to re-inspect and retest any installation or portion thereof that has failed to meet County requirements on a previous test or scheduled inspection. Re-inspection and retesting fees, payable at time of scheduling, shall be based upon rates and conditions as approved by the Board of County Commissioners. All fees shall be paid prior to re-scheduling.

4-3.3.2 *Notice of Cancellation:* Notice of cancellation of any test(s) or scheduled inspection(s) shall be given at least four (4) working hours, prior to the scheduled time. Failure to do so shall result in the test or inspection being counted as a failure, and a re-test or re-inspection fee shall be charged when the test is rescheduled.

4-3.4 *Work Performed by a Municipality:* No fee shall be payable by any municipality seeking permission to perform work in public right-of-way normally performed by the County as part of County's own jurisdictional responsibility. Prior approval to perform this work shall be obtained from the Highway Construction and Engineering Division.

This provision shall apply when such work is performed by municipal employees or by a permittee operating under a contract with the municipality. All such work shall be performed in accordance with these rules and regulations.

4-3.5 Performance and Maintenance Security: Performance and Maintenance Security may be posted in the form of cash, Certified Checks, or Letters of Credit. Letters of Credit shall be irrevocable and shall indemnify the Broward County Board of County Commissioners against costs of restoring or maintaining public right-of-way due to or arising from failure of the permittee to properly complete the work, to pay fully for labor, material or equipment supplied for the project, or for a failure in public right-of-way related to the permitted installation; for a period of one (1) year after the permitted work and all required documentation has been completed, approved and accepted by the Highway Construction and Engineering Division. The Letter of Credit form must be acceptable to the Broward County Attorney's Office. Notice of impending cancellation, revocation or non-renewal shall be given to the designated County Official(s) at least thirty (30) days prior to such event.

In the event of a failure in public right-of-way related to the permitted work, the warrantor shall promptly effect such repairs as are required by the Public Works and Transportation Department, and the warranty period on these repairs shall be extended for a period of one (1) year from the date of acceptance by the Public Works and Transportation Department of such repairs.

CHAPTER 5 – PAVING AND DRAINAGE - GENERAL REQUIREMENTS

5-1 PERMITS: Permits for construction, modification or maintenance of roadways, sidewalks, drainage or related facilities shall be issued only after the following requirements have been met:

5-1.1 Paving and Drainage Plan Review: Paving and Drainage plans shall have been reviewed and approved by the Highway Construction and Engineering Division prior to submittal of an application for permit.

5-1.2 Chapter 4 Provisions: The provisions of Chapter 4 of this document apply.

5-2 PERMIT FEES AND SECURITY

5-2.1 Fees and Security Charges: Fees and Security shall be charged in accordance with the provisions of Chapter 4, Section 4-3 except as provided in Section 5-2.2 below.

5-2.2 Security for Residential Driveway Connection: No Security shall be required for residential driveway connections under the following conditions:

1. Work is to be done by the owner or Contractor for the owner of abutting property
2. Permit application is for one (1) single-family or duplex residence
3. Permit is for a single eighteen (18) foot maximum width driveway only, not requiring additional drainage facilities, or sidewalk installation or restoration

5-2.3 Re-inspection and Re-testing Fees: The provisions of Chapter 4, Section 4-3.3 shall apply.

5-3 PLANS AND SPECIFICATIONS

5-3.1 Plan Submittal Requirements: All plans shall be submitted on white prints with blue or black lines. In addition to the proposed project they shall show all existing facilities as well as all other proposed facilities, including bus stops and related facilities, sufficiently to permit assessment of the compatibility of the proposed work and the existing systems. All plans submitted to the Highway Construction and Engineering Division pursuant to Section 5-1.1 of this Chapter shall meet the following requirements, except as provided in Section 5-3.13 of this document. The provisions of Chapter 3, Section 3-1.3 shall apply.

5-3.2 Sheet Size: Plans shall be submitted on 24" x 36" sheets except that, for small projects, plans may be submitted on legal size paper, provided that scale requirements are met and only one (1) sheet is required.

5-3.3 Plan Layout: General area layouts shall be prepared at a scale of three-hundred (300) feet or less to the inch. Detailed plans shall be prepared at a scale of twenty (20) feet or less to the inch except for local subdivision roads outside of the trafficway corridor which may be prepared at a scale of forty (40) feet or less to the

inch. Design drawings for arterial and collector roads shall include both plans and profiles. Design drawings for local roads need not include roadway profiles if sufficient elevations are provided. When profiles are drawn, they shall be to the same horizontal scale as the plan. All elevations shall be based on the National Geodetic Vertical Datum (NGVD). All roadway design plans shall show sufficient roadway geometry to determine proper design / construction aspects of the project.

5-3.4 Abutting Subdivisions: The names and boundaries of all abutting subdivisions shall be shown, giving the plat book and page number of the recordation.

5-3.5 Non-platted Areas: Areas not platted shall be shown as acreage, and the Section, Township and Range shall be noted.

5-3.6 Right-of-Way Dimensions: Dimensions of public right-of-way shall be indicated.

5-3.7 Legends: All plans shall show suitable legends.

5-3.8 Street Identification: All streets shall be identified.

5-3.9 Proposed Pavement: Proposed pavement shall be clearly indicated on the drawings and shall be dimensionally located within public right-of-way.

5-3.10 Utilities: All existing and proposed utilities in public right-of-way shall be shown on the paving, grading and drainage plans. All utilities shall be identified and located by dimension, horizontally and by elevation, and their materials of construction shall be noted to the extent determinable without excavation. All existing utilities that have been abandoned, but are still in the ground, shall be shown on the plans and labeled "abandoned."

5-3.11 Cross-sections and Typical Sections: Cross-sections and/or typical sections of proposed road and drainage construction, shall show dimensions, materials and purposes of all existing facilities as well as all proposed facilities within public right-of-way.

5-3.12 Title Sheet: The title sheet shall bear the following note and shall be signed and sealed by the Engineer of Record: The public roadways indicated these plans have been designed in accordance with FDOT "Design Standards."

5-3.13 Maintenance of Traffic Plan: A Maintenance of Traffic Plan, submitted by applicant and approved by the Traffic Engineering Division, is required prior to the commencement of construction in any public right-of-way.

5-3.14 Residential Driveway Connections: Plans for residential driveway connections, meeting the conditions of Section 5-2.2 of this Chapter, may be submitted on legal size paper provided that scale requirements are met and only one (1) sheet is required. Such plans need not be signed or sealed by a P.E. and need not indicate the locations of existing underground facilities.

5-3.14.1 Permit Required: Prior to construction of a residential driveway adjacent to County right-of-way, a "Driveway Permit" shall be obtained from the Highway Construction and Engineering Division. To obtain the permit the following items shall be submitted for approval: A properly completed "Application for Permit for Construction in the Public Right-of-Way" signed by the qualifier; and, three (3) legal size copies of a survey (that accurately reflects current field conditions) and clearly shows the work to be done.

5-3.14.2 Parking Spaces: Residential homes adjacent to Public Right-of-Way shall provide for a minimum of two (2) parking spaces. This requirement may be met by any combination of garage parking or driveway parking, all of which shall be on private property.

5-3.14.3 Driveway Width: The width of the driveway may not be greater than thirty (30) percent frontage. Therefore, for example, the maximum driveway width for a property with sixty (60) feet of frontage is eighteen (18) feet. To place a circular driveway on property with sixty (60) feet of frontage would require that the driveway width be limited to nine (9) feet.

An exception to limitation on driveway width may be permitted when there is positive drainage (drainage inlets) within three hundred (300) feet of the property, subject to approval by the Highway Construction and Engineering Division.

5-3.14.4 Material: Only brushed concrete may be installed by homeowners who do the work themselves. Stamped concrete, paver blocks and asphalt may only be installed by a contractor licensed to do such work in Broward County. Brick pavers are not permitted on arterial and collector roads.

5-3.14.5 Specifications: Concrete driveways shall be a minimum of six (6) inches in thickness, have a strength of 3000 p.s.i., and have no steel or mesh reinforcement for the portion of the driveway in County right-of-way. Also, regardless of material used, the driveway should be sloped away from the roadway, and a three (3) inch dip should be placed near the center of the swale. Base material shall be compacted to 98% of maximum density, per AASTHO T-180 (see Drawings 14, 15 and 16 in Appendix A).

5-3.14.6 Security Requirements: See Chapter 5, Section 5-2.2 for security requirements.

5-3.14.7 Swale Irrigation: See Chapter 17, Section 17-2.2 for swale irrigation requirements.

5-3.14.8 Driveway on Property Side of Right-of-Way: A separate permit is required for construction of the portion of the driveway on the property side of the right-of-way line, and is subject to Broward County Building Department requirements.

5-4 CONFLICT STRUCTURES: All Conflict maintenance access structures shall have approval of the appropriate State and County reviewing agencies before being permitted by the Highway Construction and Engineering Division, and shall conform to the requirements of Chapter 10, Section 10-9, and Drawing 21 in Appendix A of

these standards. This shall apply to field changes as well as conflict structures proposed in the design of the project in question.

5-5 SLEEVING: Unless otherwise approved, sleeving shall be provided for all future utility crossings, to the extent that needs can reasonably be anticipated, in order to minimize cutting and patching of new pavement. Size, material and purpose of the sleeve shall be indicated on the plans. All sleeves shall be ductile iron or steel pipe.

High density polyethylene (HDPE) sleeving may not be used without prior approval by the Highway Construction and Engineering Division.

5-6 RESTORATION OF PAVEMENT: Wherever curb removal or installation, utility or drainage installation or removal, or other construction disturbs existing pavement, that pavement so influenced shall be restored by repair/ replacement to full lane width.

Wherever pavement is damaged by construction equipment or its operation, that pavement so influenced shall be repaired/replaced to full lane width.

Diagonal patching is not allowed without prior approval by the Highway Construction and Engineering Division.

CHAPTER 6 – ARTERIAL AND COLLECTOR ROADS - TECHNICAL REQUIREMENTS

6-1 ROADWAYS

6-1.1 Minimum Design Criteria: As a minimum, roads designated as arterial or collector roads and related facilities shall be designed in substantial accordance with the: "The Green Book," "Design Standards," and the "Utility Accommodation Guide Manual," all as published by FDOT; "The Land Development Code," Chapter 5, Article IX of the "Broward County Code of Ordinances," EPD's "Code of Regulations," Chapter 27, Section 406e "Design Criteria," Sub-Section 1.C.3 entitled "Flood Protection" and the provisions of the "Americans With Disabilities Act."

6-1.2 Construction Criteria: Construction materials and methods shall meet the requirements of FDOT "Standard Specifications for Road and Bridge Construction" and supplements, except as modified herein, by EPD's "Code of Regulations," Chapter 27, Section 406e and by the provisions of Chapter 3 of this document. All materials shall be new and unused.

6-1.2.1 Temporary Facilities: Temporary facilities, unrelated to any ongoing construction in public right-of-way, and intended to provide an essential service for a period of time not to exceed one (1) year, may be constructed in public right-of-way, contingent upon Highway Construction and Engineering Division approval of project plans and specifications, and issuance of a Highway Construction and Engineering Division Construction Permit.

6-1.2.2 Temporary Facilities Constructed to Provide or Maintain an Essential Feature: In cases where temporary facilities must be constructed to provide or maintain an essential feature around portions of a public right-of-way for public safety or convenience during construction, such temporary facility shall be clearly drawn in sufficient detail on standard size drafting sheets, and submitted to the Highway Construction and Engineering Division for review and approval prior to implementation.

6-1.3 Typical Sections: A typical section shall be shown on all plans. For submittal of a new roadway or new through lanes, the applicant shall submit sketches of the proposed typical right-of-way sections to the Highway Construction and Engineering Division for approval prior to beginning the preparation of plans. Proposed typical right-of-way cross sections shall follow the format and general provisions shown in Drawings 1 through 6 in Appendix A. The Highway Construction and Engineering Division may require submittal of a traffic study that evaluates the anticipated traffic volume and the capacity of the new roadway based on Florida Department of Transportation standards.

The typical sections shall show or note all of the applicable design elements outlined in the "Green Book." Where determination of the "ultimate through lane" is necessary, it shall be made in this review.

6-1.4 Minimum Safety Criteria: The minimum safety criteria for design of roads and streets in Broward County shall meet or exceed all standards referenced in Sections 6-1.1 and 6-1.2 of this Chapter.

6-1.5 Guardrail: The following policy is to be implemented in the design of all roadway construction involving lakes and canals when it is necessary for such waterways to exist adjacent and parallel to the roadway.

For the purpose of this policy, a canal/lake is defined as a constructed or natural water body having a bottom elevation lower than one (1) foot below the control elevation of the area. The top of bank of any lake or canal shall be at least one (1) foot above the control elevation.

6-1.5.1 Minimum Distance to Canal: The distance from the outside edge of the ultimate through travel lane to the top of the lake/canal ultimate side slope (top of bank) nearest the road shall be no less than sixty (60) feet for highways with design speeds of 50 mph or greater. For highways with design speeds less than 50 mph, this minimum distance may be reduced to fifty (50) feet for rural highways or forty (40) feet for urban (curb and gutter) highways. When a new lake/canal or roadway alignment is required, (at less than the ultimate cross-section), distances greater than those above should be provided, if possible, to accommodate possible future improvements to the roadway (widening, etc.).

6-1.5.2 Installation of Protection: Installation of guardrail, or other approved protective devices, is required throughout all areas where it is impossible to meet the above minimum criteria. For canals located on the outside of curves sharper than two (2) degrees, greater offset widths or construction of guardrail is required (see FDOT "Design Standards").

When guardrail is required for canal protection, it should normally be placed at or near the edge of the clear recovery area. The distance from the outside edge of the shoulder to the face of guardrail should, in all cases, be greater than twelve (12) feet when guardrail is not constructed at the edge of the shoulder. The roadway front slope back of guardrail may be steepened to a slope of 2:1.

A continuous strip of asphalt four (4) inches thick and three (3) feet minimum width, centered on the guardrail, shall be placed at all new guardrail installations in unpaved areas.

6-1.5.3 Installation of Guardrail at Existing Bus Stop: At all existing bus stop locations, where guardrail is proposed to be installed, openings shall be provided in the guardrail at appropriate points for passenger access. If so doing would create a hazardous condition, the bus stop should be relocated instead

6-1.5.4 Objects Unprotected by Guardrail: All objects within public right-of-way that are not protected by guardrail shall be of "breakaway" design.

6-1.6 Subgrade: The entire width of public right-of-way shall be demucked before construction of the roadbed begins. No material of FDOT Class A-5, A-7 or A-8 shall be allowed. All material supporting the roadway and shoulders shall have a minimum Load Bearing Ratio (LBR) of forty (40). The top twelve (12) inches of the

undisturbed soil shall be compacted to 100% of maximum dry density as per AASHTO T-99-C. Subgrade shall be checked for conformance with approved plans.

6-1.7 Bases

6-1.7.1 Material: Limerock of the Miami formation shall be used, having a minimum percentage of carbonates of calcium and magnesium of 70%, and a minimum LBR of 100. Limerock bases shall be constructed in lifts not to exceed six (6) inches. The finished surface of all roadway bases shall be tested by "boarding" or by other approved method, and shall show no deviation from the required elevation greater than one-quarter (1/4) inch in any fourteen (14) foot segment. Base material shall be compacted to a density of not less than 98% of maximum dry density as determined by AASHTO T-180.

6-1.7.2 Alternative Base Materials: The permittee may propose alternate base materials for use in lieu of limerock. Such proposal shall be submitted to the Highway Construction and Engineering Division, whose approval for the substitution shall be obtained before the proposed material may be incorporated into the project.

6-1.7.3 Start of Base Course Construction: The requirements of Chapter 3, Section 3-4.5.4 apply.

6-1.8 Wearing (Surface) Courses: A tack coat shall be used between paving courses, and a prime coat shall be used on the finished rock base. Only virgin materials may be used in wearing courses, unless otherwise approved, in writing, by the Highway Construction and Engineering Division.

6-1.8.1 Surface Course Construction: See Drawing 6, Sheet 2 of 2 in Appendix A for surface course construction requirements.

Recycled asphalt used in the road mix shall not exceed 10%.

6-1.8.2 Asphaltic Concrete Aggregate: Miami Oolite only shall be utilized as an asphaltic concrete aggregate.

6-1.8.3 Wearing Course: Wearing courses shall not be placed until the following has occurred:

1. A walk through has been conducted to determine if there is any remaining work that might cause damage to the final lift.
2. All landscape work that might cause damage to the final lift is complete.
3. All construction equipment has been inspected for leaks of fluids that may blemish or damage the final lift. This equipment shall be repaired, or removed from the job-site.
4. All underground utilities are installed and accepted, and a finished Rock Survey has been submitted to and accepted by the Highway Construction and Engineering Division.

6-1.8.4 Alternate Roadway Surfacing Materials: Alternate roadway surfacing materials such as concrete, brick pavers, stamped concrete, etc., shall be considered on a case by case basis. Brick pavers are not permitted on arterial and collector roads, unless otherwise approved by the Highway Construction and Engineering Division.

6-1.9 Shoulders: See Drawing 6, Sheet 2 of 2 in Appendix A for shoulder construction requirements.

All shoulders shall have a minimum width of eight (8) feet where conditions permit, but in any event, no less than six (6) feet. Where possible, a width of four (4) feet of the shoulder shall be paved as one-way bike lane. Where this area is needed for drainage, the outside lane shall be designed and constructed a minimum of two (2) feet wider than the interior lanes.

For unpaved shoulders, materials shall be stabilized to an LBR of at least 40.

For paved shoulders, pavement shall be one (1) inch minimum of Type S-III over an eight (8) inch compacted and primed limerock base. Limerock base shall be compacted to a minimum density of 98% of AASHTO T-99C.

6-1.10 Curb/Gutter: See Drawing 6, Sheet 2 of 2 in Appendix A for curb/gutter construction requirements. All type "F" curb elements shall be placed so that they are one-quarter (1/4) inch higher than adjacent inlet frames and grates. Concrete shall have a minimum twenty-eight (28) day strength of 3000 p.s.i.

Unless otherwise approved, all curb elements shall have a limerock foundation or "pad" with a minimum LBR of 100 and minimum carbonate content of 70%. Pads shall be at least four (4) inches thick, extending six (6) inches (min.) beyond the edges of the concrete compacted to 98% of maximum density, per AASHTO T-180. The use of other materials shall be considered on a case by case basis.

6-1.11 Traffic Separators: Traffic Separators, less than four (4) feet in width between face of curbs, shall be paved with a six (6) inch (minimum) thickness of concrete (refer to FDOT "Design Standards," Index 302).

6-1.12 Swales: Bottoms of swales, measured from top of turf, shall be at least six (6) inches below the edge of road pavement. Swales shall be compacted to 95% of maximum density, per AASHTO T-99-C, and seeded, mulched and fertilized, or sodded, if not paved. For typical sections through swales and sidewalk areas see Drawings 15 and 16 in Appendix A.

Where drainage is dependent upon percolation in the swale, sufficient testing shall be performed to verify the validity of the design assumptions and calculations, and the results shall be submitted, together with the design calculations and drawings, to the Highway Construction and Engineering Division for evaluation of the proposed system. If conditions so indicate, a positive drainage system shall be required.

When swale work is being performed, trucks that are blocking lanes should be parked on a side street whenever practical.

Upon completion of construction in the swale with the exception of final seeding or sodding, swale percolation shall be re-tested as directed by the Highway Construction and Engineering Division, to verify that the actual percolation is consistent with the design values. The results of these tests shall be submitted to the Highway Construction and Engineering Division prior to final inspection.

Where a designated bus stop exists or is planned in any public-right-of way, anyone developing, redeveloping or improving public right-of-way, except for the owner of a single one-family or duplex residence lot abutting such bus stop, shall provide an approved paved pedestrian access conforming with the provisions of the Americans with Disabilities Act for persons exiting or seeking to enter a bus. If such pedestrian access obstructs the flow of water in the swale, a culvert shall be provided to allow the water flow freely past the obstruction. The swale, in the vicinity of such paved access, shall be sloped up to the top of the paved access edge to avoid creation of a hazardous condition. At locations where guardrail exists, the guardrail shall be modified to provide the required access. Where guardrail is less than 600' in length, if access cannot be provided without creating a hazardous condition, the bus stop should be located elsewhere.

6-1.13 Drainage: All drainage facilities and systems within public right-of-way shall be designed and constructed in accordance with the requirements of the Environmental Protection Department, the Surface Water Management Division "Management of Surface Water Discharge and Non-Point Source Pollution" Regulations, Chapter 27, Section 405, and FDOT "Utility Accommodation Guide," except as modified herein, and with the provisions of Chapter 3 of this document.

6-1.13.1 Pipe: All drainage pipe installed under or within five (5) feet of existing or proposed paved areas (including curbs and sidewalks or bike paths) shall be reinforced concrete conforming to ASTM Specification C-76 or ASTM C-1450. Use of reinforced concrete pipe meeting ASTM C-1450 shall be approved on case by case basis. The use of high density polyethylene (HDPE) pipe is prohibited unless otherwise approved, in writing, by the Highway Construction and Engineering Division.

The minimum pipe size to be used shall be fifteen (15) inches in diameter.

All plugs in pipes, placed during construction, shall be removed prior to final inspection unless specifically approved to remain.

Pipes with spider cracks shall be rejected.

Filter fabric shall be placed over the tops of all pipe joints.

All drainage pipe in public right-of-way shall have a minimum cover as shown in FDOT "Design Standards," Index 205, but in no case less than twenty-four (24) inches unless otherwise approved by the Highway Construction and Engineering Division.

Concrete exfiltration pipe shall be laid such that slits are only at 3 o'clock and 9 o'clock.

Filter fabric in exfiltration trench shall have a minimum overlap of twelve (12) inches. All overlaps of filter fabric shall be on top and/or bottom of the trench. Overlaps on sides of exfiltration trench shall be avoided.

Exfiltration systems may not be placed under a roadway.

For drainage pipe installed in exfiltration trench refer to Drawings 17 and 18 in Appendix A.

Culverts in or crossing public right-of-way shall have a minimum of five (5) feet of cover unless otherwise approved by the Highway Construction and Engineering Division.

6-1.13.2 Slope Protection: Slope protection at outfalls and culvert ends shall be concrete revetment mats having a minimum thickness of four (4) inches, unless an alternate design is approved.

6-1.13.3 Structures: All drainage structures shall be of precast, reinforced concrete unless otherwise approved. All precast concrete structures shall meet the requirements of ASTM Standard No. C-478. Walls shall be not less than eight (8) inches thick and top and bottom slabs shall be not less than eight (8) inches thick.

Walls and floor slabs shall be fully doweled together and top slabs shall have an approved anchorage to prevent displacement. Walls shall extend a minimum of six (6) inches above the top of the highest pipe hole, three (3) inches minimum each side of each opening and, for inlets, twelve (12) inches minimum below the invert of the lowest pipe, unless otherwise approved. Concrete for drainage structures shall have a minimum compressive strength of 4000 p.s.i. at twenty-eight (28) days. All exposed brick shall be coated with one-half (½) inch, minimum thickness of cement mortar, and all voids around pipes and structures shall be grouted.

All concrete structures shall be delivered to the job-site bearing the stamp of an independent Florida certified Engineering Testing Laboratory, signed and dated by the laboratory's inspector unless certified by the manufacturer as meeting FDOT standards. These structures shall be un-patched and uncoated and shall remain so until approved by the Highway Construction and Engineering Division Inspector. For drainage structure details see Drawing 19 in Appendix A.

Maintenance access structures shall have a minimum dimension of four (4) feet between opposing walls.

Conflict Structures shall have not less than two (2) feet clearance between penetrating pipes and parallel concrete walls and shall measure not less than four (4) feet between other opposing walls. They shall have a minimum wall thickness of six (6) inches unless otherwise approved. For conflict structure details see Drawing 21 in Appendix A.

Type "C" Inlets are not permitted under paved areas, and are only permitted in swales.

Control structures shall have either two (2) standard access tops or one (1) in the center over the weir with a minimum opening of three (3) feet in accordance with FDOT "Design Standards," Index 201.

Concrete aprons, as approved by the Highway Construction and Engineering Division, shall be provided at all inlets in swales. Aprons shall extend three (3) feet from the inlet structure on all sides, except that on the side facing the road it shall extend to the edge of pavement. Aprons shall be a minimum of six (6) inches thick and shall have a minimum twenty-eight (28) day strength of 3000 p.s.i. For apron details see Drawing 20 in Appendix A.

Asphalt aprons are not permitted, unless otherwise approved by the Highway Construction and Engineering Division.

6-1.13.4 Baffles: Where a semi-cylindrical baffle is to be installed in a drainage structure, the minimum distance between the baffle and the opposing wall shall be two (2) feet, and the minimum distance between the baffle and the adjacent wall shall be a minimum of one (1) foot or three-fourths ($\frac{3}{4}$) of the radius of the baffle, whichever is greater.

Maintenance access structure covers shall be placed directly over the baffle, with the inside edge of the wall aligned with the inside wall of the cover opening. For a structure up to five (5) feet inside diameter, provide one (1), three (3) feet diameter cover directly over the baffle.

For a structure with more than a five (5) feet inside diameter, two (2), two (2) feet diameter covers shall be provided. The covers shall be placed directly over the baffles, and if only one baffle exists then the second cover shall be placed on the opposite side of the structure.

6-1.13.5 Top Frames, Grates and Covers: Top frames, grates and covers for all drainage structures shall be of traffic bearing design and shall be a cast of close-ground grey iron conforming to ASTM Standard A48, Class 30 with a minimum lid weight of 165 lbs. and a minimum combined weight of 410 lbs., unless otherwise approved by the Highway Construction and Engineering Division.

Castings shall be the following types, as manufactured by United States Foundry and Manufacturing Corp. or approved equal:

- Closed-lid maintenance access structure: Type 420 Frame, Type A or C cover
- Inlet-maintenance access structure: Type 3177 Frame, Type 5655 Gate
- Curb-type (FDOT #5 and #6) inlets: Type 5160 Frame, Type 6310 Gate
- Curb-type (FDOT #9) inlet: Type 5130 Frame, Type 6168 Gate
- Valley gutter (FDOT type "V") inlet: Type 5106 Frame, Type 6149 Gate
- Ditch bottom (FDOT "C") inlet: Type 4155 Frame, Type 6212 Gate
- Ditch bottom (FDOT "E") inlet: No Frame, Type 6290 Gate
- Ditch bottom (FDOT "H") inlet: No Frame, Type 6292 Gate

Castings for other applications shall be considered on a case by case basis. Steel gratings may not be used in public right-of-way unless specifically approved by the Highway Construction and Engineering Division for a particular location. All frames placed on top of slabs shall be on a minimum of two (2) courses and a maximum of four (4) courses of brick, to facilitate adjustments to conform to changes in the finished grade.

All inlet lids and grates shall be designed and placed to allow for safe traversing by pedestrians and bicycles.

All access openings in pavement shall be in accordance with Drawing 13 in Appendix A.

6-1.13.6 Testing: All tests shall be conducted by the permittee in the presence of a representative of, or the Engineer of Record, and a representative of the Highway Construction and Engineering Division.

All drainage installations shall be tested for leakage prior to backfilling. Leakage shall not exceed five-hundred (500) gal/day/inch of diameter/mile of pipe, under a minimum hydraulic head of two (2) feet. Any portion with leakage exceeding the allowable shall be corrected and retested. This shall be repeated until all portions of the installation meet the leakage requirements.

All drainage pipes and French drain pipes, above the water table, or as directed by Highway Construction and Engineering Division, shall be lamped prior to placement of the final lift of asphalt.

6-1.13.7 Cleaning and Repair of Structures and Pipes: Underwater inspection of pipes and structures shall be performed by experienced personnel trained in evaluating structural breaks, bad joints, and obstacles, by closed-circuit television or man entry. Dive crews shall obey all OSHA rules that apply to confined spaces and diving operations.

A permittee may not de-water a Broward County drainage system for cleaning or repair services without written approval from the Highway Construction and Engineering Division. A permittee may not install a plug in a Broward County drainage system without written approval from the Highway Construction and Engineering Division.

In order to verify the cleaning/repair of a submerged structure or pipe, a video tape of the structure/pipe shall be made upon completion of the project. Underwater video inspections shall be performed after the removal of plugs in order to verify that the plugs were removed.

6-1.13.8 Installation of Cured in Place Pipe (CIPP): Cured in place pipe shall be installed in accordance with, and meet the specifications of the American Society of Testing Materials (ASTM) and the National Association of Sewer Service Companies (NASSCO).

6-1.13.9 Certification: Prior to scheduling final inspection for acceptance of drainage systems, the Engineer of Record shall provide to the Highway Construction

and Engineering Division, one (1) set of certified as-built drawings signed and sealed by a Professional Surveyor and Mapper registered in the State of Florida together with the Engineer of Record certification. These drawings shall show all drainage structures, with their locations, rim and invert elevations, and structure numbers.

In every case, when the design drawings have been produced using a CAD system, the "as-built" or record drawings shall also be produced on the CAD system and the Engineer of Record shall also submit a copy of the magnetic medium containing the information from which the as-built drawings were produced.

6-1.13.10 Headwalls and Revetments: Unless otherwise approved, where embankment slopes at culvert ends and outfalls are steeper than 1:3, approved concrete endwalls shall be installed. Where embankment slopes are 1:3 or flatter, approved revetments shall be installed. This preferred type of revetment is the poured concrete-in-fabric form type, with a "quilted" appearance. Under no circumstances shall paper wrapped rip-rap be allowed.

6-1.14 Sidewalks: Sidewalks shall be of unreinforced Portland Cement Concrete and shall be as shown in Drawing 14 in Appendix A, unless otherwise approved. Alternate materials of construction, such as asphaltic concrete, and special surface treatments, such as pavers, tiles, etc., shall be considered when requested by the Engineer of Record.

Narrow grass strips (one (1) to three (3) feet) between sidewalk and curb and gutter shall be eliminated by increasing the width of sidewalk. Sidewalks adjacent to curbs shall be six (6) feet wide, unless otherwise approved by the Highway Construction and Engineering Division.

6-1.14.1 Slope: Sidewalks shall have a maximum transverse slope of 0.02 feet per foot, and a minimum transverse slope of 0.01 feet per foot, toward the swale or gutter and shall be given a transverse hair broom finish.

6-1.14.2 Thickness and Strength: Sidewalks shall have a minimum thickness of six (6) inches, a minimum twenty-eight (28) day strength of 3000 p.s.i., and a maximum allowable slump of four (4) inches. Wire or steel reinforcement is not permitted.

6-1.14.3 Obstructions: No unnecessary obstructions shall be placed in or on sidewalks unless specifically approved, on a case by case basis, by the Highway Construction and Engineering Division. All obstructions in or on sidewalks shall be so located that maximum clear width is maintained.

6-1.14.4 Maintenance of Traffic – School/Pedestrian: The provisions of Chapter 3, Section 3-1.3.7, and Section 3-1.3.9 apply.

6-1.15 Swales, Driveway Connections and Sidewalks: Swales, driveway connections and sidewalks shall be maintained by the owners of the abutting properties, in accordance with Drawings 14, 15 and 16 in Appendix A, as applicable, at no expense to Broward County.

Clear sight zones shall be provided and maintained in accordance with the provisions of FDOT "Design Standards," Index 546 (as amended), and in accordance with the provisions of the Broward County Land Development Code.

Swales that are paved or are proposed to be paved and shall exceed thirty (30) percent of lot frontage or eighteen (18) feet, whichever is greater, shall be required to install drains as shown on Drawing 17 in Appendix A, unless a positive drainage system has already been installed or is proposed to be installed by the County. All swale drainage facilities not part of a positive, right-of-way drainage system shall be maintained by the owner of the abutting private property.

For a duplex or a single family home, no single driveway pavement shall exceed eighteen (18) feet. Where a lot is in a location or orientation that allows for construction of a circle driveway, then the combined driveway pavement widths shall not exceed twenty-eight (28) feet (for example an eighteen (18) foot wide driveway, two-car driveway with a ten (10) foot circle driveway). Driveways shall be setback a minimum of five (5) feet from the side property line unless approved by the Highway Construction and Engineering Division based upon a field inspection which determines that there shall be adequate onsite drainage for storm water retention.

Multi-family and non-residential development shall be designed with an onsite parking lot and driveways which comply with the standards of the Broward County Land Development Code.

Driveways that exceed these standards shall be reviewed on a case by case basis according to standard acceptable engineering practices and shall require approval by the Highway Construction and Engineering Division Director or designee.

Gravel shall not be placed in swales, and parking in swales is prohibited, in accordance with Chapter 25, Section 25.19, of the Broward County "Administrative Code."

6-1.16 Grassing/Seeding/Mulching/Sodding/Fertilizing: Whenever a suitable length of roadway slope(s) or adjacent areas have been graded, they shall be grassed at the earliest practical time, and in all cases, before the final paving course. In most cases, grass seed should be used. In areas where erosion and/or growing conditions may be a problem, solid sod should be installed. All grass placed in public right-of-way shall be Argentine Bahia unless a different variety is approved. The permittee shall maintain the grass, including watering and mowing until the project is accepted. Areas to be grassed shall have a growing stand of grass for a period of at least one (1) year after completion/approval of the project. All grassed areas shall be mowed at least once prior to acceptance of the project.

6-1.17 Restoration: The entire work area utilized for the performance of any permitted work shall be restored by the permittee to meet current standards for new construction.

6-1.18 Finished Rock Survey: Record Drawings of the finished rock base drawn at the same scale as the approved construction drawings shall be submitted to the

Highway Construction and Engineering Division for approval before proceeding with an asphalt pavement.

These drawings shall be signed and sealed by a Professional Surveyor and Mapper registered in the State of Florida, and shall show finished rock base elevations and offsets at centerline, edge of median and edge of pavement, plus elevations of bottom of swale or flow line of gutter, top of curb and right-of-way line, at high and low points, intersections and changes in slope.

Elevations shall be verified and shown at intervals not to exceed three-hundred (300) feet, measured along the profile grade line, for projects over fifteen-hundred (1500) feet in length; every one-hundred (100) feet for projects five-hundred (500) feet to fifteen-hundred (1500) feet in length; and, every fifty (50) feet for projects under five-hundred (500) feet in length.

These elevations shall be depicted on a set of plans at the same scale, with sufficient clarity to make judgment of acceptability possible. The drawings shall also bear the certification of a P.E. registered in the State of Florida, stating that the installation shown thereon has been made in substantial conformance with the approved drawings.

Compaction shall be verified by an independent certified Engineering Testing Laboratory by making Field Density Tests of each layer of compacted material at prescribed intervals before the succeeding layer is placed.

Test reports and rock "as-built"/record drawings shall be submitted to the Highway Construction and Engineering Division and be approved before paving operations begin.

6-1.19 Final Inspection and Acceptance: After construction is completed and all certifications, record drawings and other required documents have been submitted to the Highway Construction and Engineering Division, and accepted, but before the one (1) year Maintenance period for which security has been posted begins, the permittee shall request a final inspection of the project. The Highway Construction and Engineering Division, all other interested parties shall jointly perform such inspection to determine the acceptability of the project for service. Following the inspection, any noted defects shall be corrected by the permittee, after which the Highway Construction and Engineering Division and other maintaining agencies, shall issue a notice of approval. The date of the notice of approval shall be the start of the one (1) year warranty period.

6-2 PAVEMENT MARKING/SIGNING/SIGNALIZATION/SCHOOL FLASHERS

6-2.1 Pavement Markings - General: The design and construction of pavement marking systems shall be in accordance with the following standards:

- Broward County "Traffic Engineering Standards and Specifications"
- Broward County "Neighborhood Traffic Management Manual"
- FHWA "Manual on Uniform Traffic Control Devices"

- FDOT "Design Standards"
- FDOT "Standard Specifications for Road and Bridge Construction"

6-2.1.1 Pavement Marking Plan: Pavement Marking and Signing plans shall be included with each set of drawings submitted to the Highway Construction and Engineering Division, as part of the total paving and drainage plan submittal for review and approval. These plans shall show all new markings including tie-ins to existing markings. Removal of conflicting markings shall be shown. Materials shall be specified.

The location and type of raised reflective pavement markers shall be identified, as shown on Drawings 26 and 27 in Appendix A. FDOT pay item numbers shall be used.

6-2.1.2 Permanent Pavement Markings: Permanent pavement markings shall consist of alkyd-based extruded or ribbon thermoplastic or preformed plastic material. All such materials shall be fully retro-reflectorized.

6-2.1.3 Temporary Pavement Markings: Temporary pavement markings may be used during intermediate phases of road construction or where further construction of the road is imminent (generally within one (1) year). Temporary markings shall consist of paint or traffic tape. All such markings shall be fully retro-reflectorized.

6-2.1.4 Old Pavement Markings: Unless otherwise approved, old pavement markings or conflicting pavement markings shall be "removed" by covering with a full lane width of pavement resurfacing, sandblasting, or water blasting prior to installing new pavement markings, the full length of the project or that portion in which the construction and required new markings create conflicts with the old. The extent of the resurfacing/removal required shall be determined jointly by the, Highway Construction and Engineering Division and the Traffic Engineering Division, in the field, based upon observation of field conditions.

6-2.1.5 Construction/Resurfacing: Pavement markings (either permanent or temporary) shall be installed as soon as practical following paving. The pavement marking permittee shall be onsite at the start of the construction or resurfacing project. In the event that a road is placed in service, the temporary or permanent pavement striping shall be applied by the end of each day's operation. In the event of inclement weather the project shall be striped as soon as practical, once the weather has improved. Any road placed in service without striping shall have the traffic lanes delineated in accordance with part six (6) of FHWA "Manual on Uniform Traffic Control Devices."

6-2.1.6 Storage of Barricades and Materials: Barricades and materials may not be stored in public right-of-way.

6-2.1.7 Pavement Markings on New Asphalt: Pavement markings are required on all new asphalt, prior to night fall.

6-2.1.8 Pavement Marking Requirements: All pavement markings shall be visible at night, and shall be retro-reflective.

6-2.2 Signs - General: The design and construction of traffic signs shall be in accordance with the following standards:

- Broward County "Traffic Engineering Division Standards and Specifications"
- Broward County "Neighborhood Traffic Management Manual"
- FHWA "Manual on Uniform Traffic Control Devices"
- FDOT "Design Standards"
- FDOT "Standard Specifications for Road and Bridge Construction"

6-2.2.1 Signing Plan: Signing and pavement marking plans shall be included with each set of drawings submitted to the Highway Construction and Engineering Division, as part of the total paving, grading and drainage plan submittal set for review and approval. The plan shall show all new signs and all existing signs to be removed. Where appropriate, existing signs to remain shall be shown. FDOT pay item numbers shall be used. For sign and pavement marking details see Drawings 25, 26 and 27 in Appendix A.

6-2.2.2 All "STOP," 4-WAY (R1-3 or R1-4), "DO NOT ENTER," "WRONG WAY," and "YIELD" signs shall be fabricated entirely with Diamond Grade (3M VIP #3990) material or equal. "STREET NAME" signs and "OTHER" signs shall be fabricated using high intensity grade (3M #3870) material or equal. Signs within the parking series may be Engineering Grade (3M #3290) material or equal. Post-mounted signs shall be mounted on single or double steel U-Channel posts, as shown on Drawing 25 in Appendix A. Tubular posts shall not be used.

6-2.2.3 Maintenance of Signs during Construction: All existing regulatory, warning and street identifier signs that are applicable, as determined by the Traffic Engineering Division shall be maintained during construction. All temporary signs shall conform to the MUTCD. Existing guide signs that are determined to be applicable shall be maintained. Existing signs that are not applicable shall be covered or removed.

6-2.2.4 Design of Supports: Shop drawings and quantities for overhead sign structures, special designs for ground sign structures, and large guide sign panels shall be submitted to the Highway Construction and Engineering Division for approval. To determine a sign item number, profile size, wind zone and area; refer to FDOT "Design Standards."

Minimum vertical clearances for overhead signs shall be as detailed in FDOT "Design Standards."

6-2.3 Signalization - General: The design and construction of traffic signals shall be in accordance with the latest editions of the following standards:

- Broward County "Traffic Engineering Division Standards and Specifications"
- Broward County "Neighborhood Traffic Management Manual"
- FHWA "Manual on Uniform Traffic Control Devices"

- FDOT "Design Standards"
- FDOT "Standard Specifications for Road and Bridge Construction"

6-2.3.1 Materials: All materials shall be on FDOT Approved Products List (APL), and must be approved by the Traffic Engineering Division prior to installation. All materials and workmanship shall meet the requirements of the following publications:

- FHWA "Manual on Uniform Traffic Control Devices"
- The National Electrical Code
- Industrial Control Standards of NEMA
- Applicable state and local agency standards

All materials used shall be as specified by the Traffic Engineering Division.

6-2.3.2 Signalization Plan: No work may be performed at any existing or proposed traffic signal location without a plan approved by the Traffic Engineering Division. No changes shall be made to any approved signalization or interconnect plans, equipment specifications or installation details without prior written approval of the Traffic Engineering Division. For additional requirements contact the Traffic Engineering Division.

6-2.3.3 Notification: The Traffic Engineering Division Systems Engineer shall be notified in writing at least forty-eight (48) hours prior to any work being performed at a signalized location in order to properly transfer maintenance responsibilities. Either fax the information to the Systems Engineer or mail it to:

Systems Engineer
 Broward County Traffic Engineering Division
 2300 West Commercial Boulevard
 Fort Lauderdale, Florida 33309

6-2.3.4 Shop Drawings: The permittee shall submit to the Traffic Engineering Division for approval, the manufacturer's descriptive literature and technical data which fully describes the types of signal equipment proposed for use, and shall not order this equipment prior to receipt of such approval.

6-2.3.5 Record Drawings: The Traffic Engineering Division shall be provided with two (2) sets of "as-built" drawings of the traffic signal installations, at the time of inspection.

6-2.3.6 Equipment Removal: All signalization equipment that is removed except as further noted or as directed by the Engineer of Record shall properly be disposed of at the permittee's expense. All poles without foundations (including uprights and mast arms), the control cabinet and all of its contents, any above-ground detection, and all LED modules (vehicle and pedestrian) shall be disassembled into their component parts, tagged as to location, packaged as needed for protection from damage and delivered to:

Broward County Traffic Engineering Division
Operations Building
2300 West Commercial Boulevard
Fort Lauderdale, Florida 33309

The Warehouse Manager is to be contacted at least forty-eight (48) hours prior to delivery.

Written acknowledgement of equipment receipt shall be obtained from the Warehouse Manager in the form of a signed receipt bearing the permittee's letterhead. This itemized receipt must state that all of the equipment as described above from each location was returned to the Traffic Engineering Division in good condition. The permittee shall present this receipt to the Traffic Engineering Division at the time of signal inspection. Absence of such receipt shall be recorded on the punch list as an item to be corrected prior to final approval of the installation.

6-2.3.7 Signal Turn-ons: Early turn-on of any new signal installation shall only be permitted if authorized in writing by the Traffic Engineering Division. If early turn-ons are required the permittee shall be responsible for maintenance of the signals during that period. New signal locations shall not be placed on full color operation until the date of inspection except as stated above. New signal locations shall be flashed no less than three (3) days, nor more than fourteen (14) days prior to the inspection. Signal heads are to remain bagged with burlap or turned back until this time. Existing stop signs shall be removed by the permittee on the date of inspection when signals are placed into full color operation.

6-2.3.8 Acceptance: All new or modified traffic signals shall be inspected by the Traffic Engineering Division, which shall be notified in writing to the Systems Engineer when the work is completed and ready for inspection. The Traffic Engineering Division shall schedule and perform the inspection and issue a conditional acceptance if the work is satisfactory. Final acceptance of the work shall be issued upon successful completion of the punch list items and a sixty (60) day burn-in period.

6-2.4 School Flashers - General: The design and construction of school flasher signals shall be in accordance with the latest editions of the following standards:

- Broward County "Traffic Engineering Division Standards & Specifications"
- FHWA "Manual on Uniform Traffic Control Devices"
- FDOT "Design Standards"
- FDOT "Standard Specifications for Road and Bridge Construction"

6-2.4.1 Materials: All materials shall be on the FDOT Approved Products List (APL), and shall be approved by the Traffic Engineering Division prior to installation. All materials and workmanship shall meet the requirements of the latest editions of the following publications:

- FHWA "Manual on Uniform Traffic Control Devices"
- The National Electrical Code

- Industrial Control Standards of NEMA

All materials used in the work shall be as specified by the Traffic Engineering Division.

6-2.4.2 School Flasher Plan: No work may be performed at any existing or proposed school flasher location without an approved plan from the Traffic Engineering Division. No changes may be made to the approved school flasher plan, equipment specifications or installation details without prior approval of the Traffic Engineering Division.

6-2.4.3 Shop Drawings: The permittee shall submit to the Traffic Engineering Division for approval, the manufacturer's descriptive literature and technical data which fully describes the types of school flasher equipment proposed for use, and shall not order this equipment prior to receipt of such approval.

6-2.4.4 Record Drawings: The Traffic Engineering Division shall be provided with two (2) sets of "as-built" drawings of the school flasher installations at the time of inspection.

6-2.4.5 Equipment Removal: All school flasher equipment, except strain poles, that is removed shall be disassembled, tagged as to location, packaged as needed for protection from damage and delivered to:

Broward County Traffic Engineering Division
Operations Building
2300 West Commercial Boulevard
Fort Lauderdale, Florida 33309

The Warehouse Manager is to be contacted at least forty-eight (48) hours prior to delivery.

6-2.4.6 School Flasher Turn-ons: New school flasher locations shall not be placed in operation until the date of inspection. School flashers signal heads and sign panels shall be covered and bagged with burlap and turned back until this time.

6-2.4.7 Acceptance: All new or modified school flashers shall be inspected by the Traffic Engineering Division. When the work is completed, has been energized by FPL, and the locations are ready for inspection, the Traffic Engineering Division Special Projects Coordinator shall be notified in writing, either by e-mail or by fax. The Traffic Engineering Division shall then schedule and perform the inspection and issue a conditional acceptance if the work is satisfactory. Final acceptance of the work shall be issued upon successful completion of all punch list items.

6-3 BIKE PATHS/LANES (INDEPENDENT OF ROADWAY)

6-3.1 Design Criteria: Design of bike paths and lanes shall comply with the latest requirements/guidelines/standards of the Federal Highway Administration, FDOT "Bicycle Facility Planning and Design Manual," FDOT "Design Standards," FHWA "Manual on Uniform Traffic Control Devices," and Broward County "Traffic Engineering Division Standards and Specifications."

6-4 RECREATIONAL TRAILS AND MULTI-PURPOSE PATHS: Recreational Trails and Multi-Purpose Paths shall meet the combined applicable standards established for the anticipated uses. For example, a recreational trail intended for use by both cyclists and pedestrians shall be at least four (4) feet in width for pedestrian use plus an additional eight (8) feet wide for two-way bicycle traffic, as well as meeting bikeway standards for sight distances and turning radius.

CHAPTER 7 – LOCAL ROADS - TECHNICAL REQUIREMENTS

7-1 CRITERIA

7-1.1 Minimum Design Criteria: The provisions of Chapter 6, Section 6-1.1 shall apply.

7-1.2 Construction Criteria: The provisions of Chapter 6, Section 6-1.2 shall apply.

7-1.3 Typical Sections: The provisions of Chapter 6, Section 6-1.3 shall apply.

A typical section shall be shown on all plans. For submittal of a new roadway or new through lanes, the applicant shall submit sketches of the proposed typical right-of-way sections to the Highway Construction and Engineering Division for approval prior to beginning the preparation of plans. Proposed typical right-of-way cross sections shall follow the provisions outlined in Section 5-192(c) (2) of the Broward County Land Development Code. The Highway Construction and Engineering Division may require submittal of a traffic study that evaluates the anticipated traffic volume and the capacity of the new roadway based on Florida Department of Transportation standards. The typical sections shall show or note all of the applicable design elements outlined in the "Green Book." Where determination of the "ultimate through lane" is necessary, it shall be made in this review.

7-1.4 Safety Criteria: The minimum safety criteria for design of local roads and streets in Broward County shall meet or exceed the applicable requirements of all standards referenced in Chapter 6, Sections 6-1.1 and 6-1.2 of this document.

Unless otherwise approved, the minimum clear recovery zone width in urban and suburban areas shall be six (6) feet for uncurbed roads and four (4) feet for curbed roads.

7-1.5 Guardrail: The provisions of Chapter 6, Section 6-1.5 shall apply, except that the minimum distance from the outside edge of the ultimate through travel lane to the top of the ultimate side slope (top of a bank) of any lake or canal shall be forty (40) feet. Reduction of this distance to twenty-eight (28) feet shall be considered on a case-by-case basis.

7-2 CONSTRUCTION OF ROADWAY ELEMENTS: All construction materials and methods shall meet the requirements of FDOT "Standard Specifications for Road and Bridge Construction," except as modified hereinafter, and shall also meet the provisions of Chapter 3 of this document.

7-2.1 Subgrades: The provisions of Chapter 6, Section 6-1.6 shall apply.

7-2.2 Bases: Unless otherwise approved by the Highway Construction and Engineering Division, limerock bases shall be eight (8) inches thick and shall be constructed in two (2) - four (4) inch lifts. Limerock of the Miami formation shall be used, and shall have a minimum carbonate content of 60% and a minimum LBR of 100. All bases shall be primed as per FDOT standards.

Base material shall be compacted to a density of not less than 98% of maximum density as determined by AASHTO T-180.

7-2.2.1 Alternate Base: The provisions of Chapter 6, Section 6-1.7.3 shall apply.

7-2.3 Wearing (Surface) Courses: The surface course is to be one-and-one-half (1-1/2) inches of asphaltic concrete of FDOT Type S-III.

7-2.4 Swales: The provisions of Chapter 6, Section 6-1.12 shall apply.

7-2.5 Drainage: All drainage facilities and systems within public right-of-way shall be in accordance with the provisions of Chapter 6, Section 6-1.13, except that drainage pipe shall be reinforced concrete, or corrugated aluminum unless an alternate material is approved.

7-2.6 Speed Humps: Speed humps shall have a length of fourteen (14) feet, consisting of a three (3) foot ramp on each side, and an eight (8) foot flat top. The height of the speed humps shall be a maximum of three (3) inches. The standard width of the speed humps is twenty-two (22) feet; however, the actual width installed shall be determined based on field conditions and the lane widths. For speed hump details see Drawing 28 in Appendix A.

7-2.7 Sidewalks: The provisions of Chapter 6, Section 6-1.14 shall apply.

7-2.8 Swale Paving, Driveway Connection and Sidewalk Maintenance: The provisions of Chapter 6, Section 6-1.15 shall apply.

7-2.9 Curbs, Gutters and Precast Inlet Tops: Curbs, gutters and precast inlet tops shall be in accordance with the provisions of Chapter 6, Section 6-1.10, except that limerock bases need only have a calcium carbonate content of 60%.

7-2.10 Grassing/Seeding/Mulching/Sodding/Fertilizing: The provisions of Chapter 6, Section 6-1.16 shall apply.

7-2.11 Restoration: The provisions of Chapter 6, Section 6-1.17 shall apply.

7-2.12 Finished Rock Survey: The provisions of Chapter 6, Section 6-1.18 shall apply.

7-2.13 Pavement Marking, Signing, Signalization and School Flashers: The provisions of Chapter 6, Section 6-2 shall apply.

7-2.14 Record Drawings and Certifications: The provisions of Chapter 6, Section 6-1.18 shall apply.

7-2.15 Final Inspection and Acceptance: The provisions of Chapter 6, Section 6-1.19 shall apply.

CHAPTER 8 – HIGHWAY BRIDGES - TECHNICAL REQUIREMENTS

8-1 DESIGN CRITERIA: The Bridges shall be designed in accordance with AASHTO Standard Specifications for Highway and Bridge Construction, and applicable FDOT Design Manuals. Design loading shall be HS-25-44.

8-2 CONSTRUCTION CRITERIA: Construction materials and methods shall meet the requirements of FDOT "Standard Specifications for Road and Bridge Construction" and FDOT "Structures Standards" except as modified herein.

8-2.1 Pile Logs: Legible driving logs of all bearing piles shall be kept by the permittee and a photocopy of each page shall be delivered to the Highway Construction and Engineering Division within three (3) working days after the driving is completed. Each page shall be signed by the person keeping the log and shall contain the following information for each pile: the type of pile; the date driven; the pile dimensions; the design loading of the pile; the twenty-eight (28) day concrete compressive strength; the ground elevation at the time of driving; the cutoff elevation; the blows per foot for each foot driven; the tip elevation after driving; the type, make and model of pile driver; the energy delivered to the pile upon impact; the operating pressure of the pile driver (if applicable), and any other relevant data or observations of the person keeping the log. Significant cracks and/or spalls of the pile concrete should be noted and shown on a sketch.

8-2.2 Expansion Joints: All roadway expansion joints shall be topped with a one (1) inch depth of poured sealant.

8-2.3 Handrails: Due to the high incidence of vandalism, the use of aluminum handrail should not be universal. The use of alternate installations should be considered, and submitted to the Highway Construction and Engineering Division for approval.

8-2.4 Utility Crossings: Unless otherwise approved and permitted by the Highway Construction and Engineering Division, only those items that are directly related to traffic safety or the function of the bridge shall be mounted or fastened upon any bridge under Broward County jurisdiction. Electric power or telecommunication services may utilize conduits placed within the bridge sidewalk concrete during the construction of the bridge subject to the approval of the Highway Construction and Engineering Division.

All metal mounted on or projecting from any County bridge shall be stainless steel, unless otherwise approved. Dissimilar metals shall be separated by an approved insulating device. During the design of the bridge, appropriate provisions shall be made for the incorporation or accommodation of other utilities.

8-2.5 Retaining Walls: Retaining walls shall be designed by a Florida Registered Engineer in accordance with sound Engineering principles. Walls may be of pile and slab, sheet pile, gravity, "reinforced earth" or other approved type. Plans, accompanied by design calculations, shall be submitted in triplicate to the Highway Construction and Engineering Division for approval before a construction permit can be obtained.

8-2.6 Slope Protection

8-2.6.1 Slopes at Abutments: Embankment slopes greater than 1:4 should receive erosion control treatment. The preferable method is to use a concrete filled revetment mat, placed over filter fabric material, as shown on Drawing 24 in Appendix A.

The revetment mat should extend from the front of the bridge abutment to a point at least two (2) feet below water level. It should also extend a minimum of ten (10) feet beyond the ends of the bridge abutments and return around the ends of the abutments and approach slabs.

Installation shall be as shown on Drawing 24 in Appendix A, and as per manufacturer's recommendations.

Alternate methods of slope protection shall be considered on a case-by-case basis.

8-2.6.2 Slopes at Approach Slabs: Slopes not required to receive treatment as described in Section 8-2.6.1, above, shall be grassed in accordance with Chapter 6, Section 6-1.16.

8-2.7 Concrete Finishes: All exposed surfaces of concrete traffic barriers, hand-rail barriers, sides of deck units and end bent wing walls shall receive a Class "5" applied finish coating (see FDOT Standards), unless otherwise approved by the Highway Construction and Engineering Division.

Areas used by motor vehicles, bicycles or pedestrians shall have non-skid surfaces.

8-2.8 Utility Conduits in Sidewalks: All bridges shall be designed with a minimum of four (4) - six (6) inch PVC conduits in each sidewalk to provide the maximum capacity for crossings of electrical power, telecommunications, and /or gas utilities. These conduits are the preferred locations for crossings of the above utilities. Where these facilities are available and suitable, no external mounting shall be allowed on any County bridge.

8-2.9 Maintenance of Traffic: Where an existing bridge is being modified or replaced by a new structure, pedestrian and vehicular traffic and access to mass transit facilities shall be maintained during periods of "phased" construction.

CHAPTER 9 – WATER DISTRIBUTION AND SEWAGE COLLECTION SYSTEMS - GENERAL REQUIREMENTS

9-1 PERMITS

9-1.1 Issuance: Permits for construction or maintenance of water distribution and sewage collection systems or the additions thereto, shall be issued only after the following requirements have been completed:

9-1.1.1 Subdivision Plats: A subdivision plat for the area of the proposed construction has been recorded in the public records of Broward County. This requirement shall not apply to the installation of lines in or through areas already platted or within dedicated public right-of-way, or within easements or public right-of-way extending across undeveloped areas.

9-1.1.2 Water and Sewer Plan Approval: Water and sewer plans have been submitted to and approved by the Highway Construction and Engineering Division. For projects involving paving and/or drainage work as well, water, sewer, paving and drainage plans shall be submitted concurrently.

9-1.1.3 Project Plans and Technical Specifications Approval: Project plans, if any, and technical specifications have been approved by the Highway Construction and Engineering Division.

9-1.1.4 Provisions of Chapter 4: The provisions of Chapter 4, Section 4-1 of this document have been met.

9-2 FEES AND SECURITY

9-2.1 Calculation of Security Amounts and Fees: The separate security amounts and fees are to be computed in accordance with the provisions of Chapter 4, Section 4-3.

9-2.2 Re-inspection and Retesting Fees: The provisions of Chapter 4, Section 4-3.3 shall apply.

9-3 PLANS AND SPECIFICATIONS

9-3.1 Plan Submittal Requirements: Three (3) sets of plans, approved by the operating utility, which have been signed and sealed by a P.E. licensed in the State of Florida, shall be submitted to the Highway Construction and Engineering Division for review and approval on projects for which Paving and Drainage review is not required. On projects for which Paving and Drainage review is required, seven (7) sets of plans, signed, sealed and approved by the operating utility, shall be submitted concurrently with the Paving and Drainage drawing submittal.

9-3.2 Benchmarks: Accessible Benchmarks shall be listed on all plans, using the National Geodetic Vertical Datum (NGVD).

9-3.3 *Sheet Size*: All plans shall be submitted on white paper with blue or black lines. All plans shall be submitted on 24" x 36" sheets. Small projects may be submitted on legal size paper, provided that scale requirements are met and only one (1) sheet is required.

9-3.4 *Utilities*: All plans shall show all existing adjacent utilities as well as all other known planned utilities sufficiently to permit judging of the compatibility of the proposed work with the existing and planned systems. All existing utilities that have been abandoned, but are still in the ground, shall be shown on the plans and labeled as "abandoned."

9-3.5 *Plan Layout*: All general area layout plans shall be prepared at a scale of three hundred (300) feet or less to the inch. Detailed plans for arterial roads and collector roads shall be prepared at a scale of twenty (20) feet or less to the inch. Detailed plans for local subdivision roads shall be prepared at a scale of forty (40) feet or less to the inch. Sewer profiles shall be the same horizontal scale as the plans. All elevations shall be based on the National Geodetic Vertical Datum (NGVD).

9-3.6 *Abutting Subdivisions*: The names and boundaries of all abutting subdivisions shall be shown, giving the plat book and page number of the recordation of each.

9-3.7 *Non-platted Areas*: Areas not platted shall be shown as acreage, and the Section, Township and Range shall be noted.

9-3.8 *Right-of-Way Dimensions*: Dimensions of public right-of-way shall be indicated.

9-3.9 *Legends*: All plans shall show suitable legends.

9-3.10 *Detailed Plans*: The detailed plans shall show water and/or sewer main materials, sizes, and their dimensioned locations. They shall also show the locations of valves, hydrants, maintenance access structures, tees, wyes and approximate locations of house connections.

9-3.11 *Pavements*: Existing and proposed pavements shall be clearly indicated on the drawings and shall be dimensionally located within public right-of-way. Proposed cuts in pavement shall be shown and noted.

9-3.12 *Street Identification*: All streets shall be identified.

9-3.13 *Existing Utility Locations*: When locations of existing utilities cannot be determined, this shall be so noted.

9-3.14 *Bus Stops and Related Facilities*: Locations of bus stops and related facilities shall be shown.

9-3.15 *Service Laterals*: Service laterals which are to be installed during the original installation of main(s) shall be indicated, but need not have dimensioned locations on original plans. Plans for services to be installed as a separate project, after installation of main(s), shall be noted and explained.

9-3.16 Specifications: Specifications for the proposed work shall be submitted with the plans. A notation shall be made on the plans that all installations shall be in conformity with the "Minimum Standards." Specifications may be omitted in connection with plans for minor extensions of existing systems provided that the extensions are to be constructed in accordance with the requirements of these Minimum Standards.

9-3.17 Identity of Utility Companies: The identity of the operating or maintaining utility companies shall be indicated on the plans.

9-4 THRUST BLOCKS: The use of concrete thrust blocks is prohibited within public right-of-way, unless an approved form of mechanical restraint cannot be utilized.

CHAPTER 10 – WATER DISTRIBUTION SYSTEMS - TECHNICAL REQUIREMENTS

10-1 STANDARDS: All water distribution systems constructed in public right-of-way shall meet or exceed the provisions of this document and the following standards, specifications and regulations. All installations shall be in accordance with the manufacturer's recommendations except where these Standards are more stringent.

- Broward County Public Health Department (BCPHD)
- Florida Department of Health
- Florida Department of Environmental Protection
- Broward County Environmental Protection Department
- Recommended Standards for Water Works
- Broward County Fire Protection Division
- Building and Zoning and other agencies as applicable
- American Water Works Association Standards (AWWA)
- FDOT "Utility Accommodation Manual"
- American National Standards Institute (ANSI)
- American Society for Testing Materials (ASTM)
- Broward County Water and Wastewater Operations Division (WWOD) "Minimum Design and Construction Standards"

10-2 MATERIALS: All pipe, pipe fittings and specials intended for water distribution or transmission systems shall be designed for a minimum working pressure of one-hundred-fifty (150) p.s.i., and shall be NSF 61 compliant.

10-2.1 Pipe: All main piping shall be of ductile iron or reinforced concrete or PVC unless otherwise approved.

Flow characteristics shall govern the sizes of mains to be used except that the minimum size to be used shall be eight (8) inches unless otherwise approved. In certain cases, a six (6) inch main and/or short runs to hydrants shall be acceptable.

10-2.1.1 Ductile Iron Pipe: Ductile iron pipe shall conform to AWWA/ANSI Standard C151/A21.51 "Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds" and C150/A21.50, "Thickness Design of Ductile Iron Pipe." For new systems or new extension to existing systems, ductile iron pipe shall conform with pressure classification 350 for sizes six (6) inches through twenty-four (24) inches, and pressure classification 250 for sizes over twenty-four (24) inches.

Ductile iron pipe shall be cement-lined and seal-coated in accordance with AWWA/ANSI Standard C-104/A 21.4, or with Highway Construction and Engineering Division approval, shall be poly-lined or coated with the manufacturer's epoxy coating systems.

All ductile iron pipes shall have restrained joints.

10-2.1.2 Reinforced Concrete Pressure Pipe: The use of reinforced concrete pressure pipe shall be limited to sizes twenty-four (24) inches and over. It shall be of the steel cylinder type, shall be prestressed and shall conform to AWWA Standard C-301 unless otherwise approved. All concrete for these pipes shall be made with Type II cement, exclusively.

10-2.1.3 Asbestos-cement Pipe: Asbestos-cement pipe shall not be permitted on new construction. Repairs to existing asbestos cement pipe shall be subject to Highway Construction and Engineering Division approval as to methods and materials used.

Where roads are to be built, widened or rebuilt, existing asbestos cement pipe under the area to be paved shall be deactivated and removed. If removal and disposal are not practical, the alternative method of flushing and filling the pipe with grout may be used, if approved by the Highway Construction and Engineering Division.

10-2.1.4 Air Release Valve Piping: Piping to and from air release valves shall be Schedule 40 stainless steel or Schedule 80 PVC, with threaded joints.

10-2.1.5 Service Laterals: Service laterals from one (1) inch through two (2) inches inclusive shall be of copper tubing (flare or compression connection),

Services over two (2) inches shall conform to the provisions of this Chapter as applicable, unless otherwise approved.

10-2.1.5.1 Copper tubing shall be Type "K" and shall conform to ANSI/AWWA Standard 75CR. Fittings shall comply with ANSI/AWWA Standard C-800.

10-2.1.5.2 Plastic pipe for service laterals shall be polyethylene SDR-9 CTS-OD or polybutylene tubing only and shall meet the following requirements:

Polyethylene tubing shall be extruded from PE34068 high molecular weight materials, as per ANSI/AWWA Standard C-901 and shall conform to ASTM Specification D-2737.

Polybutylene tubing shall be extruded from PE2110, Type 2, Grade 1, Class B or C material as per ANSI/AWWA Standard C-902 and shall conform to ASTM Specification D-2581.

10-2.2 Fittings

10-2.2.1 Ductile Iron Fittings: Ductile iron fittings shall conform with ANSI/AWWA Standard C-110/A21.10. Fittings six (6) inches and larger shall be lined as provided in Section 10-2.1.1.

10-2.2.2 Pre-stressed Concrete Pressure Pipe Fittings: Fittings for pre-stressed concrete pressure pipe shall conform to AWWA Standard C-301.

10-2.3 Joints

10-2.3.1 Joints for Ductile Iron Pipe: Joints for bell and spigot ductile iron pipe and fittings shall conform to ANSI/AWWA Standard C-111/A21.11. Mechanical joint or push-on joint to be rubber gasket compression-type. Special fittings and joints shall be considered for specific installations subject to the approval of the Highway Construction and Engineering Division.

10-2.3.2 Joints for Reinforced Concrete Pipe: Joints for reinforced concrete pipe shall be of rubber gasket compression type conforming to AWWA STANDARD C-301.

10-2.3.3 Solvent Weld or Threaded Joints: No solvent weld or threaded joints shall be permitted, except for air release valve piping.

10-2.3.4 Mechanical Restraints: Mechanical restraints shall be provided on all mains in lieu of thrust blocks at all tees, hydrants and changes of direction, unless it is demonstrated that such restraint cannot reasonably be accomplished or would be undesirable.

10-2.4 Valves

10-2.4.1 Gate Valves Six (6) Inches and Larger: Metal-seated gate valves six (6) inches and larger shall comply with AWWA Standard C-500 and shall have the following features:

10-2.4.1.1 All gate valves are to be bronze mounted, double-disc, parallel seat type, opening Left (counter-clockwise). Non-geared valves shall be furnished with "O" ring packing (two (2) "O" rings). The operating mechanism shall be for buried service, with a two (2) inch square operating nut.

10-2.4.1.2 Valves sixteen (16) inches and larger shall be furnished with beveled gearing and by-pass valve. Beveled gear valves shall have rollers, tracks and scrapers.

10-2.4.1.3 Gate valves six (6) inches through twelve (12) inches shall have a minimum designed working pressure of two-hundred (200) p.s.i. and shall be tested at four-hundred (400) p.s.i. Gate valves sixteen (16) inches through forty-eight (48) inches shall have a minimum designed working pressure of one-hundred-fifty (150) p.s.i. and shall be tested at three-hundred (300) p.s.i.

10-2.4.2 Gate Valves Under Six (6) Inches: Gate valves under six (6) inches in size shall be bronze with a minimum working pressure of one-hundred-fifty (150) p.s.i. and shall conform to MSS standard practice SP-37 unless otherwise directed by the Highway Construction and Engineering Division. Pewter and pot-metal operating wheels shall not be permitted.

10-2.4.3 Butterfly Valves: Butterfly valves shall be designed and manufactured in accordance with ANSI/AWWA Standard C-504 for Rubber Seated Valves Class 150B.

10-2.4.4 Resilient Seat Valves Six (6) Inches and Larger: Resilient Seat Valves shall comply with AWWA Standard C-509 and shall have a minimum working pressure of two-hundred (200) p.s.i.

10-2.4.5 Ball Valves: Ball valves shall conform to ANSI/AWWA Standard C-507 for one-hundred-fifty (150) p.s.i. pressure class. The valve body shall be cast iron or ductile iron.

10-2.4.6 Check Valves: Check valves four (4) inches and larger shall comply with AWWA Standard G-508, or shall be resilient seated, flexible, rubber coated disc type.

10-2.4.6.1 Check valves four (4) inches through twelve (12) inches shall have minimum working pressure of one-hundred-seventy-five (175) p.s.i.

10-2.4.6.2 Check valves fourteen (14) inches through twenty-four (24) inches shall have minimum working pressure of one-hundred-fifty (150) p.s.i.

10-2.4.7 Plug Valves: Plug Valves shall not be used on water mains.

10-2.4.8 Tapping Sleeves and Valves: Tapping sleeves shall conform to MSS Standard SP-60. All gaskets shall be neoprene, "O"-ring type. Gasket restraint provisions shall be incorporated into the body of the sleeve. A test plug shall be provided at the outlet throat.

10-2.4.8.1 Tapping gate valves six (6) inches through twelve (12) inches shall comply with ANSI/AWWA Standard C-500, or C-509. The valve port shall be free and full to allow unobstructed passage of the portion of the pipe wall cut out during the tap.

10-2.4.8.2 Valves sixteen (16) inches and larger shall be furnished with a by-pass valve.

10-2.4.8.3 Gate valves six (6) inches through twelve (12) inches shall have a minimum working pressure of two-hundred (200) p.s.i., and be tested at four-hundred (400) p.s.i. Valves sixteen (16) inches through forty-eight (48) inches shall have a minimum working pressure of one-hundred-fifty (150) p.s.i. and be tested at three-hundred (300) p.s.i.

10-2.4.9 Valve Boxes: Valve boxes shall be cast iron extension type with not less than a five-and-one-quarter (5-1/4) inch diameter shaft, and with locking covers marked as appropriate. Covers shall be Tyler Pipe Series 6850, or as otherwise approved.

10-2.4.9.1 All valve boxes shall be located in public right-of-way or a public utility easement.

10-2.4.9.2 All valve boxes in paved areas, except those in concrete sidewalks, shall have a twenty-four (24) inch x twenty-four (24) inch x eight (8) inch thick concrete collar set three (3) inches below the surrounding finished grade.

10-2.5 Fire Hydrants

10-2.5.1 Standards: All fire hydrants shall comply with AWWA Standard C-502 and shall be of uniform make and model within any one (1) permitted project.

10-2.5.2 Specifications: Fire hydrants shall be of the compression type, opening against the pressure and closing with the line pressure with a five and one-quarter (5-1/4) inch minimum valve opening. Hydrant drains shall not be permitted.

10-2.5.3 Spacing and Flow Requirements: Fire hydrant spacing and flow requirements shall conform to the latest requirements of the Broward County Fire Marshall standards, plus the requirements of any local fire department having jurisdiction.

10-2.6 Air Release Valves

10-2.6.1 Type: Air release valves shall be of a type having a special float enclosed in the valve body with attached lever for opening and closing the air discharge port. Access to the ball float and interior discharge vent seat shall be provided by means of a bolted flange. Valves shall be as made by Val Matic or approved equal.

10-2.6.2 Design of the Float and Lever: The design of the float and level shall be such as to ensure opening of valve port under one-hundred-fifty (150) p.s.i. working pressure. The assembly shall not leak, nor shall the valve stick under service conditions.

10-2.7 Fire Wells: Fire wells shall be as specified by the Broward County Fire Protection Division, or by the Municipal Fire Department having jurisdiction, and shall be of breakaway design if located in a clear zone.

10-2.8 Service Saddles: Service saddles shall be ductile iron or bronze conforming to ASTM Standard A-536, with double straps (stainless steel in corrosive environment) which tighten to conform to the pipe and shall have an O-ring gasket seal around the tap, set in a retaining groove, to provide a watertight seal under pressure.

10-3 INSTALLATION: The installation and testing of all new water mains shall be in accordance with ANSI/AWWA Standard C-600 and the provisions of this document.

10-3.1 Location

10-3.1.1 Water Mains: Water mains shall be installed in public right-of-way or utility easements ONLY, and shall be installed in accordance with Drawings 1 through 4 in Appendix A, unless changed by reason of interference with existing utilities, the platting of half-streets, or other valid cause. The separation, encasement and other factors concerning the placing of water and sanitary sewer facilities in the same public right-of-way, shall be addressed in accordance with the applicable Standards of all agencies having jurisdiction.

10-3.1.2 *Valves*: All valves for water mains shall be located next to the tee or cross at intersecting streets, except where the use of a valve is required at a location not in a street intersection. The stems of all buried valves shall be not less than four (4) inches, or more than twelve (12) inches, below the finished grade unless otherwise approved. Valve stem extensions shall be used to bring the operating nut within twelve (12) inches of finished grade.

10-3.1.3 *Meter Boxes*: Boxes for meters up to two (2) inches in size may be located in public right-of-way near the property line. Boxes so located shall be of a traffic bearing type unless otherwise approved, and shall be set flush with the surrounding surface.

Boxes for meters over two (2) inches in size shall require Highway Construction and Engineering Division approval for locations within public right-of-way.

10-3.1.4 *Taps (Main to Main)*: The maximum and minimum tap sizes for water mains, unless otherwise authorized by the Highway Construction and Engineering Division, shall be as follows:

Pipe Size	Minimum Tap Size	Maximum Tap Size
8"	6"	same size as main
10" through 16"	6"	same size as main
18" through 20"	12"	same size as main
36"	20"	same size as main
42" and larger	20"	same size as main

Notes: Same size taps are not allowed on asbestos cement pipe. Tapping values four (4) inches to six (6) inches shall comply with AWWA Standard C-509, latest revision.

10-3.1.5 *Service Laterals*

10-3.1.5.1 All service laterals which shall be located under pavement shall be installed or stubbed out from under the pavement during installation of the main or shall be driven under the existing pavement at a later date.

10-3.1.5.2 Service laterals requiring open cuts into existing pavement after installation of the main shall require separate permits and security, and shall be avoided if possible.

10-3.1.6 *Fire Hydrants*

10-3.1.6.1 The location and installation of fire hydrants shall be in accordance with Fire Protection Division standards or the requirements of the local Fire Department having jurisdiction. Hydrant guards shall not be installed within the "clear zone" of any County road.

10-3.1.6.2 Fire hydrants shall be painted with reflective type paint in accordance with NFPA Standard #291 or per the latest requirements of the Broward County Fire Marshall or any local fire department having jurisdiction.

10-3.1.6.3 A blue raised reflective pavement marker shall be used to identify the fire hydrant location. The placement of the reflector to be at the center line of the outside roadway lane, unless otherwise directed by the Fire Marshall or the local fire department having jurisdiction.

10-3.1.7 *Valve Boxes:* All valve boxes installed in landscaped or grassed areas shall have a twenty-four (24) inch x twenty-four (24) inch x eight (8) inch thick poured concrete support collar set even with the surrounding finished surface.

10-3.1.8 *Air Release Valves:* Air release valves shall be installed at high points in the line as shown on approved plans or as designated by the Engineer of Record, to purge air and other gases from the line while under pressure.

10-3.2 Cover

10-3.2.1 *Mains:* The minimum cover on all water mains shall be thirty-six (36) inches (thirty (30) inches for DIP). The top of the operating nut shall have a minimum cover of thirty (30) inches to allow for stabilization of road subgrade. A greater cover may be necessary to insure that the operating nuts of valves shall have clearance below the bottom of the valve box cover. The elevations of sanitary sewer house connections shall be considered in determining water main cover.

10-3.2.2 *Service Laterals:* Service laterals under present or future pavements shall have a minimum cover of thirty (30) inches. If cover is less than thirty-six (36) inches, an approved casing shall be used.

10-3.3 *Construction Procedures and Installation of Facilities:* Construction procedures, restorations and installations shall be in accordance with the provisions of Chapter 3 of this document. Pipe detection material, if used, shall meet the requirements of Chapter 3, Section 3-4.6 and shall be placed directly over and one (1) foot above the crown of the pipe.

10-4 TESTING OF INSTALLATIONS

10-4.1 *Standards:* Water mains shall be tested in accordance with ANSI/AWWA Standard C-600 with a minimum test pressure of one-hundred-fifty (150) p.s.i. A gauge supplied by the operating utility or the Highway Construction and Engineering Division shall be used on all testing.

10-4.2 *Representation:* The Highway Construction and Engineering Division, the Operating Utility, and the Engineer of Record shall all be represented at all tests of water lines in public right-of-way and/or public easements. The Engineer of Record shall certify all test results to the Highway Construction and Engineering Division. A representative of the Highway Construction and Engineering Division shall witness the conduct of the test and the results thereof, and shall indicate concurrence by countersigning the test report at the conclusion of the test. In the event that the Highway Construction and Engineering Division fails to witness a properly scheduled test, the certification of the Engineer of Record shall be accepted.

10-5 DISINFECTION

10-5.1 Standards: Water mains shall be disinfected in accordance with ANSI/AWWA Standard C-651.

10-5.2 Hydrostatic and Bacteriological Testing: Mains shall not be placed into domestic service until after satisfactory hydrostatic and necessary bacteriological testing has been completed, and clearance granted by the Broward County Public Health Department and all other applicable agencies.

10-6 CERTIFICATIONS AND RECORD DRAWINGS

10-6.1 Certification: The Engineer of Record on each project shall be responsible for observation of construction and shall inspect same for conformity to the approved plans and specification. Upon completion of the project, the Engineer of Record shall furnish the required project documents, signed and sealed, to the Highway Construction and Engineering Division, the Broward County Public Health Department and to any other agencies so requiring, certifying that construction of the project has been carried out in substantial conformance with the approved plans and specifications.

10-6.2 Record Drawings: Prior to final inspection, the Engineer of Record shall furnish one (1) set of certified record drawings signed and sealed by both the Engineer of Record and a Professional Surveyor and Mapper, to the Highway Construction and Engineering Division at no charge. In every case, when the design drawings have been produced using a CAD system, the "as-built" or record drawings shall also be produced on the CAD and the Engineer of Record shall also submit a copy of the magnetic medium containing the information from which the as-built drawings were produced.

10-6.3 House Connections: Accurate house connection dimensions shall be shown on the plans. Main and terminal point locations, elevations of stubs or laterals, and locations and elevations of all changes in direction and slope shall also be shown.

10-6.4 Drawing Submittals: The drawings submitted under the preceding paragraph shall bear the certification of the Engineer of Record that the installation conforms substantially to the design, has passed all required tests, and that the inspection of the installation during construction was conducted under the supervision of a representative of, or the Engineer of Record. All required reports and certifications must be received by the Highway Construction and Engineering Division prior to final inspection.

10-6.5 Underground Utilities Encountered During Construction: In addition to the above requirements, record drawings shall indicate the size, material, location and elevation of all underground utilities encountered during construction.

10-6.6 Professional Surveyor and Mapper (PSM) Certification: All locative information and dimensions shall be certified by a Professional Surveyor and Mapper registered in the State of Florida.

10-7 SERVICE CONNECTIONS: Service connections shall not be made until the entire installation has been tested and accepted by the operating utility, the Highway Construction and Engineering Division, the Broward County Public Health Department, and all other agencies having jurisdiction.

10-8 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 of this document shall apply.

10-9 CONFLICT STRUCTURES: Conflict maintenance access structures shall be approved on an individual basis by the appropriate regulatory and maintaining agencies and by the Highway Construction and Engineering Division. In no case may a water line pass through or come in contact with a sanitary sewer maintenance access structure. This shall include field changes as well as initial design.

Conflict maintenance access structures shall conform to the requirements of Chapter 10, Section 10-9 and Drawing 21 in Appendix A.

CHAPTER 11 – SEWAGE COLLECTION SYSTEMS - TECHNICAL REQUIREMENTS

11-1 STANDARDS: All sewage collection systems in public right-of-way shall be in accordance with the following Standards, specifications and regulations, except as modified by these Standards. All installations shall be in accordance with the Manufacturer's recommendations, except where these standards are more stringent.

- Broward County Public Health Department (BCPHD)
- Florida Department of Health
- Florida Department of Environmental Protection
- Broward County Environmental Protection Department
- Broward County Building and Zoning, and other agencies (as applicable)
- American Water Works Association (AWWA)
- FDOT "Utility Accommodation Manual"
- American National Standards Institute (ANSI)
- American Society for Testing Materials (ASTM)
- Recommended Standards for Wastewater Facilities
- Broward County Water and Wastewater Operations Division (WWOD)
"Minimum Design and Construction Standards"

11-2 MATERIALS: All pressure pipe, pipe fittings and specials intended for sewage collection or transmission mains shall be designed for a minimum working pressure of one-hundred-fifty (150) p.s.i.

11-2.1 Pipe: All main piping shall be ductile iron or PVC. Flow characteristics shall govern the sizes of pipe, except that the minimum size to be used shall be eight (8) inches.

11-2.1.1 Ductile Iron Pipe: Ductile iron pipe shall conform to ANSI/AWWA Standard C-151/A21.51 "Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds" and C-150/A21.50, "Thickness Design of Ductile Iron Pipe." For new systems or extensions to existing systems, Ductile Iron Pipe shall conform with pressure classification 350 for sizes six (6) inches through twenty-four (24) inches, and pressure classification 250 for sizes above twenty-four (24) inches.

Ductile iron pipe shall be poly-lined or, with Highway Construction and Engineering Division approval, coated with the manufacturer's coating system. The pipe shall be adapted for use with Class 350 fittings through twenty-four (24) inches, and with Class 250 fittings for sizes over twenty-four (24) inches.

11-2.1.2 PVC Pipe: PVC non-pressure pipe shall conform to ASTM D-3034 (SDR 26).

11-2.1.3 Asbestos Cement / Vitrified Clay Pipe: Use of asbestos cement or vitrified clay pipe shall not be permitted on new construction. Repairs to existing pipes of this material shall be subject to approval by the Highway Construction and Engineering Division.

Where roads are to be built, widened or rebuilt, existing asbestos cement pipe under areas to be paved shall be de-activated and removed. If removal and disposal is not practical, the alternative method of flushing and filling the pipe with grout may be used, if approved by the Highway Construction and Engineering Division.

11-2.2 Fittings

11-2.2.1 Ductile Iron Fittings: The provisions of Chapter 10, Section 10-2.2.1 shall apply.

11-2.2.2 PVC Fittings: PVC fittings shall be of monolithic or factory fabricated (solvent weld) construction in accordance with ASTM D-3034 and of the type specified by the manufacturer of the pipe being used. No non-factory solvent welds or threaded joints shall be permitted. SDR 26 fittings shall be used.

11-2.3 Joints

11-2.3.1 Ductile Iron Pipe Joints: Joints for bell and spigot ductile iron pipe and fittings shall conform to ANSI/AWWA Standard C-111/A21.11. Mechanical joints or push-on joints to be rubber gasket compression-type. Special fittings and joints shall be considered for specific installations subject to the approval of the Engineer of Record.

11-2.3.2 PVC Pipe Joints: Joints for PVC non-pressure pipe shall be bell and spigot push-on rubber gasket type only. No solvent weld or threaded joints shall be permitted.

11-2.3.3 Pipe Certification: The pipe manufacturer shall furnish evidence in the form of affidavits, certified laboratory reports and other data as may be required that the material being used in the manufacture of the seal or gasket is in strict accordance with the material supplier's recommendations.

11-2.3.4 Jointing of Pipe on the Job: The jointing of the pipe on the job shall be done in strict accordance with the pipe manufacturer's instructions and shall be done entirely in the trench unless otherwise directed by the Engineer of Record.

11-2.4 Maintenance Access Structures

11-2.4.1 Precast Concrete Maintenance Access Structures: Precast reinforced concrete maintenance access structures shall conform to the requirements of ASTM C-478 and the following modifications thereto:

11-2.4.1.1 Minimum wall thickness shall be eight (8) inches.

11-2.4.1.2 Minimum inside diameter of base sections shall be four (4) feet.

11-2.4.1.3 The pre-cast reinforced base shall be a minimum of eight (8) inches thick and be cast monolithically with the bottom section of the walls.

11-2.4.1.4 The minimum height of base sections shall be three (3) feet from the bottom of base slab except that under special conditions, the height may be decreased to eighteen (18) inches, contingent upon prior approval of the Highway Construction and Engineering Division.

11-2.4.1.5 Brick for maintenance access structure chimney construction shall be dense, hard burned, common clay brick conforming to ASTM C-62 latest revision, except that brick absorption shall be between five (5) and twenty-five (25) grams of water absorbed in one (1) minute by dried brick, set flat face down, in one-eighth (1/8) inch of water. All brick shall be thoroughly wet before laying up and shall be laid with a shove joint in full mortar beds and shall be thoroughly slushed up with mortar at every course. Brick shall be a minimum of two (2) courses and a maximum of four (4) courses.

Concrete adjustment rings, two (2) rings minimum and four (4) rings maximum, shall be considered as an alternative to brick and mortar with approval of the Highway Construction and Engineering Division.

11-2.4.1.6 The lid and frame shall be cast of close ground grey iron conforming to ASTM A48 and shall be of uniform quality, free of blow holes, porosity, cracks and other obvious visual defects. The combined weight of the frame and lid shall not be less than 525 pounds, and the lid shall weigh a minimum of 160 pounds. The seating surfaces between frames and covers shall be machined to fit true. No plugging or filling shall be allowed. Casting patterns shall conform to those designated by the operating utility and shall have the words "sanitary sewer" cast in all maintenance access structure covers.

11-2.4.1.7 When a maintenance access structure is in low lying areas or when in the opinion of the Highway Construction and Engineering Division, an unusual condition exists, a sealed locking type lid may be required. Installations of this type shall be carried out as approved by the Highway Construction and Engineering Division.

11-2.4.1.8 All concrete used in maintenance access structure construction shall have Type 2 cement exclusively.

11-2.4.2 *Brick Maintenance Access Structures:* Brick maintenance access structures are not permitted.

11-2.5 *Service Laterals:* All service laterals shall be ductile iron or PVC meeting the requirements of Section 11-2.1 of this Chapter.

11-3 INSTALLATION: The jointing of the pipe on the job shall be done in strict accordance with the pipe manufacturer's instructions and shall be done entirely in the trench unless otherwise directed by the Engineer of Record.

All sewer installations shall be in accordance with the provisions of this Chapter and Chapter 3 of this document.

11-3.1 Mains

11-3.1.1 Location: Gravity sewer mains shall be installed at the centerline of the right-of-way unless otherwise approved by the Highway Construction and Engineering Division.

11-3.1.2 Alignment: Gravity sewer mains, as installed, shall meet the alignment requirements of ASTM Standard C-12 and those of the Environmental Planning Department.

11-3.1.3 Cover: The minimum cover on all sanitary sewer mains shall be thirty (30) inches for ductile iron pipe and thirty-six (36) inches for PVC pipe. The slope and depth of house connections shall be considered in determining sewer main cover.

11-3.1.4 Termination Points: All main runs shall begin and end at maintenance access structures.

11-3.2 Service Laterals

11-3.2.1 Location: Service laterals shall be installed along the lot line extension of each platted lot, whenever possible, at the time of main installation, and shall be terminated at the property line or as close thereto as is practical for each residence or business location.

11-3.2.2 Clean-outs: Each service lateral shall include an approved clean-out section at the property line and shall terminate with a capped wye fitting for future house connections.

11-3.2.3 Minimum Size: The minimum size for any service lateral shall be six (6) inches and the minimum depth at the right-of-way line shall be thirty-six (36) inches, unless otherwise approved by the Highway Construction and Engineering Division.

The minimum depth for ductile iron service laterals at the right-of-way line shall be thirty (30) inches, unless otherwise approved by the Highway Construction and Engineering Division.

11-3.2.4 Pavement Cuts: Service laterals requiring cuts into the pavement after installation of the main and paving of the roadway, shall require separate permits, permit fees and security, and are to be avoided, if possible.

11-3.2.5 Stubs: Service laterals may not be stubbed into maintenance access structures.

11-3.2.6 Detection Markers: Locations of all non-metallic lines shall be permanently marked with electro magnetic detection markers or other approved means at all service lateral taps, wyes and house connections.

11-3.3 Maintenance Access Structures

11-3.3.1 Pre-cast Sections: All precast maintenance access structure sections, as delivered to the job-site, shall be un-patched and shall bear the stamp of a certified Engineering Testing Laboratory, signed and dated, certifying that the sections meet the requirements of ASTM Standard C-478, and of this document for concrete strength, steel reinforcement area and placement, and appearance when manufactured. All maintenance access structure sections shall be subject to inspection at the job-site by the Highway Construction and Engineering Division Inspector to verify conformity with requirements of ASTM C-478 and this document.

11-3.3.2 Adapter Couplings: Approved flexible adapter couplings are required for connecting pipe to maintenance access structures.

11-3.3.3 Lifting Holes and Rings: Lifting holes through the structures shall not be permitted. Lift rings shall meet the OSHA requirements, and be removed from structure sections immediately upon installation.

11-3.3.4 Joining of Sections: Maintenance access structure sections shall be joined with a mastic compound or a round compression ring of neoprene material set in annular spaces cast into the spigot end of a bell and spigot type joint. The mastic compound or ring shall be uniformly compressed between the positioned sections so as to form a watertight joint. After the sections are assembled, the remaining space in the joint shall be pointed up and filled with dense cement mortar and finished so as to make a smooth, continuous surface inside and outside the wall sections.

11-3.3.5 Deep Structures: Deep structures may have an eight (8) inch precast reinforced concrete slab on the top in lieu of the cone sections. Slabs shall have a twenty-four (24) inch minimum diameter access hole centered in the slab, or located as directed by the Highway Construction and Engineering Division. Slabs, if used, shall terminate at such elevations as shall permit laying up a minimum of two (2) courses of clay brick, a maximum of four (4) courses of brick under the structure's frame to make allowance for future street grade adjustments and/or settlement.

Concrete adjustment rings, two (2) rings minimum and four (4) rings maximum, shall be considered as an alternative to brick and mortar with approval of the Highway Construction and Engineering Division.

11-3.3.6 Precast Cones: Precast cones, if used, shall terminate at such elevations as shall permit laying up a minimum of two (2) courses and maximum of four (4) courses of clay brick under the structure's frame to make allowance for future street adjustment and/or settlement.

Concrete adjustment rings, two (2) rings minimum and four (4) rings maximum, shall be considered as an alternative to brick and mortar with approval of the Highway Construction and Engineering Division.

11-3.3.7 Invert Channels: The invert channels shall be of solid cement mortar and shall be smooth and accurately finished to a semicircular shape conforming to the

inside of the adjacent sewer pipe section. Steep slopes outside the invert channels shall be avoided. Changes in the size and grade shall be made gradually and evenly. Changes in the direction of the shaped sewer inverts within the structure shall be a smooth curve with a radius as long as practicable.

11-3.3.8 Drop Connections: Drop connections shall be required when the vertical distance between inlet and outlet inverts exceeds two (2) feet. Outside drops are preferred, but inside drops shall be allowed, if approved by the utility. Outside drop connection bases shall be cast monolithically with the structure's base. All drop connections shall meet the requirements of the "Recommended Standards for Wastewater Facilities."

11-3.3.9 Steps or Ladders: Steps or ladders shall be omitted unless specifically requested by the Engineer of Record.

11-3.3.10 Stub-outs: Where shown on the drawings, the permittee shall place stub-outs for future extensions. Such stub-outs shall be closed with plugs as specified by the Engineer of Record.

11-3.3.11 Protective Coating: Two (2) coats (a minimum thickness of six (6) mils of approved protective material) shall be applied to the entire outside and inside surface of the structure at the job-site, after inspection. This material shall be applied in accordance with the manufacturer's specifications. The coats shall have contrasting colors so as to be easily verified. The outside of the structure shall be coated prior to being placed in the ground, and the inside shall be coated after final inspection.

11-3.3.12 Protective Liners: If required by the Highway Construction and Engineering Division protective liners shall be installed inside the structure in lieu of interior protective coating.

11-4 TESTING OF FACILITIES

11-4.1 Representation: The Highway Construction and Engineering Division, the operating utility, and the Engineer of Record shall all be represented at all tests of sewer lines in public right-of-way, and/or public easements.

The Engineer of Record shall certify all test results to the County. The Highway Construction and Engineering Division representative shall indicate concurrence with the test results by countersigning the test report at the conclusion of the test. In the event that the Highway Construction and Engineering Division determine that it does not need to be present for the test, the certification of the Engineer of Record shall be accepted.

11-4.2 Infiltration – Exfiltration Tests

11-4.2.1 Allowable Limits: The allowable limits of infiltration or exfiltration for the entire system, or any portion thereof, shall not exceed a rate of 100 gallons per inch of inside pipe diameter per mile of pipe per twenty-four (24) hours. No additional allowance shall be made for house service lines. The allowable limits of infiltration or exfiltration at maintenance access structures shall not exceed a rate

of four (4) gallons per structure per twenty-four (24) hours. No leakage allowance shall be made for service laterals on infiltration or exfiltration tests.

11-4.2.2 Testing Requirements: The entire system shall be tested for infiltration or exfiltration, except as directed by the Highway Construction and Engineering Division. Prior to testing for infiltration, the system shall be filled and then pumped out so that normal infiltration conditions exist at the time of testing.

11-4.2.3 Determination of Infiltration or Exfiltration Amounts: The amounts of infiltration or exfiltration shall be determined by the use of weirs or by pumping into or out of calibrated containers.

11-4.2.4 Testing Method: The exfiltration test shall be conducted by filling the portion of the system being tested with water to a level equal to the lowest part of the lowest structure's frame. Air testing shall be considered as an alternative test method with approval by the Highway Construction and Engineering Division.

11-4.2.5 Testing Length: Tests shall be conducted on portions of the system not to exceed three (3) maintenance access structure sections or twelve-hundred (1200) feet, whichever is greater, unless otherwise directed by the Highway Construction and Engineering Division. Tests shall be run continuously for two (2) hours.

11-4.2.6 Defective Construction: Where infiltration or exfiltration exceeds the allowable limits specified herein, the defective pipe, joints or other faulty construction shall be located and repaired by the permittee. If the defective portions cannot be located, the permittee shall remove and reconstruct as much of the system as is necessary in order to conform to the specified allowable limits.

11-4.2.7 Testing Equipment and Materials: The permittee shall, at no expense to the County, provide all labor, equipment and materials and shall conduct all testing required in the presence of, a representative of, or the Engineer of Record, and a representative of the Highway Construction and Engineering Division. Infiltration tests shall be run on all sections of the sewer mains where the ground water level is two (2) feet or more above the top of the sewer pipe. All other sections of the installation, including service laterals, shall be tested for exfiltration. All maintenance access structures shall be tested for infiltration or exfiltration.

11-4.3 Mandrel Testing of Lines: At the discretion of the Highway Construction and Engineering Division Inspector, and using the Highway Construction and Engineering Division Deflection Test Gauge, the permittee shall test designated lines for excessive deflection. The deflection gauge is sized to pass through a pipe with no more than 5% reduction in diameter due to manufacturing and installation imperfections. Any line through which the gauge shall not pass shall not be accepted until the line is corrected sufficiently to allow the test gauge to pass. The permittee may use a Deflection Test Gauge furnished by others after cross checking said gauge with the Highway Construction and Engineering Division gauge for dimensional consistency.

11-4.4 Visual and Television Inspection: On completion of each block or section of sewer, or at such other times as the Engineer of Record may direct, the block or section of sewer is to be cleaned, tested and inspected. Each section of the sewer is

to show, on examination from either end, a full circle of light between maintenance access structures. The portion of the system being inspected shall be water tight and neatly constructed, with the maintenance access structure tops set permanently to exact position and grade. All defects disclosed by the inspection are to be corrected. Broken or cracked pipes are to be replaced, all deposits removed and the sewers left true to line and grade, entirely clean and ready for use. After all other testing has been successfully completed, a television inspection of any or all lines shall be made upon the request of the operating utility, and at the expense of the operating utility. Any defect disclosed during this inspection shall be corrected by, and at the expense of the permittee before the lines shall be accepted by the Highway Construction and Engineering Division.

11-5 CERTIFICATION AND RECORD DRAWINGS: The requirements of Chapter 10, Section 10-6, of this document shall apply, in addition to the following provision:

11-5.1 Record Drawings: The record drawings shall also contain all the locations, rim elevations, invert elevations and structure numbers of all sanitary sewer structures in a format in accordance with Highway Construction and Engineering Division requirements.

11-6 HOUSE CONNECTIONS: House connections shall not be made until the entire downstream system has been tested and accepted by the operating utility, the Highway Construction and Engineering Division, the Environmental Protection Department, and all other agencies having jurisdiction.

11-7 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 shall apply.

11-8 CONFLICT STRUCTURES: Conflict maintenance access structures involving sanitary sewers are to be avoided, if possible. Under extreme conditions, with the written permission of the Highway Construction and Engineering Division and the approval of all other bodies having jurisdiction, they may be employed, but shall conform to the requirements of Chapter 10, Section 10-9 and Drawing 21 in Appendix A.

CHAPTER 12 – SEWAGE FORCE MAINS - TECHNICAL REQUIREMENTS

12-1 STANDARDS: The provisions of Chapter 11, Section 11-1 shall apply.

12-2 MATERIALS

12-2.1 Pipe, Pipe Fittings, Specials and Valves: All pipe, pipe fittings, specials, and valves intended for conveying or transmitting of raw sewage under pressure shall conform to the requirements for water mains as set forth in Chapter 10, Section 10-2, except as hereinafter provided. All materials shall be new and unused.

12-2.1.1 Minimum Pipe Size: The minimum pipe size for any force main shall be six (6) inches unless otherwise approved by the Highway Construction and Engineering Division. Such approval shall be on a case-by-case basis.

12-2.1.2 Ductile Iron Pipe and Fittings: Ductile iron pipe and fittings shall be poly-lined or shall be coated with the manufacturer's coating system. Either alternative shall require Highway Construction and Engineering Division approval prior to construction. Cement mortar lining is not acceptable for force mains.

12-2.2 Air Release Valves: Sewage air release valves shall be specifically designed for use on sewage force mains. Bodies and covers shall be cast iron, trim and float shall be stainless steel and the outlet shall be one-half (½) inch, N.P.T. Valves shall automatically release air, gas or vapor under pressure during system operation.

12-2.3 Plug Valves: Plug Valves shall be non-lubricated, eccentric type with resilient-faced plugs, and shall have permanently lubricated stainless steel bearings. Valve bodies shall be semi-steel with raised seats, bolted bonnets and adjustable packing. Valves shall be designed to permit re-packing without removing the bonnet and shall be operable in either direction of flow.

Valves over twelve (12) inches in diameter shall have worm gear operators.

12-2.4 Tapping Sleeves and Valves: Tapping sleeves shall conform to MSS Standard SP-60. All gaskets shall be neoprene, "O"-ring type. Gasket restraint provisions shall be incorporated into the body of the sleeve. A test plug shall be provided at the outlet throat.

12-2.4.1 Tapping gate valves six (6) inches through twelve (12) inches shall comply with ANSI/AWWA Standard C-500 or C-509. The valve port shall be free and full to allow unobstructed passage of the portion of the pipe wall cut out during the tap.

12-2.4.2 Valves sixteen (16) inches and larger shall be furnished with a by-pass valve.

12-2.4.3 Gate valves six (6) inches through twelve (12) inches shall have a minimum working pressure of two-hundred (200) p.s.i., and be tested at four-hundred (400) p.s.i. Valves sixteen (16) inches through forty-eight (48) inches shall

have a minimum working pressure of one-hundred-fifty (150) p.s.i. and be tested at three-hundred (300) p.s.i.

12-2.5 Valve Boxes: The provisions of Chapter 10, Section 10-2.4.9 shall apply.

12-3 INSTALLATION

12-3.1 Requirements: The installation of all new sewage force mains or modifications to existing force mains shall be in accordance with the requirements for water mains, Chapter 10, Section 10-3, as applicable, except as hereinafter provided.

12-3.2 Location: Sewage force mains installed within public right-of-way shall be located as shown on Drawings 7 through 10 in Appendix A, unless otherwise approved.

12-3.3 Lift Station Locations: Lift stations shall not be located in public right-of-way except as a last option, and only with Highway Construction and Engineering Division approval.

12-4 HYDROSTATIC TESTING

12-4.1 Standards: Force mains shall be tested in accordance with AWWA Standard C-600, and the provisions of Chapter 10 of this document. The minimum pressure for testing shall be one-hundred-fifty (150) p.s.i.

12-4.2 Service Connections: Service connections shall not be made until the entire installation has been tested and accepted by the operating utility, the Highway Construction and Engineering Division, the Environmental Control Board, Environmental Protection Department, and all bodies having jurisdiction, and all required documents have been submitted to and accepted by all bodies having jurisdiction.

12-5 CLEANING AND FLUSHING: Sewage force mains shall be cleaned and flushed after completion of testing, with sufficient clean water to displace all test water and to remove all sand, mud or other deposits. If necessary, other approved methods shall be used to ensure the removal of all such deposits.

12-6 CERTIFICATIONS AND RECORD DRAWINGS: The provisions of Chapter 10, Section 10-6 shall apply.

The provisions of Chapter 3, Section 3-4.3 shall apply.

12-7 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 shall apply.

12-8 CONFLICT STRUCTURES: Conflict maintenance access structures involving sewage force mains are to be avoided (see Chapter 10, Section 10-9).

CHAPTER 13 – GENERAL REQUIREMENTS FOR GAS TRANSMISSION AND DISTRIBUTION, TELECOMMUNICATIONS, TELEPHONE, CABLE TV, FIBER OPTIC CABLE, ALL SIGNAL SYSTEMS AND ELECTRIC POWER INSTALLATIONS

13-1 PERMITS

13-1.1 Requirements: Permits for construction of all facilities, the revision thereto, including extensions and the maintenance thereof, shall be granted only after the following requirements have been completed:

13-1.1.1 Paving and Drainage Plan Approval: Paving and drainage plans for the area, if applicable, have been approved by the Highway Construction and Engineering Division.

13-1.1.2 Utility Plan Approval: Construction plans for utility installation have been approved by the Highway Construction and Engineering Division.

13-1.1.3 Provisions of Chapters 1 through 4: The applicable provisions of Chapters 1 through 4 of this document have been met.

13-1.2 Aerial Installations

13-1.2.1 New Construction: The construction of all new aerial, or other related facilities in existing or proposed County right-of-way shall not commence without a permit for same having been issued by the Highway Construction and Engineering Division, except as provided in Chapter 3, Sections 3-2.1, 3-2.2 and 3-2.3, and Sections 13-1.2.2 and 13-1.4 of this document. See Chapter 3, Section 3-3 for notification requirements.

13-1.2.2 Existing Facilities (Maintenance Work): The repair, replacement, relocation or removal of existing aerial, or other related facilities including poles and guys, in County right-of-way, not requiring excavation in or within five (5) feet of any roadway may be performed without a Broward County Permit, but in every case, the work-site shall be safely established in accordance with OSHA and MUTCD requirements during the entire period of such operations. See Chapter 3, Section 3-3 for notification requirements.

13-1.3 Underground Installations

13-1.3.1 New Construction: The construction of all new underground facilities, in existing or proposed County right-of-way, shall not commence without a permit from the Highway Construction and Engineering Division except as provided in Section 13-1.2.2 above; Sections 13-1.4 and 13-1.5 below; and Chapter 3, Sections 3-2.1, 3-2.2 and 3-2.3, of this document. See Chapter 3, Section 3-3 for notification requirements.

13-1.3.2 Existing Facilities (Maintenance Work): The repair, replacement, relocation or removal of existing underground facilities in public right-of-way, not requiring excavation in or within five (5) feet of any roadway may be performed

without a permit but, in every case, the work-site shall be safely established in accordance with OSHA and MUTCD requirements during the entire period of such operation (see Chapter 3, Section 3-3 for notification requirements).

13-1.4 Exception to Permit Requirements: Work performed under the following circumstances may be performed without a permit from the Highway Construction and Engineering Division:

Maintenance work anywhere in public right-of-way, when such work is required on short notice due to imminent failure of a utility, shall be considered emergency work and the procedures outlined in Chapter 3, Section 3-2.3 shall be followed.

13-1.5 Installations in Easements: The construction, repair, replacement, relocation or removal of any utility installation in an easement dedicated to the public and adjacent to a public road under Broward County jurisdiction shall not require a Highway Construction and Engineering Division permit, but the work-site shall be safely established in accordance with all applicable OSHA and MUTCD requirements during the entire period of such operations.

13-2 PLANS AND SPECIFICATIONS

13-2.1 Plan Size: Four (4) sets of plans shall be submitted on white prints with blue or black lines. Plans shall be submitted on sheets no larger than 11" X 17" except when prearranged with the Highway Construction and Engineering Division. Small projects may be submitted on legal size paper, provided that scale requirements are met.

13-2.1.1 Drawings for Borings: When performing a bore, the drawing shall include a cross section (plan and profile) of the area to be bored, show and locate with dimensions all existing utilities and roadway facilities, and depict the new facility maintaining a minimum of twelve (12) inches of clearance from all existing utilities for the entire crossing.

13-2.2 Facilities: Plans shall show and locate by dimension the proposed project facilities and all existing and other planned facilities sufficiently to permit assessment of the compatibility of the work with the existing systems. All existing utilities that have been abandoned, but are still in the ground, shall be shown on the plans and labeled as "abandoned."

13-2.3 Specifications: Specifications for the proposed work shall be submitted with the plans, or a notation shall be made on the plans stating that all installations shall be in conformity with the "Minimum Standards."

13-2.4 Plan Layout: Any general area layout sheets shall be on a scale of 300' or less to the inch. Detailed plans shall be of a scale sufficient to show the proposed work and the right-of-way area clearly with 1"= 20' recommended. Sufficient information shall be shown on the permit drawing to allow for precise location in the field. Elevations shall be based on the National Geodetic Vertical Datum (NGVD).

13-2.5 Legends: All plans shall show suitable legends.

13-2.6 Existing Pavement Widths: Existing pavement widths shall be indicated by dimensions, notes and light shading and shall be located by dimensions within the right-of-way.

13-2.7 Existing Public Right-of-Way Widths: Existing public right-of-way widths shall be indicated by dimensions and notes.

13-2.8 Existing Sidewalk Widths: Existing sidewalk widths shall be indicated by dimensions and notes and shall be located by dimension from the edge of pavement and the right-of-way/property line.

13-2.9 Locations of Underground Utilities: When locations of underground utilities cannot be determined, this shall be so indicated by a note.

13-2.10 Street Names: All street names shall be shown.

13-2.11 Identity of Utility Company: The identity of the operating and maintaining utility shall be indicated on the plans.

13-2.12 Maintenance Work Requiring a Permit: For all maintenance work requiring a permit, a drawing indicating location, right-of-way layout, proposed work area and nature of the work shall be submitted to the Highway Construction and Engineering Division for approval and permitting.

13-2.13 Emergency Work: For emergency work, a record drawing shall be submitted to the Highway Construction and Engineering Division within ten (10) working days after the work is done, with the information thereon as per Section 13-2.12 above.

13-2.14 Plans Within Limits of Broward County Road Project: Plans that fall within the limits of any current or proposed Broward County Road Project or Neighborhood Improvement Project shall be submitted to the assigned Broward County Project Manager and the Consulting Engineer for review and approval prior to submittal for permitting. A letter of approval shall be submitted with the permit package.

13-2.15 Utilization of Public Right-of-Way: When public right-of-way is utilized during construction, the utility shall give the Highway Construction and Engineering Division twenty-four (24) hours advance notification of start of work.

13-3 RECORD DRAWINGS: The provisions of Chapter 3, Section 3-8.2 notwithstanding, the Highway Construction and Engineering Division shall not routinely require record drawings, but may require them on a case-by-case basis. Record drawings, when required, shall be submitted within three (3) weeks after completion of the work and shall include a statement, signed by the Engineering Supervisor of the utility company, certifying the accuracy of the "as-built" locations and elevations of the subject installation as shown on the drawings and further certifying that the permitted installation was done in substantial accordance with the approved drawings.

Record drawings shall show "as-built" locations of all mains, services, tees, valves, maintenance access structures, handholes, pull boxes, etc., changes of slope or

direction, and terminal points of the installation in a format in accordance with Highway Construction and Engineering Division requirements.

In every case, when the design drawings have been produced using CAD system, the "as-built" or record drawings shall also be produced on the CAD system and the Engineer of Record shall also submit a copy of the storage medium containing the information from which the "as- built" drawings were produced.

CHAPTER 14 – GAS TRANSMISSION AND DISTRIBUTION SYSTEMS - SPECIAL REQUIREMENTS

14-1 PERMITS: The provisions of Chapter 13, Section 13-1 shall apply.

14-2 FEE AND SECURITY REQUIREMENTS: The provisions of Chapters 1 through 4 shall apply.

14-3 PLANS AND SPECIFICATIONS

14-3.1 Chapter 13 Provisions: The provisions of Chapter 13, Section 13-2 shall apply.

14-3.2 Detailed Plans: The detailed plans shall show gas main sizes, approximate locations of valves, approximate locations of gas service connections and dimensioned offsets of gas mains from property lines.

14-3.3 Residential Gas Services: Residential gas services to be installed during the original installation of mains shall be indicated but need not have dimensioned locations on original plans. Plans for connections after installation of main(s) shall be noted and explained.

14-4 STANDARDS: All gas transmission and/or distribution systems constructed in public right-of-way shall be in accordance with the following standards, specifications and regulations. All installations shall be in accordance with the manufacturer's recommendations except as modified by these Standards.

- USDOT "Pipeline Safety Regulations"
- Florida Public Service Commission "Gas Transmission and Distribution Piping Systems"
- FHWA "Manual on Uniform Traffic Control Devices"
- FDOT "Utility Accommodation Guide"

14-5 MATERIALS: All gas piping and fittings shall be designed to meet the requirements of the above publications. All materials shall be new and unused.

14-6 INSTALLATION

14-6.1 Cover: The minimum cover on all gas lines and service laterals in public right-of-way shall be thirty-six (36) inches unless installed in approved sleeves, at a depth approved by the Highway Construction and Engineering Division.

14-6.2 Location: In general, gas mains shall be located as shown in Drawings 7 through 10 in Appendix A, unless otherwise approved by the Highway Construction and Engineering Division.

When carrier pipe is made of non-metallic material a locating tape shall be placed one (1) foot directly above it.

14-7 CONSTRUCTION PROCEDURES: Construction procedures shall be in accordance with the provisions of Chapter 3 of this document. Testing of facilities shall be in accordance with applicable requirements of the USDOT "Pipeline Safety Regulations" and Florida Public Service Commission regulations.

14-8 TESTING: All gas distribution facilities shall be tested in accordance with the applicable standards listed in Section 14-4 above, as well as any contract requirements. All tests shall be certified by the Engineer of Record, who shall provide copies to Highway Construction and Engineering Division, to meet completion documentation requirements. Testing of backfill material and compaction, and roadway restoration however, shall be as per Chapter 3, Sections 3-6.6 and 3-6.7, and Drawings 11, 12, 13 and 14 in Appendix A.

14-9 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 shall apply.

14-10 RECORD DRAWINGS: The provisions of Chapter 13, Section 13-3 shall apply.

CHAPTER 15 – INSTALLATION OF TELEPHONE, CABLE TV OR OTHER SIGNAL SYSTEMS

15-1 PERMITS: The provisions of Chapter 13, Section 13-1 shall apply.

15-2 FEE AND SECURITY REQUIREMENTS

15-2.1 Plan Submittal: Notwithstanding the requirements of Chapter 4, Section 4-1.1, plans submitted for approval need not be signed or sealed by an Engineer certified in the State of Florida, if prepared by the operating utility and may be submitted with the permit application. All other portions of Chapters 1 through 4 shall be met prior to issuance of a permit.

15-2.2 Fee and Security Requirements: No fees or security required shall be payable by any Telephone Service Corporation for work performed pursuant to this Chapter if work is performed by said corporation's own employees, but security shall be required if the work is performed by another entity.

15-3 PLANS AND SPECIFICATIONS

15-3.1 Chapter 13 Provisions: The provisions of Chapter 13, Section 13-2 shall apply.

15-3.2 Detailed Drawings: The detailed drawings shall show the number, size, service and location of all underground cables and conduits, the approximate locations of all valves, hydrants, poles, maintenance access structures and terminal boxes and the size, service and material of all other piping. All utility mains shall be located by dimensioned offsets from the right-of-way lines and by the elevations, as determined from the appropriate utility companies' "as-built" drawing records.

15-3.3 Service Drops: Service drops to be installed during the original installation of the common cable shall be indicated on the plans but need not have dimensioned locations.

15-4 STANDARDS: Telephone and cable television or other signal carrying systems constructed in public right-of-way shall be in accordance with the following standards and regulations, and in strict accordance with manufacturer's recommendations as modified by these Standards:

- National Electric Safety Code
- Federal Communications Commission Regulations
- FHWA "Manual on Uniform Traffic Control Devices"
- FDOT "Utility Accommodation Guide"

15-5 CONDUIT

15-5.1 Steel Conduit: Steel conduit shall be minimum Schedule 40, hot dip galvanized after threading, conforming to ANSI C-80.1.

15-5.2 PVC Conduit: PVC conduit shall conform to ASTM F512 with minimum wall thickness of Series DR-26.

15-6 INSTALLATION: The provisions of Chapters 1 through 4 of this document shall apply, in addition to the following requirements:

15-6.1 Method: Telephone, television or other signal carrying cable installed in an existing or planned paved area in any public right-of-way, shall be carried in approved steel, concrete or high density polyethylene conduit.

15-6.2 Cover: The minimum cover for any telephone, cable television or other signal carrying cable or conduit in any public right-of-way shall be thirty (30) inches. Traffic Engineering Division communications/interconnect cable/conduit shall be at a minimum of thirty-six (36) inches. There shall be a minimum of six (6) inches separation between Traffic Engineering Division communications/interconnect cable/conduit and all other types of utilities.

15-6.3 Location: In general, and where practicable, all underground signal carrying cable installations shall be in accordance with Drawings 7 through 10 in Appendix A.

15-7 TESTING: Testing of telephone, cable television or other signal carrying facilities, shall be to utility department requirements and certified by the Engineer of Record, who shall provide copies to the Highway Construction and Engineering Division. Testing of backfill and compaction, and right-of-way restoration shall be as per Chapter 3, Sections 3-6.6 and 3-6.7, and Drawings 11, 12, 13 and 14 in Appendix A.

15-8 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 shall apply.

15-9 RECORD DRAWINGS: The provisions of Chapter 13, Section 13-3 shall apply.

CHAPTER 16 – ELECTRIC POWER INSTALLATIONS

16-1 PERMITS: The provisions of Chapter 13-1 shall apply.

16-1.1 Installations in Easements: The provisions of Chapter 13-1.5 shall apply.

16-1.2 Exceptions to Permit Requirements: Work performed under the following circumstances may be performed without a permit from the Highway Construction and Engineering Division:

Maintenance work anywhere in public right-of-way, when such work is required on short notice due to imminent failure of a power cable, shall be considered emergency work and the procedures outlined in Chapter 3, Section 3-2.3 shall be followed.

16-2 FEE AND SECURITY REQUIREMENTS

16-2.1 Plan Submittal: Notwithstanding the requirements of Chapter 4, Section 4-1.1, plans submitted for approval need not be signed or sealed by an Engineer certified in the State of Florida, if prepared by the operating utility and may be submitted with the permit application. All applicable portions of Chapters 1 through 4 shall be met prior to issuance of any permit.

16-2.2 Fees or Security: No fees or security shall be payable by any Electric Service Corporation for work performed pursuant to this Chapter if work is performed by said corporation's own employees, but security shall be required if the work is performed by another entity.

16-3 PLANS AND SPECIFICATIONS: The provisions of Chapter 13, Section 13-2.3 shall apply.

16-3.1 Detailed Plans: The detailed plans shall show all proposed cable, conduit and duct sizes, maintenance access structures and pole locations, right-of-way lines and widths, all existing utilities and the dimensioned offsets of the proposed facilities from the right-of-way lines.

16-3.2 Aerial and Underground Service Lines: Aerial service lines shall be indicated but need not be dimensioned. Underground service lines shall be shown and located by dimension from the lot lines of the properties they are serving.

16-4 STANDARDS: All electric power system installations constructed in public right-of-way shall be in accordance with the applicable provisions of this document and the following standards and regulations:

- National Electric Safety Code
- State of Florida Public Service Commission Regulations
- FDOT "Utility Accommodation Guide"
- FDOT "Design Standards"

16-5 CONDUIT

16-5.1 Steel Conduit: Steel conduit shall be hot-dipped galvanized in accordance with ANSI Standard C-80.1.

16-5.2 PVC Conduit: PVC conduit shall meet or exceed the requirements ASTM F512.

16-5.3 Duct Banks: Duct banks in which conduits are vertically stacked shall be encased with a minimum three (3) inches envelope of 3000 PSI concrete.

Precast concrete duct banks shall be constructed with 5000 PSI concrete and shall have a minimum of two (2) inches cover over the conduit and the reinforcing steel.

16-6 INSTALLATIONS: The provisions of Chapters 1 through 4 of this document shall apply, in addition to the following requirements:

16-6.1 Cover: All underground electric power cable installed in any public right-of-way shall be carried in approved steel or plastic conduit, and shall have a minimum of thirty-six (36) inches cover, unless otherwise approved.

16-6.2 Location: In general, all underground electric power installations shall be located in accordance with Drawings 7 through 10 in Appendix A.

16-7 TESTING: Testing of electric power facilities shall be performed to applicable standards and certified by the Engineer of Record, who shall provide copies to the Highway Construction and Engineering Division. Testing of backfill and compaction and roadway restoration, however, shall be as per Chapter 3, Sections 3-6.6 and 3-6.7 and Drawings 11, 12, 13 and 14 in Appendix A.

16-8 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 shall apply.

16-9 RECORD DRAWINGS: The provisions of Chapter 13, Section 13-3 shall apply.

CHAPTER 17 – LANDSCAPE, IRRIGATION AND HANDSCAPE - SPECIAL REQUIREMENTS

17-1 PERMITS

17-1.1 New Construction: A permit shall be required for construction of irrigation, handscape or tree trimming in public right-of-way except as provided in Chapter 3, Sections 3-2.1, 3-2.2 and 3-2.3. Such permit shall be granted only after the following requirements (as applicable) have been met:

17-1.1.1 Subdivision Plats: A subdivision plat for the area under construction has been recorded in the Broward County Clerk's Office. This requirement shall not apply to the installation or maintenance of lines in or through areas already developed or within developed right-of-way, or right-of-way extending across undeveloped areas.

17-1.1.2 Paving and Drainage Plan Approval: Paving and drainage plans for this area have been approved by the Highway Construction and Engineering Division.

17-1.1.3 Plan and Specification Approval: Construction plans and specifications for the installation or modification of irrigation and/or landscaping have been approved by the Highway Construction and Engineering Division.

17-1.1.4 Beautification Agreement Approval: A Beautification Agreement for irrigation and/or planting has been approved by the County Commission and recorded in the public records. A requirement of the agreement is that at least 50% of the landscaping shall be native species.

To obtain a copy of the standard Beautification Agreement used by Broward County, contact the Highway Construction and Engineering Division.

17-1.2 Maintenance: A permit shall not be required for minor maintenance of irrigation, trimming of trees or shrubs, or for mowing of grass.

17-2 PERMIT FEES AND MAINTENANCE SECURITY: The separate fee and security amounts are to be computed in accordance with the provisions of Chapter 4, Section 4-3.

17-2.1 Irrigation Lines: No separate maintenance security shall be required to cover landscape irrigation lines installed prior to the installation of pavement in new subdivisions provided that a subdivision maintenance security is posted which clearly states that said irrigation lines are covered by the security.

17-2.2 Swale Irrigation: No maintenance security shall be required for swale irrigation abutting a one or two unit residence site provided that the installation is to be made by the owner of said site, or by a qualified Contractor hired by the owner.

17-3 PLANS AND SPECIFICATIONS: The provisions of Chapter 5, Section 5-3 shall apply.

CHAPTER 18 – LANDSCAPE PLANTING - TECHNICAL REQUIREMENTS

18-1 STANDARDS: Planting within public right-of-way shall be performed in accordance with the following documents except as modified hereinafter, and with the provisions of this Chapter:

- FDOT "Green Book"
- FDOT Roadway "Design Standards," Index 546
- Broward County "Land Development Code"
- Provisions of Chapters 1 through 4 of this document

18-2 MATERIALS

18-2.1 Plant Material: All plant material shall be Florida Grade No. 1 or better at time of planting, as set forth in the Florida Department of Agriculture "Grade Standards for Nursery Plants, Part 1," except as noted in the following:

18-2.1.1 Prohibited Trees: Street trees prohibited for planting in medians and public right-of-way:

- Schinus terebinthifolius/Brazilian Pepper
- Cassarina spp/Australian Pine
- Melaleuca spp/Cajeput, Punk Tree
- Ficus benjamina/Weeping Fig
- Ficus nitida/Cuban Laurel
- Ficus elastica/Rubber Tree
- Acacia ariculaeformis/Earleaf Acacia
- Bischofia javonica/Bishopwood
- Enterlobium cyclocarpum/Ear Tree

18-2.1.2 Plant Selection: Plant selection shall be appropriate to site conditions, i.e., soil, topography, geographic location, etc.

18-2.1.3 Xeriscape: Plant selection and installation should conform to Xeriscape principles in accordance with guidelines established by South Florida Water Management District.

18-2.1.4 Plant Conformance: Plant selection should conform to the following:

- South Florida Water Mgt. District "Xeriscape Principles and Guidelines"
- Florida Division of Forestry "Guidelines to South Florida Plants"
- Florida Power and Light "Plant the Right Tree in the Right Place"
- Broward County Ordinance No. 1999-07 "Preservation and Abuse"
- Broward County Zoning Code, Article VIII "Functional Landscaping and

Xeriscaping”

18-3 INSTALLATION

18-3.1 Landscape Development Features: Earth berming and other landscape development features may only be installed in public right-of-way where and as approved by the Highway Construction and Engineering Division, and may be removed to facilitate right-of-way construction.

18-3.2 Shrub and Ground Cover: Where not specifically addressed in the above referenced documents, shrub and ground cover which shall grow to an ultimate height (unpruned) exceeding twenty-four (24) inches, shall not be utilized in medians adjacent to left turn storage lanes, or thirty (30) inches ultimate height (unpruned) adjacent to the turn lanes transition (height shall be measured from the lowest adjacent edge of pavement to the top of the plant).

18-3.3 Areas within Clear Sight Corridor: For areas within the clear sight corridor, shrub and ground cover shall be designed, installed and maintained at a height, measured from the lowest adjacent edge of pavement to the top of the plant, not to exceed:

- Thirty (30) inches when adjacent to through travel lane
- Thirty (30) inches when adjacent to the turn lane transitions
- Twenty-four (24) inches when adjacent to the turn lanes storage portion

Trees, shrubs, etc., may be installed in medians adjacent to through lanes and left turn lane transitions where minimum clearances (vertical and horizontal) and spacing are provided according to the safety standards of FDOT and Broward County.

18-3.4 Plantings in Medians: No plantings, except grass, shall be allowed in medians six (6) feet or less in width.

18-3.5 Sight Distance: Plantings shall not restrict sight distance to less than that required by the standards of FDOT and Broward County. Proper sight distance shall be provided for drivers to execute all permitted movements at or approaching any “roadway/roadway” or “roadway/driveway” intersection.

18-3.6 Plantings that Obscure Signs or Restrict Access: Plantings shall not obscure street name signs, traffic related regulatory or informational signs, traffic signalization, school flashers or bus-stop-related signs or facilities. Plantings shall not restrict access to sidewalks, bike paths or mass transit facilities.

18-3.7 Trees near Exfiltration Trench: No tree may be installed closer to an exfiltration trench than the tree dripline or tree height, at maturity, whichever is greater.

18-3.8 Trees-Vertical Clearance: The minimum distance from roadway to tree overhang shall be at least sixteen (16) feet.

CHAPTER 19 – LANDSCAPE IRRIGATION - TECHNICAL REQUIREMENTS

19-1 STANDARDS: All landscape irrigation systems constructed in public right-of-way shall be in accordance with the American Water Works Association (AWWA) "Standards for Pressure Pipes," the American Society for Testing Materials (ASTM), the Florida Irrigation Society "Standards and Specifications for Turf and Landscape Irrigation" and the requirements of governmental agencies having jurisdiction, except as modified by the provisions of this document, and shall be installed in accordance with the manufacturer's recommendations.

19-2 MATERIALS

19-2.1 Irrigation Pipe: All irrigation pipe upstream of zone control valves shall be PVC conforming to ASTM Standard D-2241, D-1784, Type 1120 or 1220. Pressurized pipe two-and-one-half (2-½) inches and larger shall be Class 200, gasket type, with rubber rings that meet ASTM Standards D-1869 and F-477. All solvent weld main lines shall have, as a minimum, Schedule 40 thickness. All materials shall be new and unused.

Solvent weld joints may be used on main lines two-and-one-half (2-½) inches and three (3) inches in size, provided that the design criteria is such that the Surge Pressure, as calculated with the following formula, does not exceed the Burst Pressure:

$$P = .070 \frac{VL}{T} \text{ where:}$$

- P = Pressure rise (p.s.i.) above static pressure
- V = Velocity of flow (ft./sec.)
- L = Length of pipe (ft.) on pressure side of valve
- T = Closing time of valve (sec.)

19-2.2 Laterals: Laterals downstream of the zone control valves shall be PVC meeting ASTM Standard D-2241, Type 1120, SDR 26, Class 200, solvent weld type.

19-2.3 Fittings: All fittings for both pressurized and non-pressurized pipe shall be PVC, with minimum Schedule 40 thickness, meeting ASTM Standards D-2467 and D-2464 respectively.

19-2.4 Pipe Identification: All pipe and fittings shall bear the manufacturer's trademark name, material designation, applicable I.P.S., size, schedule and AWWA or N.S.F. seal of approval.

19-2.5 Minimum Working Pressure: All valves in public right-of-way shall have a minimum working pressure of one-hundred-and-fifty (150) p.s.i. and each shall conform to the AWWA Standard for its type.

Valve boxes and covers in public right-of-way shall be of traffic bearing design (capable of supporting an AASHTO H-20 loading).

19-2.6 Irrigation System Controls: All landscape irrigation systems shall be automatically controlled and have a rain or moisture sensor that shall override the irrigation cycle when adequate rainfall has occurred. All controls shall be of a normally closed type.

19-2.7 Back-flow Prevention: A back-flow prevention device shall be required when using a potable water supply and shall be installed per the requirements of the Broward County Board of Health and of the utility company to whose lines the irrigation system is to be connected.

19-2.8 Shut-off Devices: Shut-off devices shall be installed in each irrigation system, as follows, to protect roadways from undermining caused by main line piping rupture or by a vehicle running over the valve assembly and breaking the main line:

1. Main line pump stations shall have a main control valve with a sustaining pilot which shall limit flow to a preset amount.
2. Systems supplied by a City water system shall have a main control valve with a sustaining pilot, fixed flow plate and a normally closed solenoid pilot.
3. All systems shall have a low pressure shut-down feature to de-activate the pump station (for pump-supplied systems) or to close the solenoid valve (for city-water-supplied systems).
4. Control panels for all systems shall have a domed flashing warning light to indicate such shutdown.

19-3 INSTALLATION

19-3.1 Irrigation Pipes under Paved Areas: Irrigation pipes under paved areas shall be sleeved, shall have a minimum of thirty-six (36) inches cover and shall be installed in accordance with the provisions of Chapter 3, Section 3-4.5.

19-3.2 Minimum Cover and Location of Mains and Headers: All mains and headers in unpaved areas shall have a minimum of thirty (30) inches cover. Branches shall have a minimum of twelve (12) inches cover. Longitudinal lines should not be run within shoulder areas unless necessary. In uncurbed sections of roadway, sprinkler heads within five (5) feet of pavement shall contain a ground support flange or be provided with an approved flexible means of connection to the lateral pipe. Sprinkler heads shall be located so that they do not spray sidewalks.

19-3.3 Thrust Blocks/Joint Restraints: Thrust blocks shall not be permitted in public right-of-way. Permittee shall provide an acceptable type of joint restraint, such as Megalug, Flex-Ring, etc.

19-3.4 Electrical Requirements: All electrical installations shall meet or exceed the requirements of the National Electric Safety Code. All electrically operated valves shall be 24-volt (or less) actuated.

Low voltage wiring (32 volts or less) shall have a minimum cover of thirty (30) inches. All other wiring shall have a minimum cover of thirty-six (36) inches, and be

run in a separate trench from water lines.

19-3.5 Objectionable Material: No rock or other objectionable material shall be in contact with, or within six (6) inches of any irrigation pipe.

19-3.6 Above-ground Installations: Above-ground installations in public right-of-way shall be located outside of "clear zones." Above-ground installations shall only be permitted in "clear zones" if it is absolutely necessary, and in such case they shall be of breakaway design, or shall be protected by guardrail or other approved means.

19-3.7 Chapter 3 Provisions: All work in public right-of-way shall be in accordance with the applicable provisions of Chapter 3 of this document as well as the provisions of this Chapter.

19-4 INSPECTION AND TESTING

19-4.1 Inspection: All installations in public right-of-way shall be inspected by a Highway Construction and Engineering Division Inspector for compliance with the "Minimum Standards" and by other agencies having jurisdiction.

19-4.2 Hydrostatic Testing: Hydrostatic testing shall be performed on all parts of the main line installation upstream of zone valves in the presence of a County Engineering Inspector in accordance with the provisions of Chapter 10 of this document.

19-4.3 Backfilling: Lines downstream of zone valves shall be brought to operating pressure and all joints visually inspected for leaks by the County Inspector prior to backfilling. When the inspection is complete, the lines shall be deactivated, all leaks repaired, and the lines reactivated for a final inspection. After approval by the Inspector, the trenches may be backfilled. Density testing may be required in accordance with Chapter 3, Sections 3-6.7, and 3-6.8, and applicable drawings in Appendix A.

19-4.4 Final Inspection: For installations in public right-of-way, a final inspection shall be made, jointly, by representatives of the Highway Construction and Engineering Division, the Engineer of Record or Landscape Architect, the permittee and the maintaining entity.

19-5 RESTORATION: The entire work area utilized for the performance of any permitted work shall be restored by the permittee to meet current standards for new construction, as set forth in these Minimum Standards, except as directed by the County Inspector or as provided elsewhere in this document.

19-6 CERTIFICATION AND RECORD DRAWINGS: Prior to scheduling final inspection for acceptance of irrigation systems, except as provided in Chapter 3, Section 3-2.2.3, the Engineer of Record or Landscape Architect shall provide to the Highway Construction and Engineering Division, one (1) set of record drawings showing the diameter, location and elevation of all mains, branches and control lines plus the locations of all pumps, valves and controls, signed and sealed, for the accuracy of the "as-built" location and elevation information, by a Professional

Surveyor and Mapper licensed in the State of Florida, and bearing the Engineer of Record's or Landscape Architect's certification.

In every case, when the design drawings have been produced using a CAD system, the "as-built" or record drawings shall also be produced on the CAD system and the Engineer of Record or Landscape Architect shall also submit a copy of the storage medium containing the information from which the as-built drawings were produced.

CHAPTER 20 – MONITORING WELL INSTALLATIONS

20-1 PERMITS

20-1.1 Requirements: The construction, maintenance, or repair of any installation of monitoring wells in any public right-of-way shall be in accordance with the requirements of the South Florida Water Management District and shall not commence prior to issuance of a permit by the Highway Construction and Engineering Division.

20-1.2 Licensing: A permit for construction shall only be issued to a water well Contractor who is currently licensed by the South Florida Water Management District.

20-2 PERMIT REQUIREMENTS: Notwithstanding the requirements of Chapter 4, Section 1, plans submitted for approval need not be signed and sealed by an Engineer certified in the State of Florida, if prepared by a graduate Geologist, or a graduate Environmental Engineer. All other applicable portions of Chapters 1 through 4 shall be met prior to the issuance of any permit.

20-3 PERMIT FEES AND MAINTENANCE SECURITY: Separate fee and security amounts are to be computed in accordance with the provisions of Chapter 4.

20-4 PLANS AND SPECIFICATIONS

20-4.1 Plan Submittal Requirements: All plans shall be submitted on white prints with blue or black lines. In addition to the proposed project, they shall show all existing facilities as well as all other planned facilities sufficiently to permit the assessment of the compatibility of the proposed work to the existing systems. Plans may be submitted on legal size paper, provided that scale requirements are met.

20-4.2 Right-of-Way Dimensions and Legends: Dimensions of right-of-way widths shall be indicated. All plans shall show suitable legends.

20-4.3 Detailed Plans: The detailed plans shall show the proposed monitoring well location, and dimensioned offset of the monitoring well from right-of-way lines, and existing edge of pavement.

20-4.4 Existing Pavements: Existing pavements shall be indicated by notes and the pavement width and location within the right-of-way shall be shown by dimensions.

20-4.5 Street Names: All street names shall be shown.

20-4.6 Well Covers: All wells shall be covered with a traffic bearing, flush-mounted steel maintenance access structure cover and housing, installed at grade.

20-4.7 Cross-sections: A detailed cross-section of the monitoring well shall be submitted indicating details of locking cap, depth, pipe diameter, well screening, and high water table elevation, in accordance with Drawing 23 in Appendix A.

20-4.8 Construction in an Existing Travel Lane: Construction of a monitoring well in an existing travel lane of any road under County jurisdiction is prohibited except when unavoidable, in which case special provisions shall be made to protect the wellhead and the traveled way.

20-5 MATERIAL: All material used in the construction of monitoring wells shall be subject to the approval of the Highway Construction and Engineering Division.

20-5.1 Well Casings: Well casings shall generally be of PVC. However, in cases of actual or suspected ground water contamination by organic chemicals, PVC may not be the optimal casing material to use. In such cases, the casing shall be of stainless steel unless another material is approved. PVC pipe shall be Schedule 40. All connections shall be threaded.

20-5.2 Well Screens: Well screens shall be of the same material as the casing unless otherwise approved, and the slot size shall be compatible with the grain sizes of the surrounding filter pack material.

20-5.3 Filter Pack Material: Filter pack material shall consist of a mixture of clean sand and gravel of selected grain sizes and gradation. This material is to be installed in uniform thickness in the annular space (two (2) inches minimum) between the well screen and the wall of the well bore. The filter pack should have a larger average grain size and a smaller coefficient of uniformity than the aquifer material.

20-6 INSTALLATION: The provisions of Chapter 3 shall apply.

20-7 RECORD DRAWINGS: On completion of construction, the Contractor permittee shall furnish the Highway Construction and Engineering Division with a "Well Completion Report." The provisions of Chapter 3, Section 3-8.2 notwithstanding, this report need not be certified.

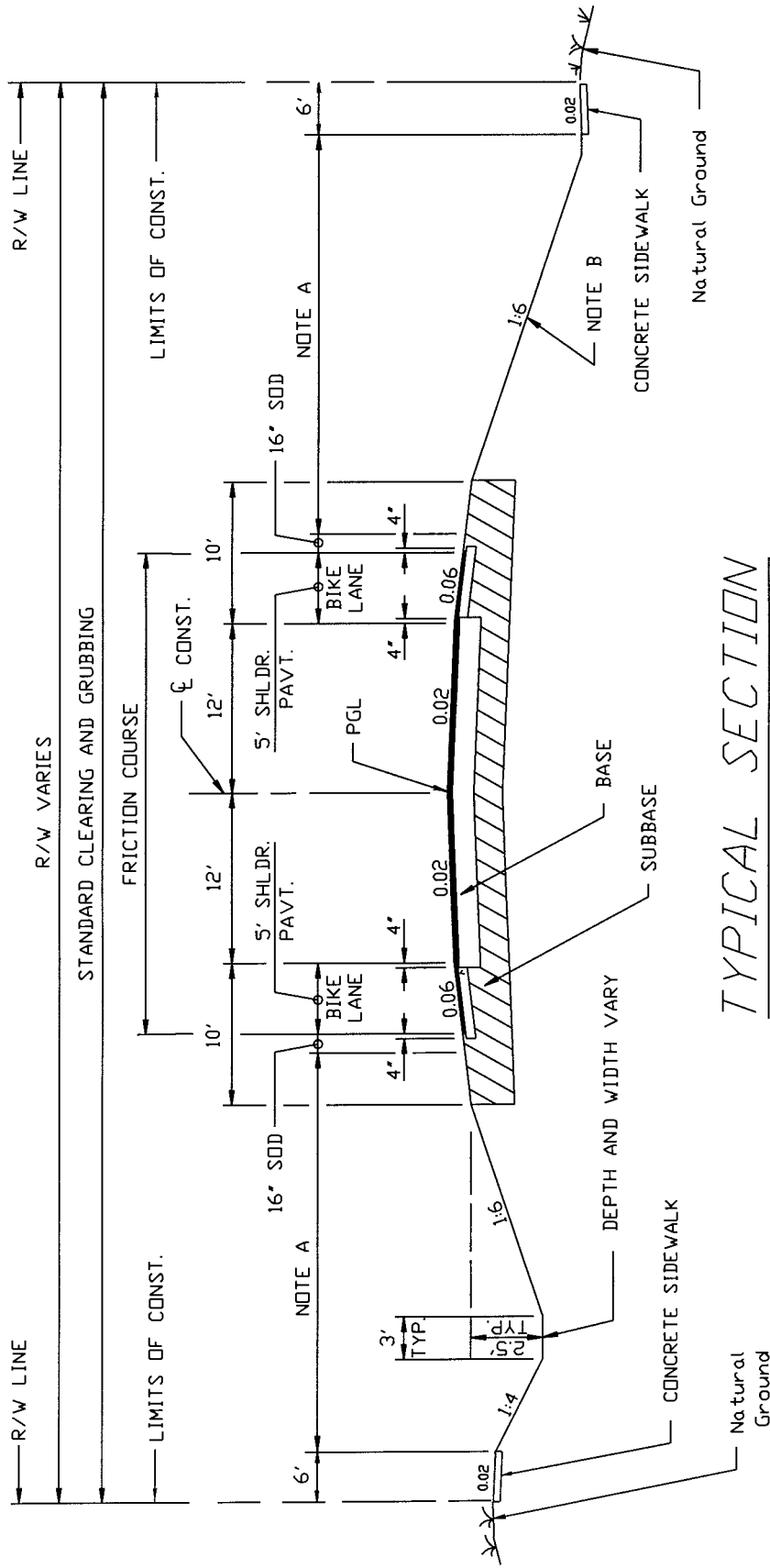
20-8 ABANDONED FACILITIES: The provisions of Chapter 3, Section 3-4.3 shall apply.

APPENDIX A

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NEW CONSTRUCTION WITH DESIGNATED OR UNDESIGNATED BIKE LANE



TYPICAL SECTION

N.T.S.

SEE DWG NO. 2 FOR SHOULDER PAVEMENT DETAIL.
SEE DWG. NO. 6, SHEET 2 OF 2, FOR DRAWING NOTES.

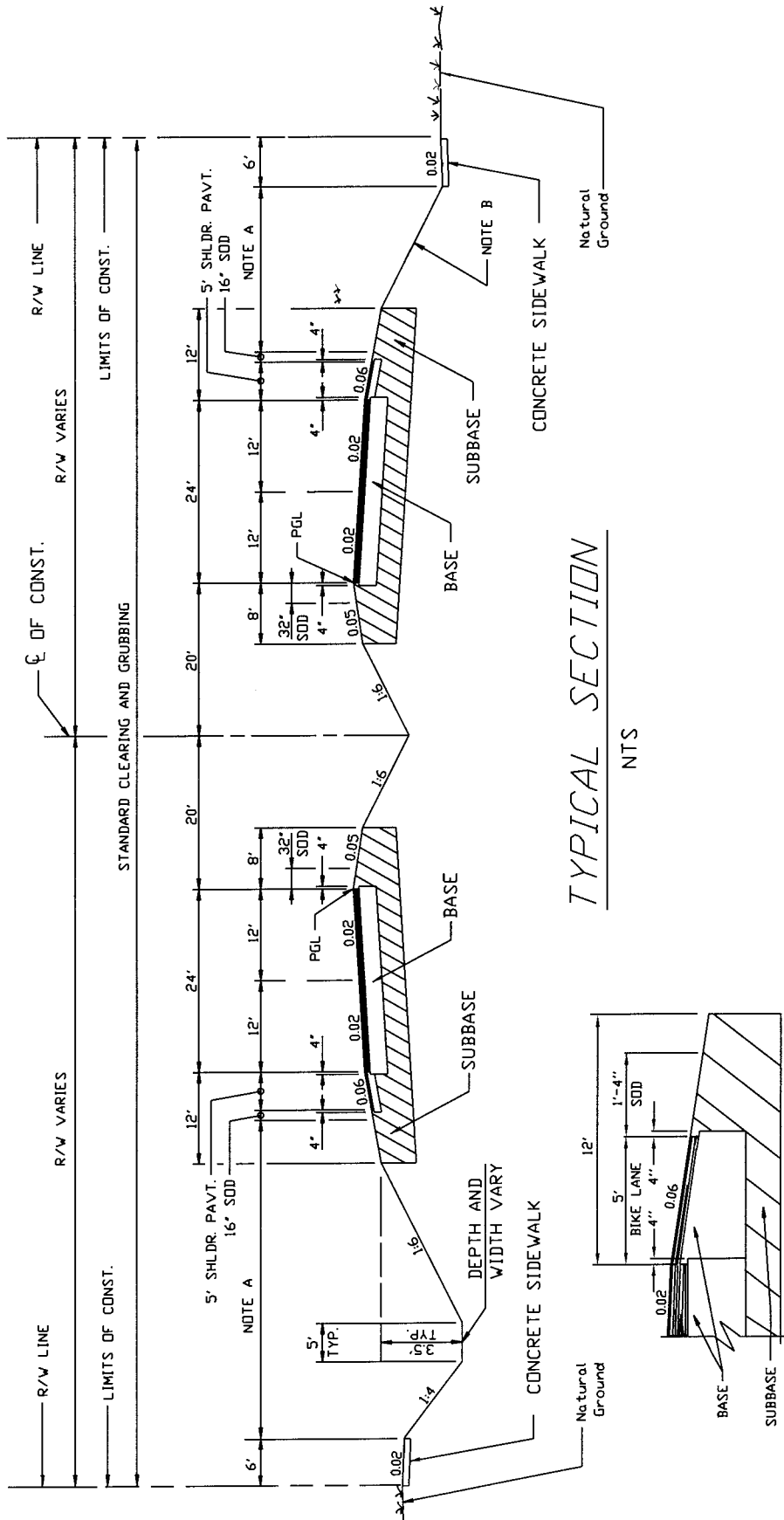
BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

ULTIMATE 2 - LANE (2-WAY)
COLLECTOR
UNDIVIDED RURAL

Approved by: DJH
Revised: 6/01/05 WRH

1
DWG. NO.

NEW CONSTRUCTION WITH DESIGNATED OR UNDESIGNATED BIKE LANE



TYPICAL SECTION
NTS

SHOULDER PAVEMENT DETAIL-NTS

SEE DWG. NO. 6, SHEET 2
OF 2, FOR DRAWING NOTES.

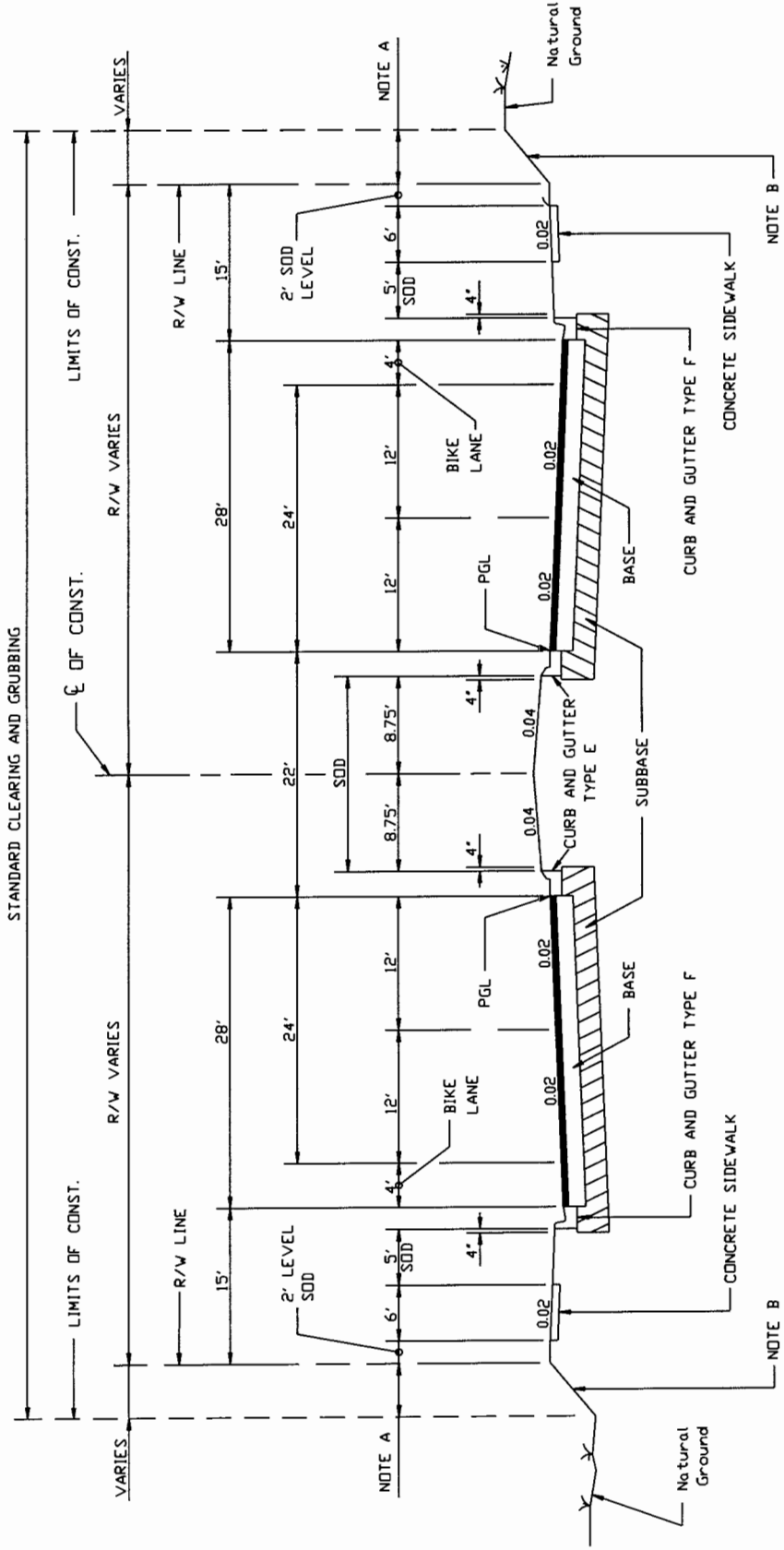
BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

4 - LANE
ARTERIAL / COLLECTOR
DIVIDED RURAL

Approved by: DJH
Revised: 6/01/05 WRH

2
DWG. NO.

NEW CONSTRUCTION WITH DESIGNATED OR UNDESIGNATED BIKE LANE



TYPICAL SECTION

NTS

SEE DWG. NO. 6, SHEET 2
OF 2, FOR DRAWING NOTES.

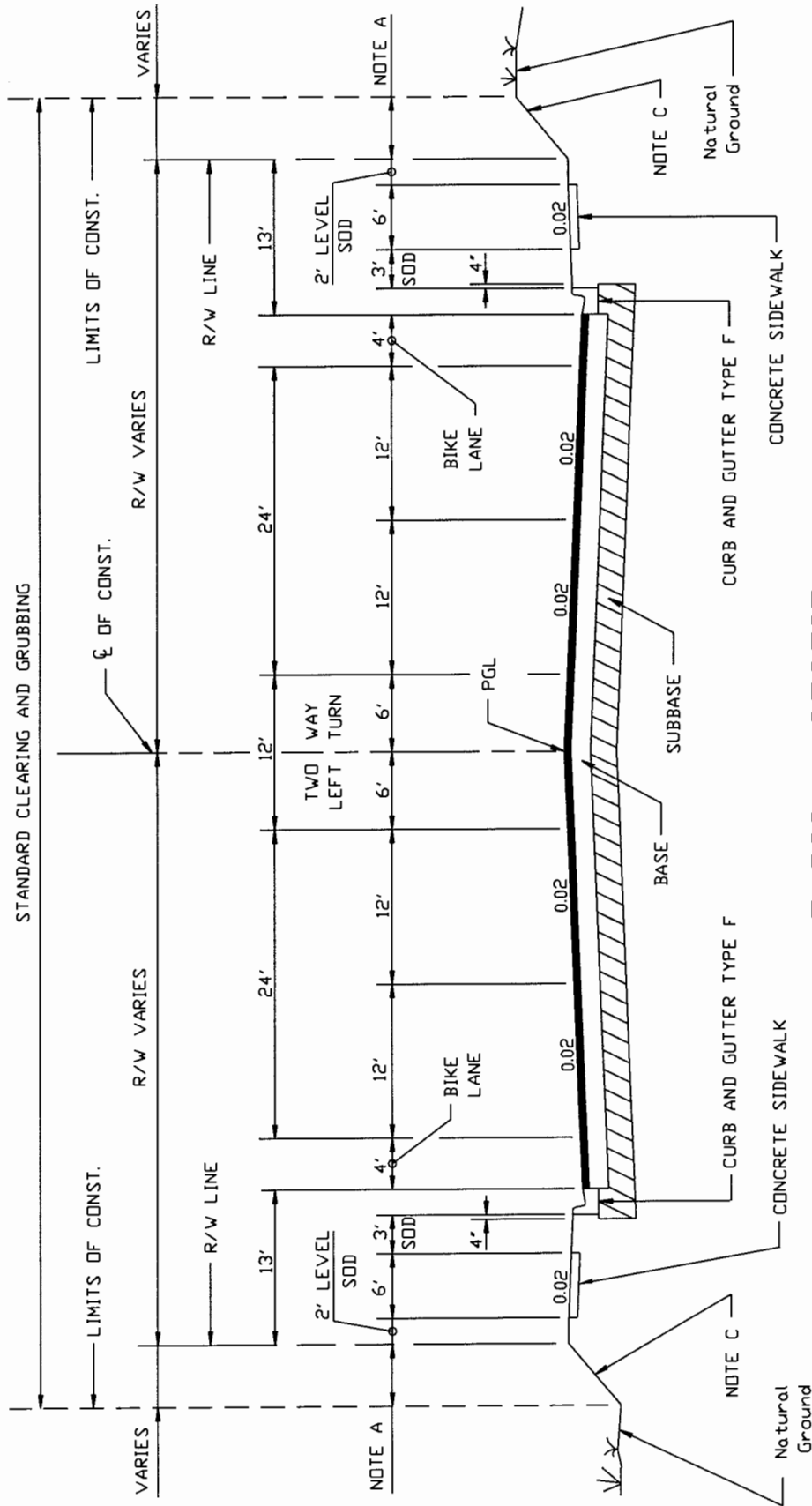
BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

4 - LANE
ARTERIAL
DIVIDED URBAN

Approved by: DJH
Revised: 6/01/05 WRH

3
DWG. NO.

NEW CONSTRUCTION WITH DESIGNATED OR UNDESIGNATED BIKE LANE



TYPICAL SECTION
NTS

SEE DWG. NO. 6, SHEET 2
OF 2, FOR DRAWING NOTES.

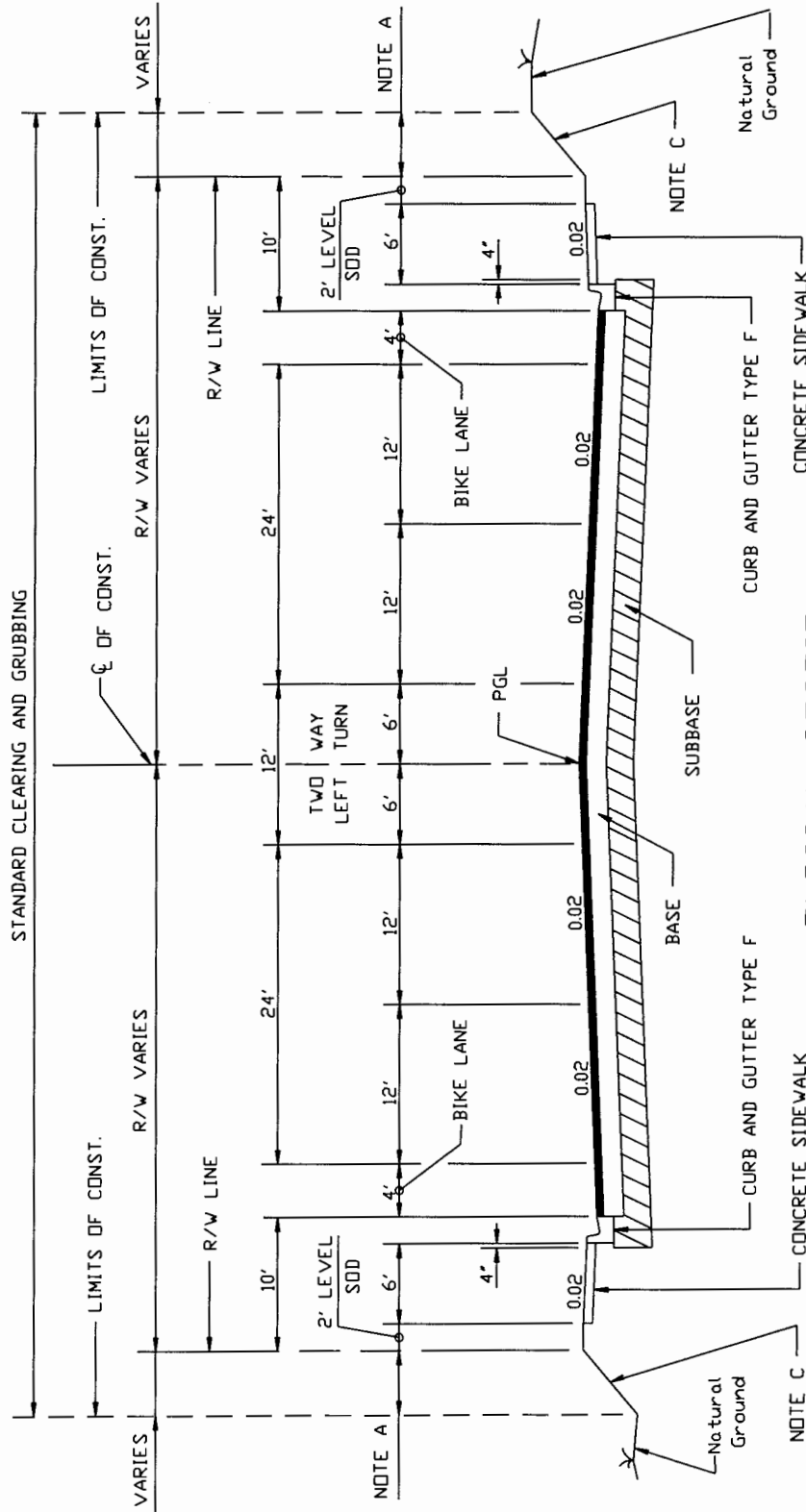
BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

5 - LANE
ARTERIAL / COLLECTOR
UNDIVIDED URBAN

Approved by: DJH
Revised: 6/01/05 WRH

4
DWG. NO.

NEW CONSTRUCTION WITH DESIGNATED OR UNDESIGNATED BIKE LANE



TYPICAL SECTION

N.T.S.

SEE DWG. NO. 6, SHEET 2
OF 2, FOR DRAWING NOTES.

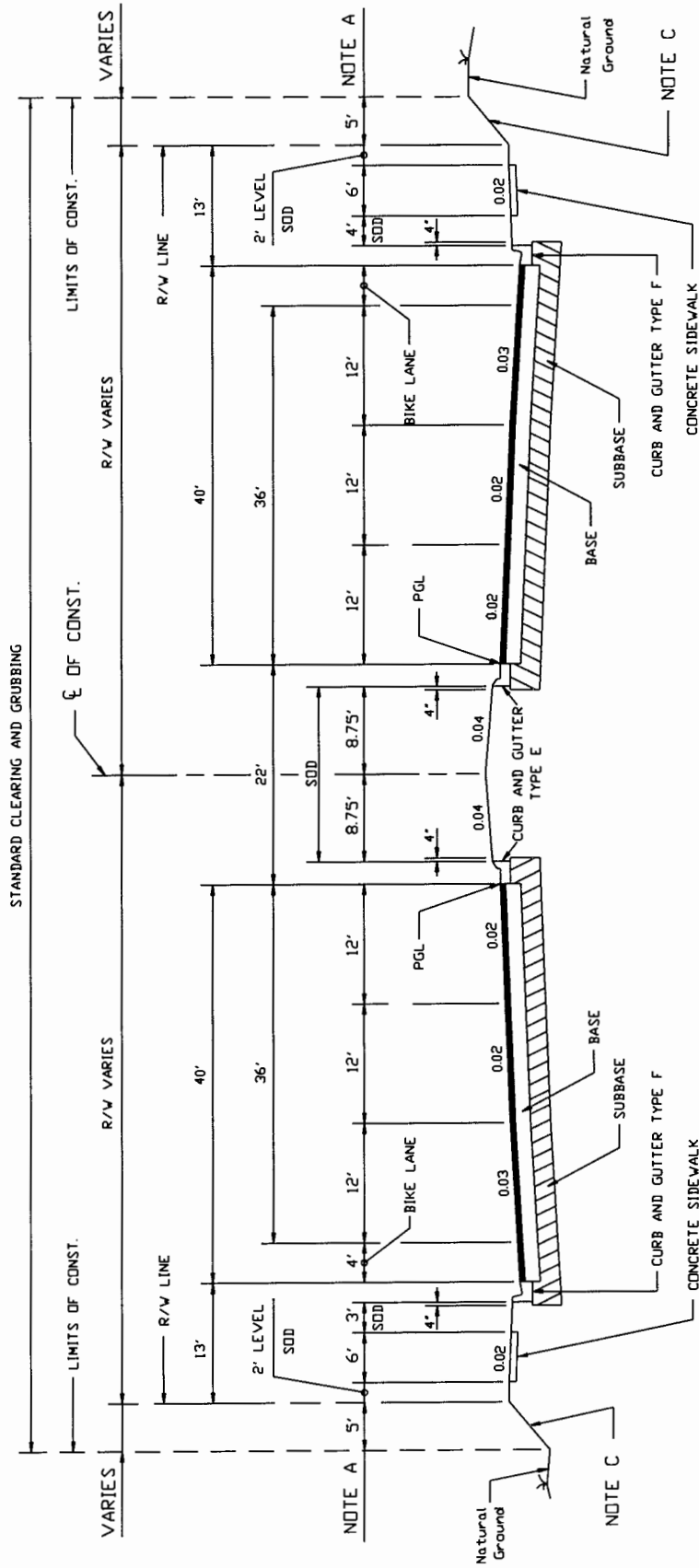
BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

5 - LANE
ARTERIAL / COLLECTOR
UNDIVIDED URBAN

Approved by: DJH
Revised: 6/10/05 WRH

5
DWG. NO.

NEW CONSTRUCTION WITH DESIGNATED OR UNDESIGNATED BIKE LANE



TYPICAL SECTION
NTS

SEE DWG. NO. 6, SHEET 2
OF 2, FOR DRAWING NOTES.

<p>APPROVED BY: <u>DJH</u> REVISED: <u>6/10/05 WRH</u></p>	<p>6 - LANE ARTERIAL DIVIDED URBAN</p>	<p>BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION</p>
<p>DWG. NO. <u>6</u></p>		

DRAWING NOTES FOR NEW CONSTRUCTION - TYPICAL SECTIONS

For submittal of a new roadway or new through lanes, the applicant shall submit sketches of the proposed typical right-of-way sections and pavement design to the Highway Construction and Engineering Division for approval prior to beginning the preparation of plans. Proposed typical right-of-way cross sections shall follow the format and general provisions shown in Drawings 1 through 6. The Highway Construction and Engineering Division may require submittal of a traffic study that evaluates the anticipated traffic volume and the capacity of the new roadway based on Florida Department of Transportation standards.

The typical sections shall show or note all applicable design elements outlined in the "Green Book." Where determination of the "ultimate through lane" is necessary, it will be made in this review.

A typical section shall be shown on all plans. For submittal of a new roadway or new through lanes, the applicant shall submit sketches of the proposed typical right-of-way sections to the Highway Construction and Engineering Division for approval prior to beginning the preparation of plans. Proposed typical right-of-way cross sections shall follow the provisions outlined in Sec. 5-192(c) (2) of the Broward County Land Development Code. The Highway Construction and Engineering Division may require submittal of a traffic study that evaluates the anticipated traffic volume & the capacity of the new roadway based on Florida Department of Transportation standards. The typical sections shall show or note all of the applicable design elements outlined in the "Green Book". Where determination of the "ultimate through lane" is necessary, it shall be made in this review.

Note A: Seed and mulch slopes up to 1:3. Sod slopes steeper than 1:3.

Note B: A slope of 1:6 shall be used to the edge of clear zone.
For fills from 0 to 5 feet a slope of 1:6 shall be used.
For fills to from 5 to 10 feet a slope of 1:4 shall be used.
For fills to from 10 to 20 feet a slope of 1:3 shall be used.
For fills over 20 feet a slope of 1:2 shall be used and guardrail must be provided.

Note C: Slope shall be 1:2 or to suit property owner. It shall not be flatter than 1:6.

Note D: There shall be a minimum separation of two feet between the limits of clearing and grubbing and the area disturbed by construction.

Bike Lanes: Designated bike lanes must be labeled on typical sections, undesignated bike lanes must not be labeled on typical sections.

Pavement Design for Roadways:

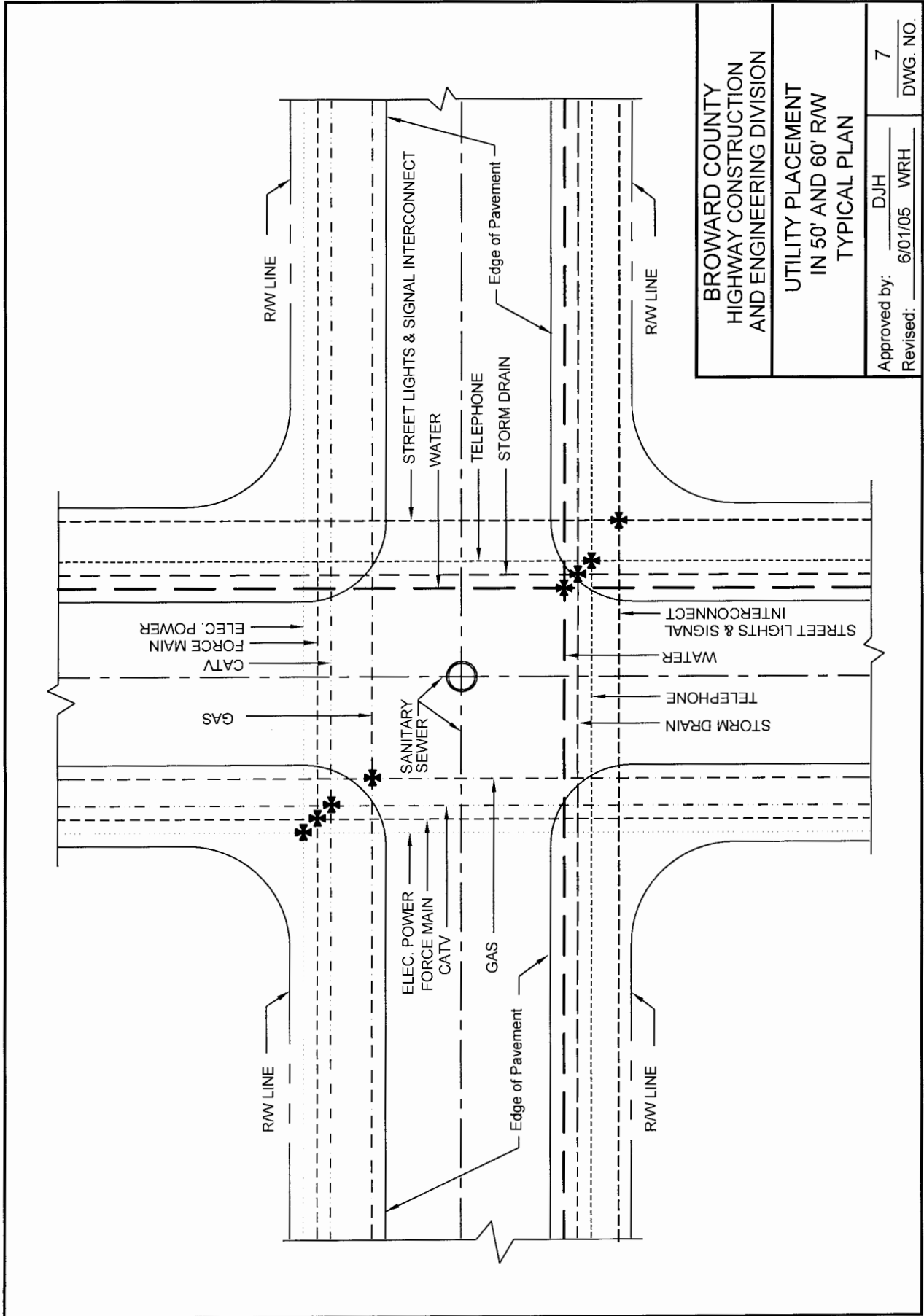
The final lift (friction course) shall be type S-III asphaltic concrete. The structural course shall have a minimum thickness of 1-1/4 ". The proposed base and subbases shall conform to FDOT standards. The structural number for pavement (includes subbase, base, structural course and friction course) shall meet or exceed SN 3.84.

Pavement Design for Shoulders:

The final lift shall be type S-III asphaltic concrete . The proposed base and subbases shall conform to FDOT standards. The structural number for shoulder pavement shall meet or exceed SN 2.84.

Such proposals shall be submitted to the Highway Construction and Engineering Division, whose approval shall be obtained before the proposed design may be incorporated into the project. Meeting the above requirements shall not constitute approval.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
DRAWING NOTES NEW CONSTRUCTION TYPICAL SECTIONS	
Approved by: <u> DJH </u>	<u> 6 </u>
Revised: <u> 6/01/05 WRH </u>	<u> 6 </u> Dwg. No.

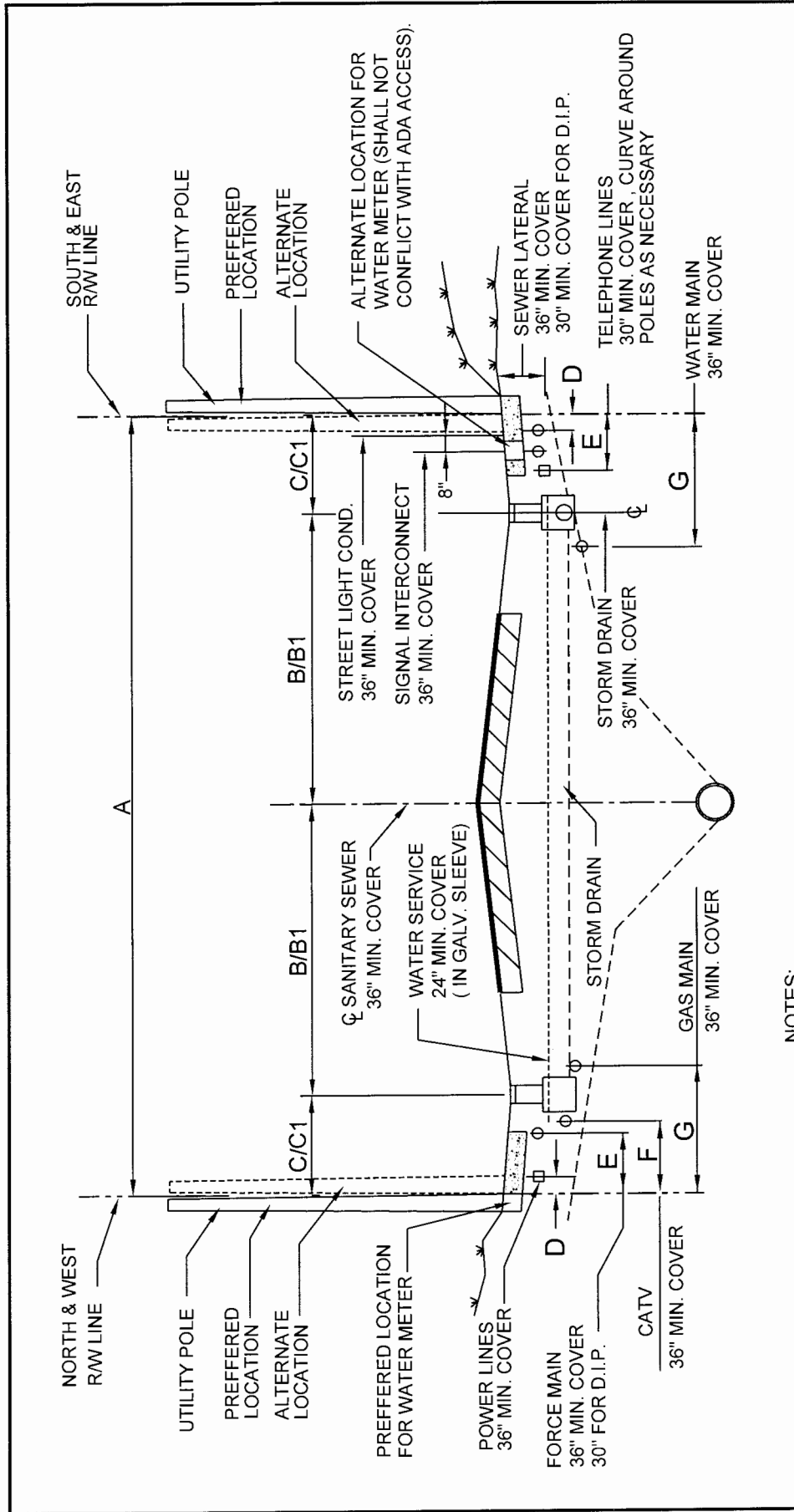


**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

**UTILITY PLACEMENT
IN 50' AND 60' RW
TYPICAL PLAN**

Approved by: DJH
Revised: 6/01/05 WRH

7
DWG. NO.



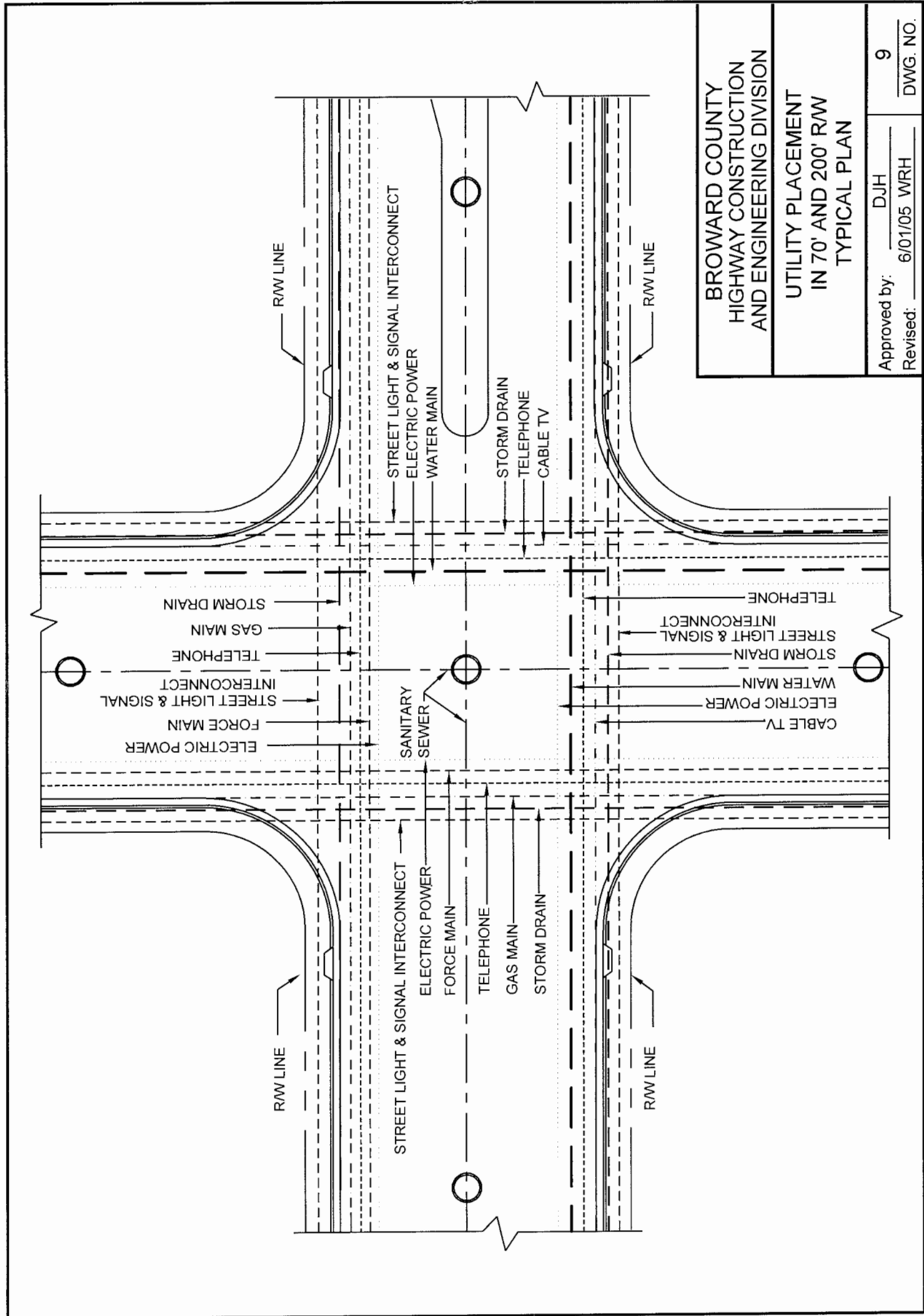
**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

**UTILITY PLACEMENT
IN 50' AND 60' R/W
TYPICAL SECTION**

Approved by: DJH WRH
 Revised: 6/01/05 8 DWG. NO.

- NOTES:**
1. Use B1 & C1 in lieu of B & C for R/W without sidewalks and without positive drainage.
 2. An alternate utility pole location shall only be used if no utility easement is available, and shall be approved by the Broward County Highway Construction and Engineering Division. In such instances the sidewalk design, and placement of all utility lids, junction boxes, etc., shall meet all ADA requirements.
 3. Use of the table shall not supersede utility conflict or separation requirements of other governing agencies

A	B	C	D	E	F	G	B1	C1
50'	17'	8'	1.5'	5'	6'	10.5'	17'	9'
60'	19'	11'	1.5'	5'	6'	14'	21'	9'

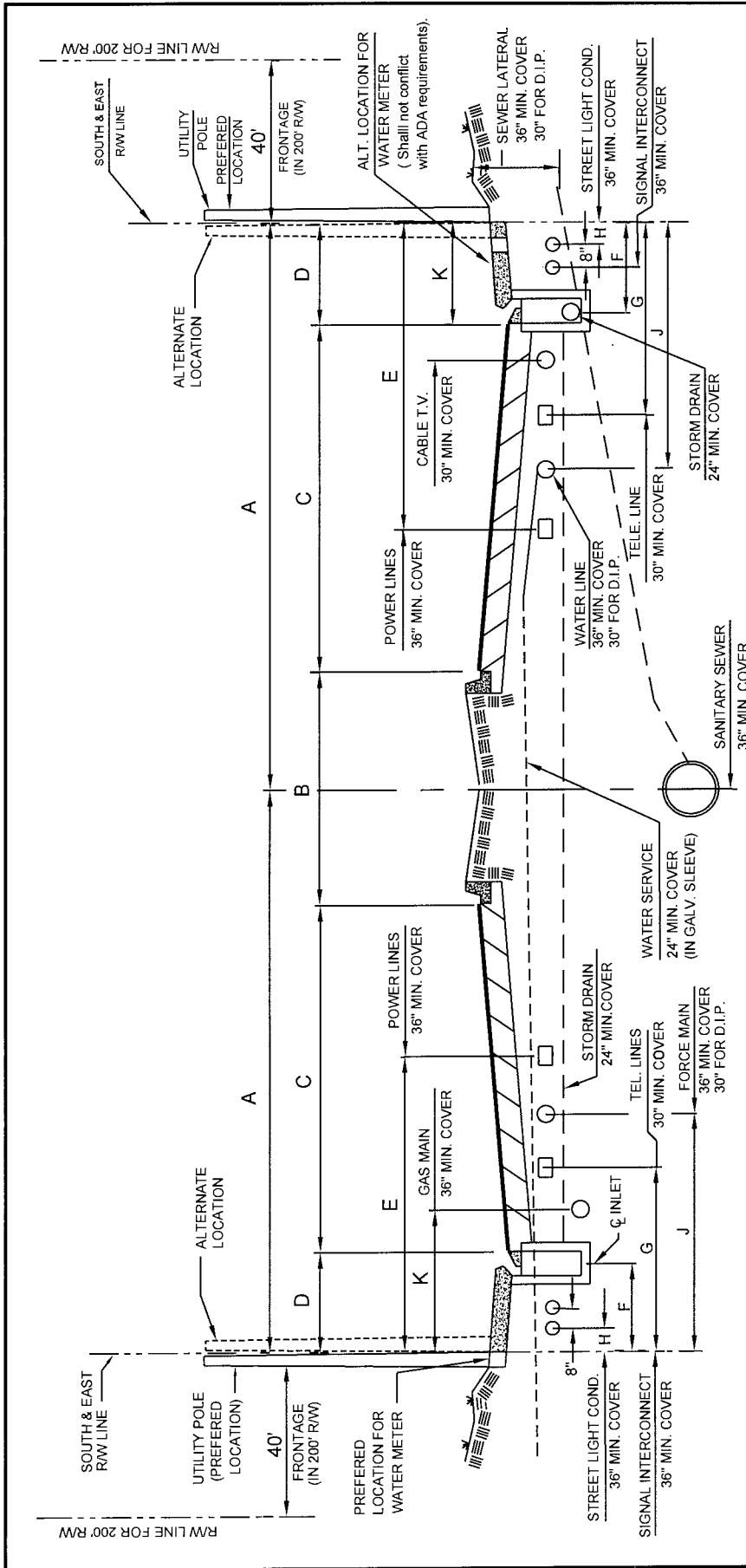


BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

UTILITY PLACEMENT
IN 70' AND 200' RW
TYPICAL PLAN

Approved by: DJH
Revised: 6/01/05 WRH

9
DWG. NO.



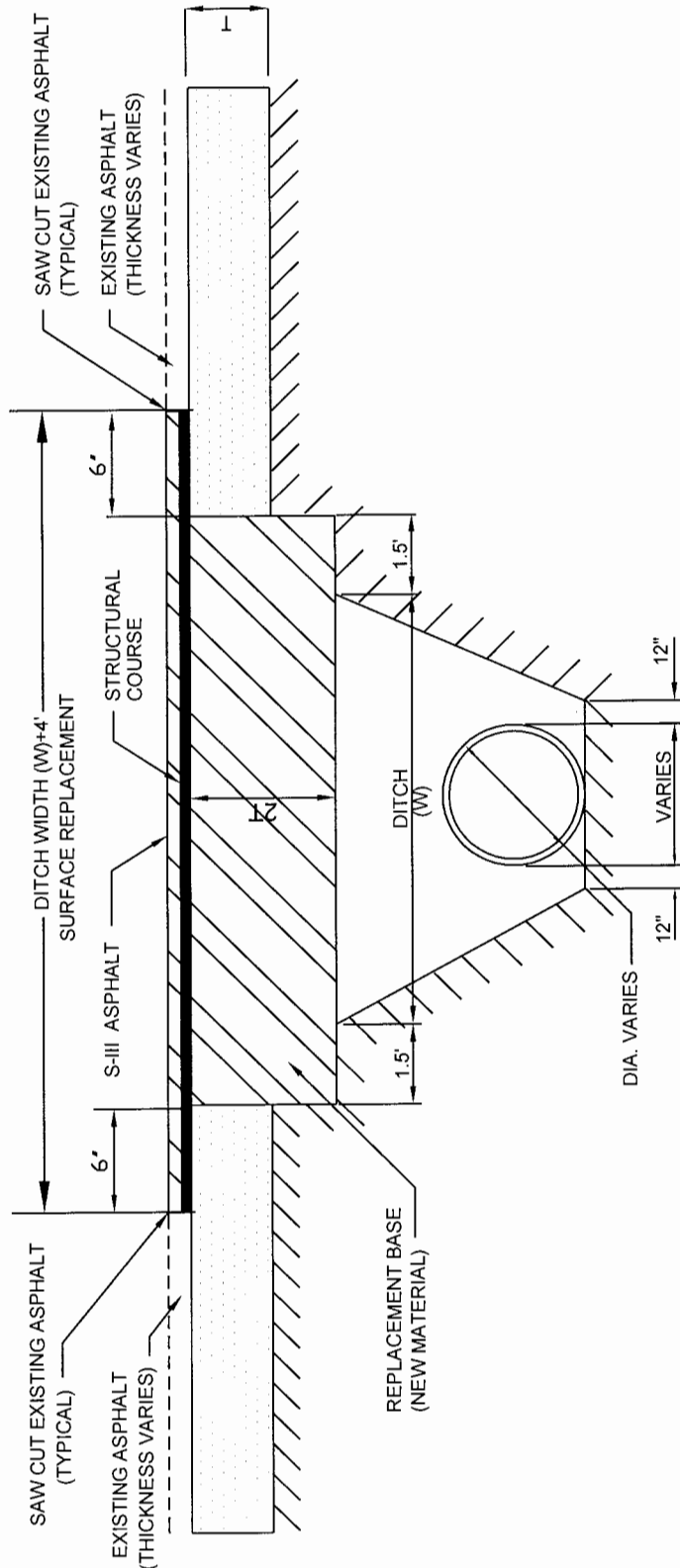
**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

**UTILITY PLACEMENT
IN 70' AND 200' RW
TYPICAL SECTION**

Approved by: DJH WRH
Revised: 6/01/05 10
DWG. NO.

NOTE:
An alternate utility pole location shall only be used if no utility easement is available, and shall be approved by the Broward County Highway Construction & Engineering Division. In such instances the sidewalk design and placement of all utility lids, junction boxes, etc., shall meet all ADA requirements. Use of table shall not supercede utility conflict or separation req. of other governing agencies.

TYPE	A	B	C	D	E	F	G	H	J	K
5L	35	5.5	22	7.5	24	6.25	13	2.5	18	10.0
5L	40	6.0	26	8.0	29	6.75	14	2.5	19	11.0
4LD	40	8.0	24	8.0	26	6.75	14	2.5	19	11.0
4LD	47	11.0	27	9.0	30	7.75	15	2.5	20	12.0
6LD	50	8.0	34	8.0	26	6.75	14	2.5	19	11.0
6LD	53	8.0	37	8.0	28	6.75	14	2.5	19	11.0
6LD	55	10.0	37	8.0	28	6.75	14	2.5	19	11.0
6LD	60	12.0	38	10.0	31	8.75	16	3.5	21	13.0
6LD+P	60	12.0	38	10.0	31	8.75	16	3.5	21	13.0



TYPICAL SECTION

NOTE: THIS DETAIL APPLIES TO ALL INSTALLATIONS THAT REQUIRE AN OPEN CUT IN PAVEMENT.

- GENERAL NOTES:**
1. BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL.
 2. BASE MATERIAL SHALL BE PLACED IN 6" MAXIMUM LAYERS (LOOSE MEASUREMENT) AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.
 3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
 4. SURFACE MATERIAL SHALL BE CONSISTENT WITH THE SURROUNDING SURFACE MATERIAL.
 5. BASE MATERIAL SHALL HAVE A MIN. CARBONATE OF 70% (60% FOR LOCAL STREETS).
 6. SUB GRADE MATERIAL SHALL BE GRANULAR AND ANGULAR AND SHALL HAVE A MINIMUM LBR OF 40.
 7. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" THICK ASPHALT CONCRETE PATCH TO KEEP THE FILL MATERIAL FROM RAVELING, UNTIL REPLACED WITH A PERMANENT PATCH.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
RESTORATION OF FLEXIBLE PAVEMENT CROSSING USING LIMEROCK BASE	
Approved by: DJH	11
Revised: 6/01/05 WRH	DWG. NO.

ADDITIONAL NOTES FOR RESTORATION OF FLEXIBLE PAVEMENT:

The procedure for backfill and pavement restoration is as follows:

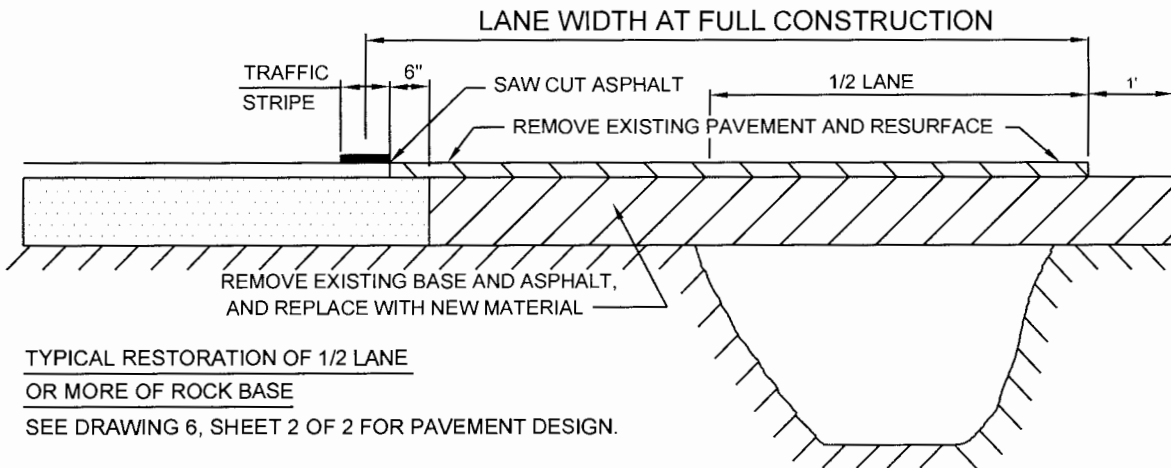
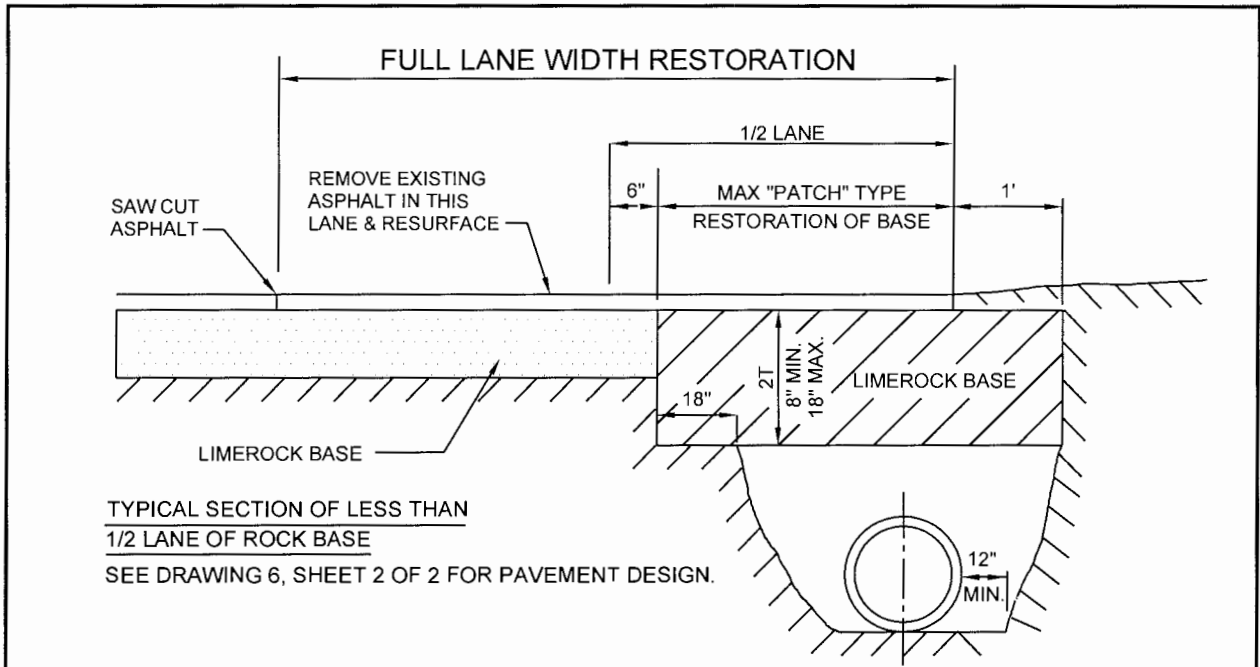
Density tests shall be taken at 6" lift of base rock and each 8" lift of compacted fill or backfill according to the following schedule, prior to placement of the succeeding lifts:

1. For any road crossing in which the road is cut and restored one lane at a time, one density test shall be taken in each lane at each lift.
2. For any road crossing in which the road is cut and restored two lanes at a time, density shall be tested in one lane per lift, alternating lanes with each lift.
3. For any road crossing in which the road is cut and restored three lanes at a time, density shall be tested in two locations per lift, staggering locations with each successive lift.
4. Cuts in roads shall not be left open over-night unless specific permission has been obtained from the Highway Construction and Engineering Division. Trenches shall be back filled & temporary asphalt applied to make a smooth level patch. The trench shall then be excavated the next day & permanent backfill & pavement installed in accordance with these standards. The only exceptions shall be in cases where the facility installed must be tested before the roads are restored. In these cases, the permanent restoration must be performed on the day of testing or the next day.
5. In cases where the installation parallels the roadway and damages the pavement, the density tests shall be made every 100' at each lift, with test locations staggered 25' for each lift.
6. Roadway base material shall be compacted to a maximum of 98% of maximum dry density, as determined by AASHTO T-180 (Modified Proctor Test). Subgrade material under paved areas shall be compacted to a minimum of 100% of maximum dry density as per AASHTO T-99C. Shoulder areas and swales beyond shoulders shall be compacted to a minimum of 95% dry density, all as determined by AASHTO T-99-C (Standard Proctor Test).
7. Restoration of striping, signing and signalization devices shall be accomplished immediately after pavement restoration is completed, as approved by the Traffic Engineering Division.

A copy of all Proctor and Field Tests shall be furnished to the Highway Construction and Engineering Division upon request.

NOTE: The above represents the minimum procedure. Inspectors may require additional testing if, in their opinion conditions or prior test results warrant them.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
RESTORATION OF FLEXIBLE PAVEMENT CROSSING USING LIMEROCK BASE	
Approved by: <u> DJH </u>	<u> 11 </u>
Revised: <u> 6/01/05 </u> <u> WRH </u>	Dwg. No.



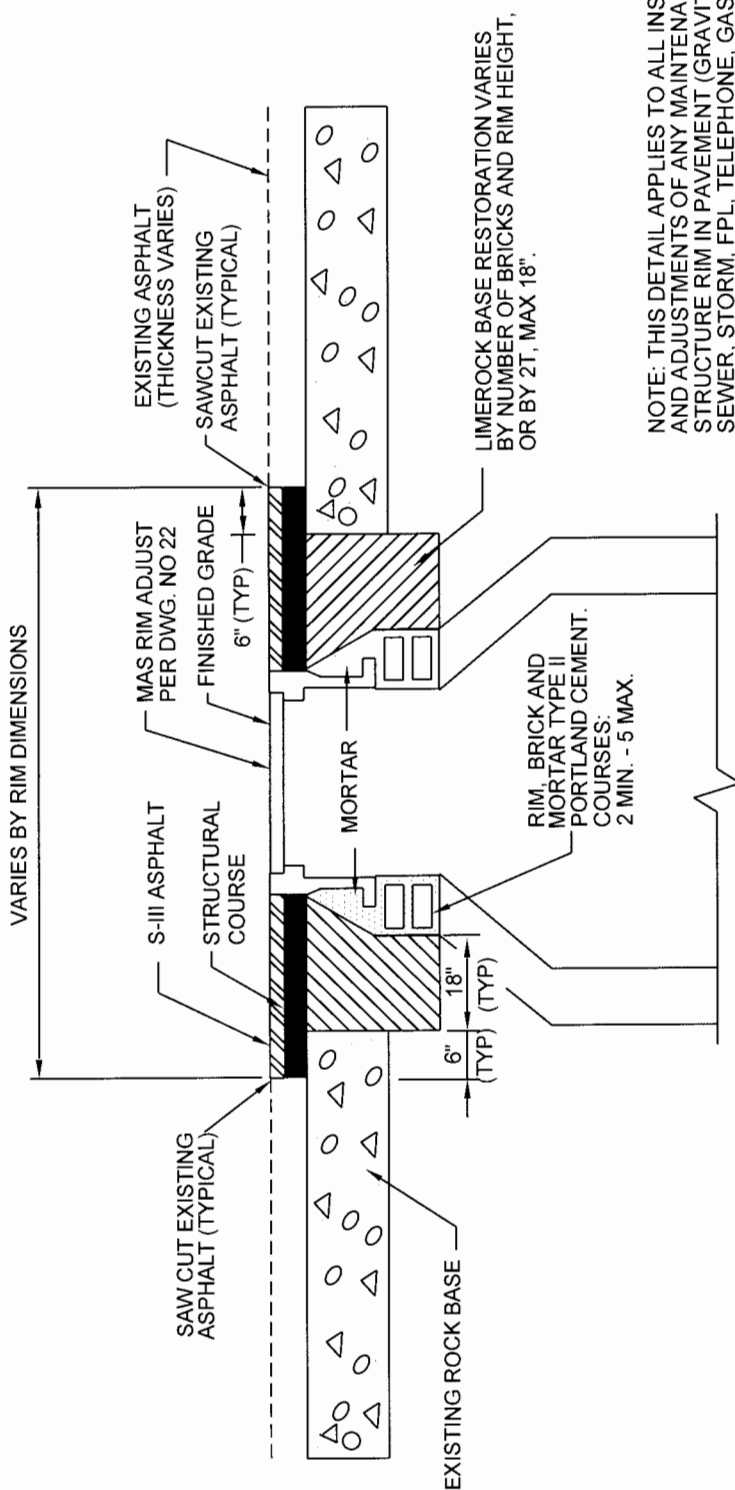
RESTORATION OF FLEXIBLE PAVEMENT - LONGITUDINAL CUTS

(THIS DRAWING IS TO BE WORKED WITH DRAWING NO.11)

NOTES:

1. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 AND A MINIMUM CARBONATE CONTENT OF 70% (60% FOR LOCAL STREETS).
2. BASE SHALL BE PLACED IN 6" MAXIMUM THICKNESS LAYERS WITH EACH LAYER COMPACTED AS REQUIRED AND TESTED PRIOR TO THE PLACEMENT OF THE SUCCEEDING LAYER.
3. SUB GRADE MATERIAL SHALL BE GRANULAR AND ANGULAR AND SHALL HAVE A MINIMUM LBR OF 40.
4. BACKFILL SHALL BE PLACED AND COMPACTED IN 8" LAYERS, BUT TESTING WILL BEGIN 12" ABOVE THE INSTALLED FACILITY.
5. ALL EDGES OF EXISTING ASPHALT PAVEMENT THAT SHALL ABUT RESURFACING SHALL BE SAW CUT IN STRAIGHT LINES PARALLEL TO OR PERPENDICULAR TO THE ROADWAY, PRIOR TO RESURFACING.
6. RESURFACING MATERIAL SHALL BE CONSISTENT WITH SURROUNDING SURFACE, AND SHALL BE APPLIED A MINIMUM OF 3/4" AND A MAXIMUM OF 2" IN THICKNESS.
7. TRAFFIC STRIPS SHALL NOT BE PLACED DIRECTLY ON TOP OF THE JOINT.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
RESTORATION OF FLEXIBLE PAVEMENT LONGITUDINAL CUTS USING LIMEROCK BASE	
Approved by: <u> DJH </u>	<u> 12 </u>
Revised: <u> 6/01/05 WRH </u>	DWG. NO.



NOTE: THIS DETAIL APPLIES TO ALL INSTALLATIONS AND ADJUSTMENTS OF ANY MAINTENANCE ACCESS STRUCTURE RIM IN PAVEMENT (GRAVITY SEWER, SEWER, STORM, FPL, TELEPHONE, GAS COMMUNICATION CABLE, ETC.)

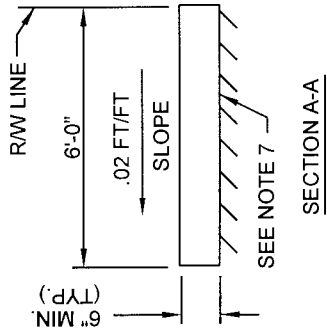
GRADE RINGS MAY BE USED IN LIEU OF BRICKS WITH APPROVAL BY THE HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION.

TYPICAL SECTION

GENERAL NOTES

1. BASE MATERIAL SHALL BE PLACED IN 6" MAXIMUM (LOOSE MEASUREMENT) LAYERS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180
2. ASPHALT PAVEMENT PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
3. SURFACE MATERIAL SHALL BE CONSISTENT WITH THE SURROUNDING SURFACE MATERIAL.
4. BASE MATERIAL SHALL HAVE A MINIMUM CARBONATE OF 70% (60% FOR LOCAL STREETS).
5. UNDER NO CIRCUMSTANCES SHALL ASPHALT REPAIR BE LESS THAN THE THICKNESS OF THE EXISTING PAVEMENT.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
RESTORATION OF FLEXIBLE PAVEMENT - LIMEROCK BASE (AT MAINTENANCE ACCESS STRUCTURE)	
Approved by: <u>DJH</u>	13
Revised: <u>6/01/05</u> <u>WRH</u>	DWG. NO.



NOTES:

1. CONCRETE TO BE CLASS 1, 3000 P.S.I.
2. THE USE OF REINFORCEMENT IS NOT PERMITTED.
3. SIDEWALK SLOPES SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
4. RAMPS SHALL BE PROVIDED AT ALL INTERSECTIONS IN ACCORDANCE WITH FDOT INDEX 304.
5. THE VERTICAL DEVIATION FOR A NEW SIDEWALK SHALL NOT BE MORE THAN 1/2".
6. THE VERTICAL DEVIATION FOR A NEW MAINTENANCE ACCESS STRUCTURE COVER SHALL NOT BE MORE THAN 1/4".
7. SUBGRADE MATERIAL SHALL BE COMPACTED TO 100% OF MAXIMUM DENSITY, PER AASHTO T-99.
8. STAMPED CONCRETE IS NOT ALLOWED IN LIEU OF TRUNCATED DOMES.
9. SEE HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION APPROVED PRODUCT LIST FOR ACCEPTABLE MATERIALS FOR TRUNCATED DOMES.

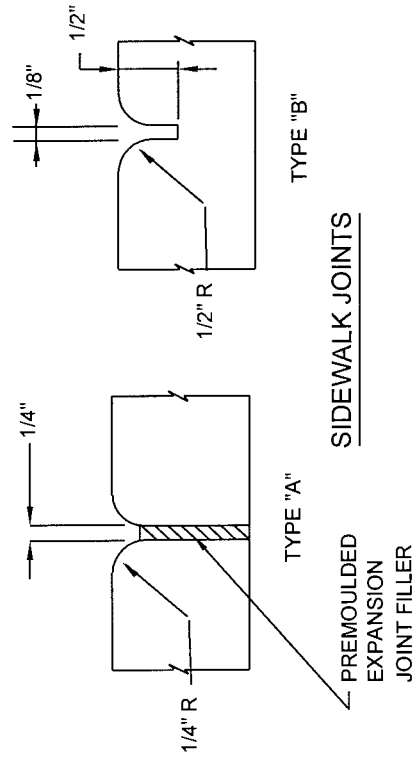
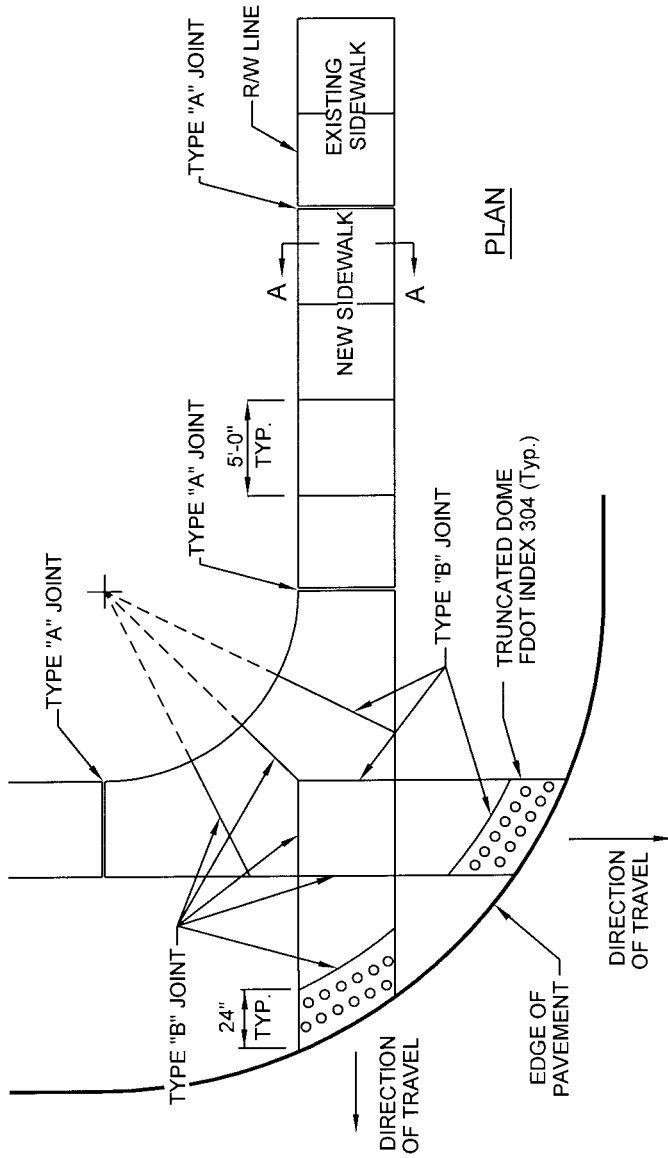
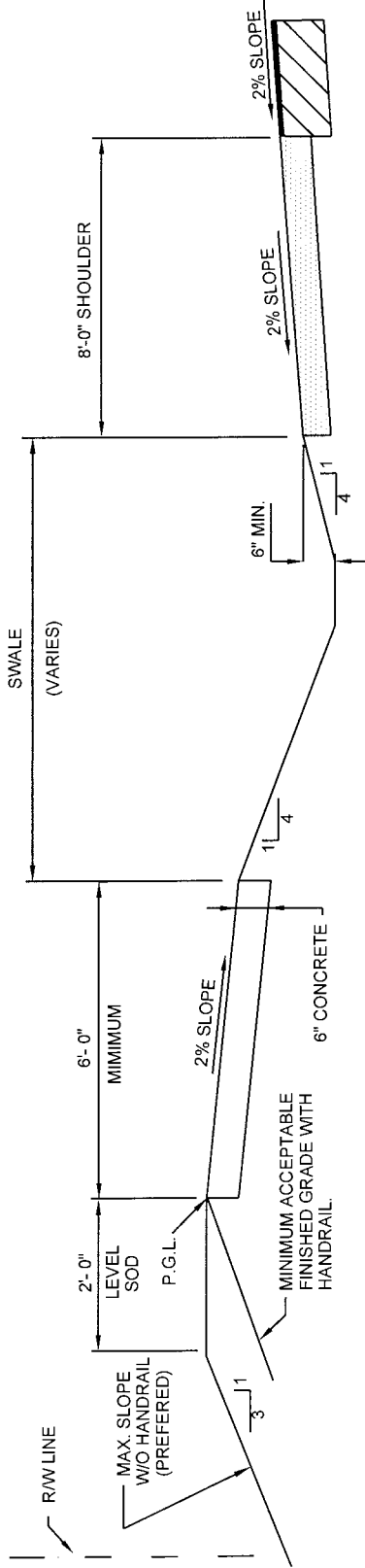


TABLE OF SIDEWALK JOINTS	
TYPE	LOCATION
"A"	P.C. P.T. OF CURVES & WHERE SIDEWALK ABUTS CONCRETE DRIVEWAY.
"B"	5'-0" CENTER TO CENTER ON SIDEWALKS.

**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

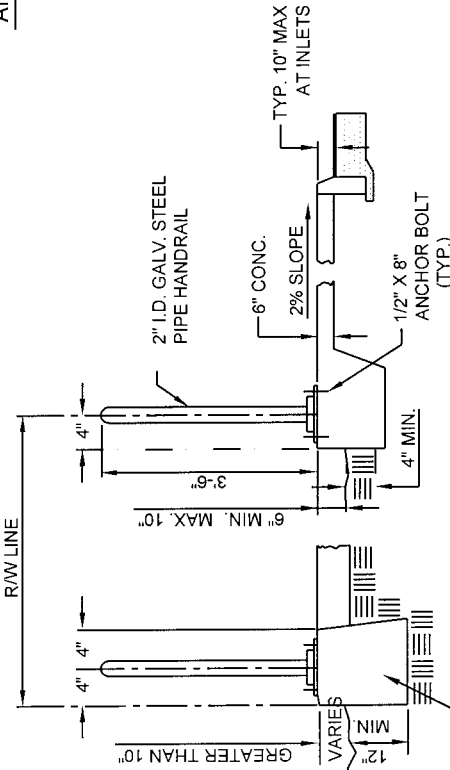
**SIDEWALK
TYPICAL DETAILS**

Approved by: DJH 14
 Revised: 6/01/05 WRH DWG. NO.



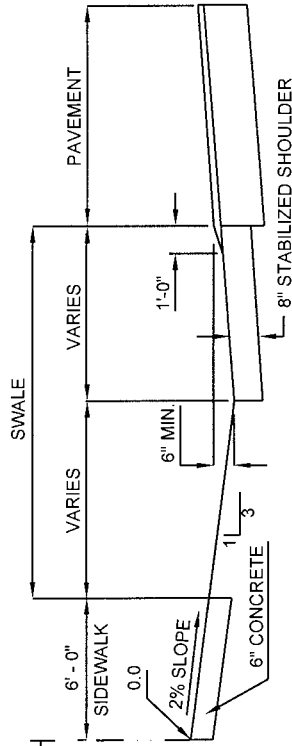
TYPICAL SECTION THROUGH SIDEWALK SHOULDER AND SWALE AT MULTI-LANE ROAD

NTS



TYPICAL HANDRAIL DETAIL AT SIDEWALK WHERE ABUTTING GRADE DIFFERS FROM SIDEWALK GRADE

NTS



TYPICAL SECTION THROUGH SIDEWALK AND SWALE AT 2-LANE LOCAL ROAD

NTS

NOTES:

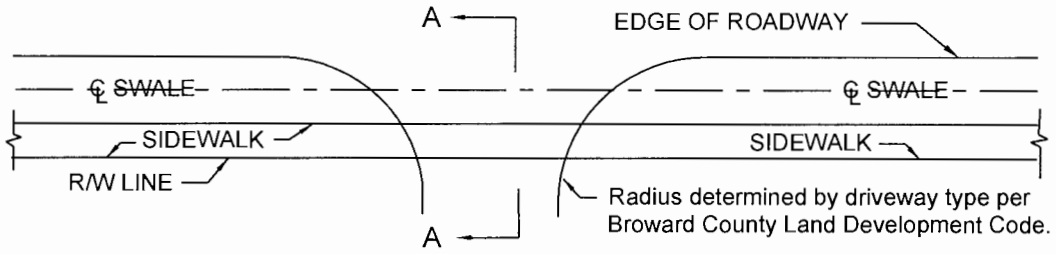
1. ELEVATIONS REFER TO PROFILE GRADE LINE (P.G.L.)
2. FOR DETAILS NOT SHOWN SEE CHAPTERS 6 AND 7.
3. FOR SWALES WIDER THAN 18 FEET, SLOPES SHALL BE AS SPECIFIED BY THE HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION.
4. FINISHED GRADE OF TURF SHALL BE 2" BELOW EDGE OF PAVEMENT AND TOP OF SIDEWALK.
5. MATERIAL BENEATH SIDEWALKS AND SWALES SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

SWALE AND SIDEWALK
TYPICAL SECTIONS

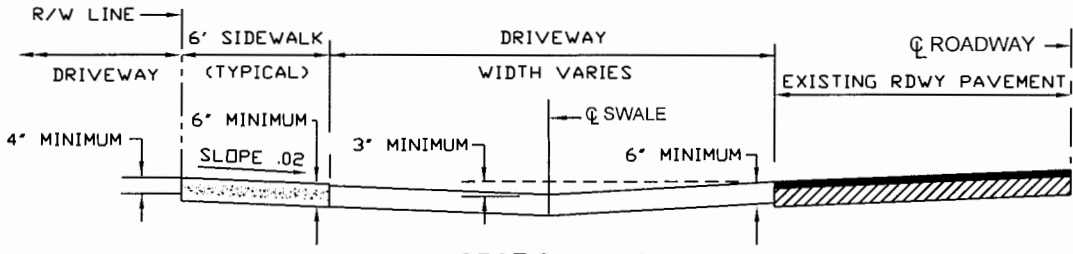
Approved by: DJH
Revised: 6/01/05 WRH

15
DWG. NO.



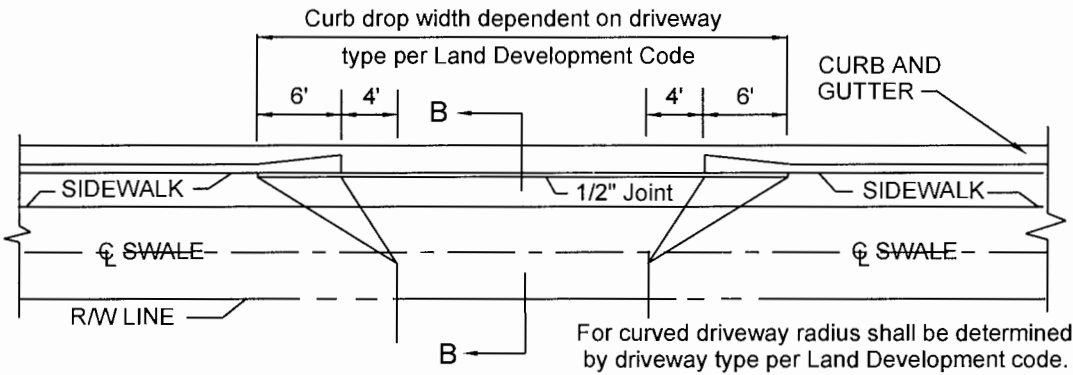
PLAN - DRIVEWAY WITH SIDEWALK SETBACK FROM UNCURBED ROADWAY

NTS



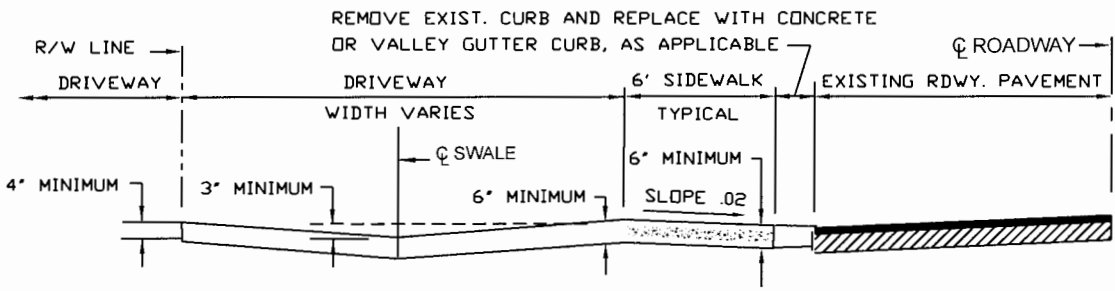
SECTION A-A

NTS



PLAN - DRIVEWAY WITH SIDEWALK ADJACENT TO CURBED ROADWAY

NTS



SECTION B-B

NTS

NOTES:

1. SIDEWALK AND DRIVEWAY ON STREET SIDE OF R/W LINE SHALL BE 6" MINIMUM CONCRETE (3000 PSI), WITH NO REINFORCEMENT.
2. MATERIAL BENEATH SIDEWALKS AND SWALES SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

DRIVEWAY, SWALE &
SIDEWALK - DETAILS

Approved by: DJH
Revised: 6/01/05 WRH

16
DWG. NO.

DESIGN CALCULATIONS

EXAMPLE:
 REQUIREMENTS: DESIGN FOR ONE INCH OF RUNOFF FOR EACH SQUARE FOOT OF DRAINAGE AREA. PROVIDE STORAGE FOR 100% OF THE RUNOFF.

LENGTH PAVED = 40'
 LENGTH OF PAVEMENT ALLOWED = 30% OF 100 ft. = 30 ft.

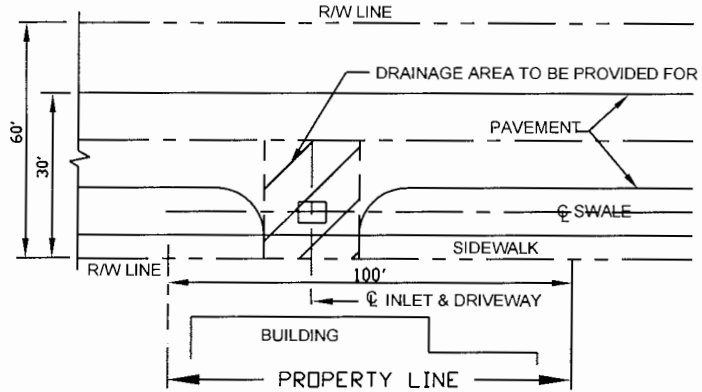
DRAINAGE TO BE PROVIDED FOR:
 30 ft. x 40 ft. = 1200 sq. ft.
 1200 ft. x 0.08 = 96 cu. ft.

CALCULATION FOR DESIGN OF SYSTEM

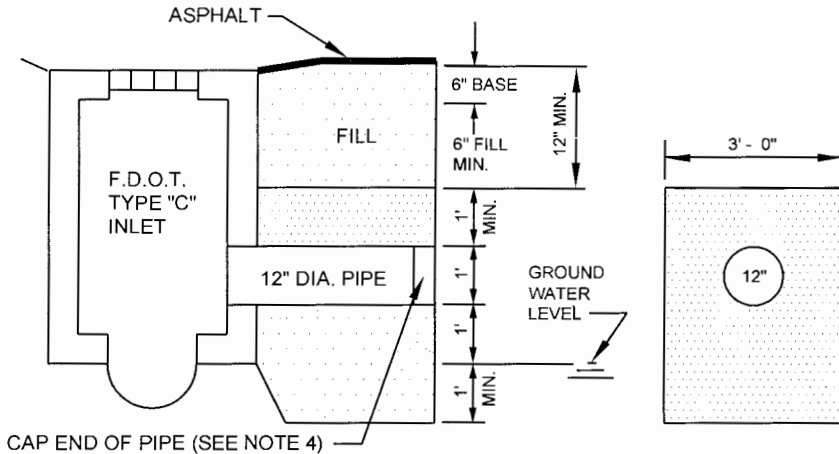
1. VOLUME OF TYPE "C" CATCH BASIN
 $2.10 \times 2.79 \times 3.5 =$
 VOL. = 20.56 cu. ft.
2. AREA OF 12" PIPE
 $A = \pi \times R^2$
 $A = 3.14 \times (0.5)^2$
 A = 0.8 sq. ft.
3. STORAGE AREA OF DRAINFIELD
 50% OF (3' x 3'-0.8)
 A = 4.1 sq. ft.
4. REQD. DRAINFIELD & PIPE STORAGE VOLUME (VR)
 $VR = \text{TOT. REQD. VOL.}$
 $VR = 96 \text{ cu. ft.} - 20.56 \text{ cu. ft.}$
5. LENGTH OF DRAINFIELD
 $L = \frac{VR}{ADF \times AP} = \frac{75.44 \text{ cu ft}}{(4.1+0.8) \text{ sq ft}}$
 $L = \frac{75.44}{4.9} = 15.44'$

USE 16'

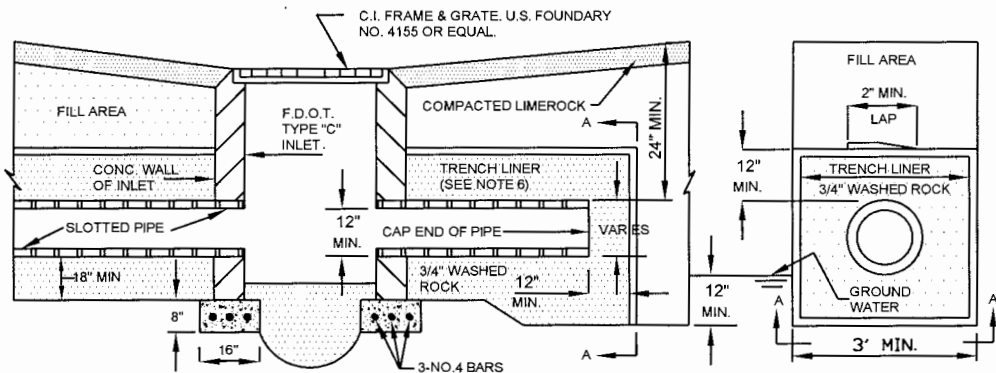
NOTE: DRAINFIELD MAY BE ON ONE SIDE OF THE CATCH BASIN OR BE DIVIDED ON TWO SIDES.



PLAN



TYPICAL SECTION

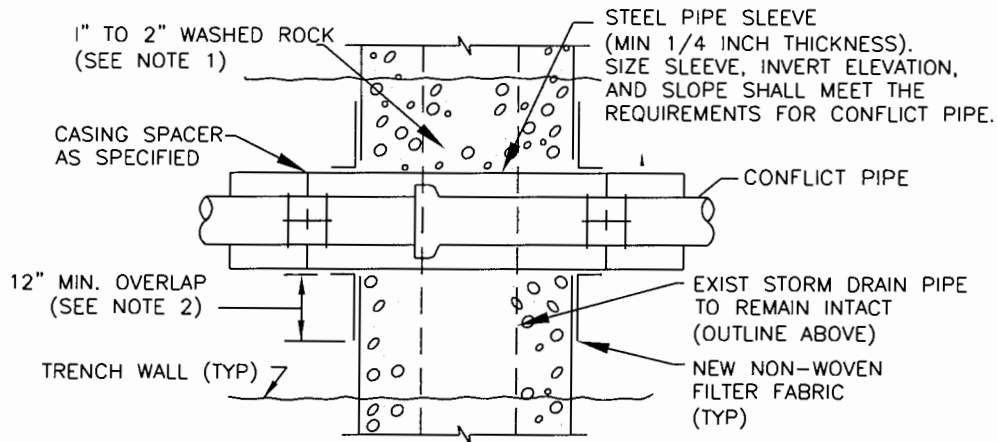


INSTALLATION DETAILS - TYPICAL SECTION

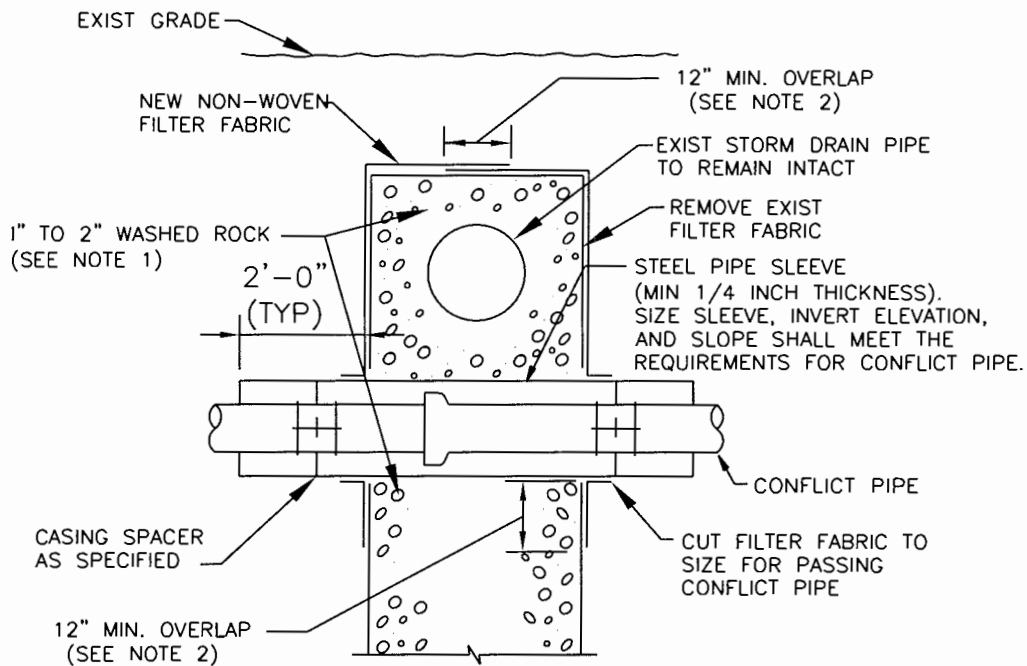
NOTES:

1. CONCRETE SHALL BE 3000 PSI COMPRESSIVE STRENGTH, MINIMUM.
2. PIPE SHALL BE 12" SLOTTED CONC. MEETING A.S.T.M. STDS. OTHER TYPES OF DRAIN PIPE REQ. HIGHWAY CONSTRUCTION & ENGINEERING DIVISION APPROVAL.
3. PIPES SHALL TERMINATE WITH SCREEN OR SHALL CONNECT TO ADDITIONAL CATCH BASINS AS REQUIRED.
4. COVER PIPE ENDS WITH NO. 10 GALVANIZED OR ALUMINUM SCREEN, WITH OPENINGS NO LARGER THAN 1/2" x 1/2".
5. BALLAST ROCK SHALL BE FROM FRESH WATER AND WASHED FREE OF DELETERIOUS MATERIAL.
6. SIDES, ENDS, AND TOP OF ROCK SHALL BE COVERED WITH APPROVED FILTER FABRIC LAPPED 2' MIN. AT LOCATIONS WHERE TWO OR MORE PIECES MEET. OVERLAPS AT SIDE OF TRENCH SHALL BE AVOIDED.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
DRAINAGE REQUIREMENTS WHEN PAVING OVER 30% OF SWALE	
Approved by: <u> DJH </u>	17
Revised: <u> 6/01/05 WRH </u>	DWG. NO.



PLAN



SECTION

NOTES:

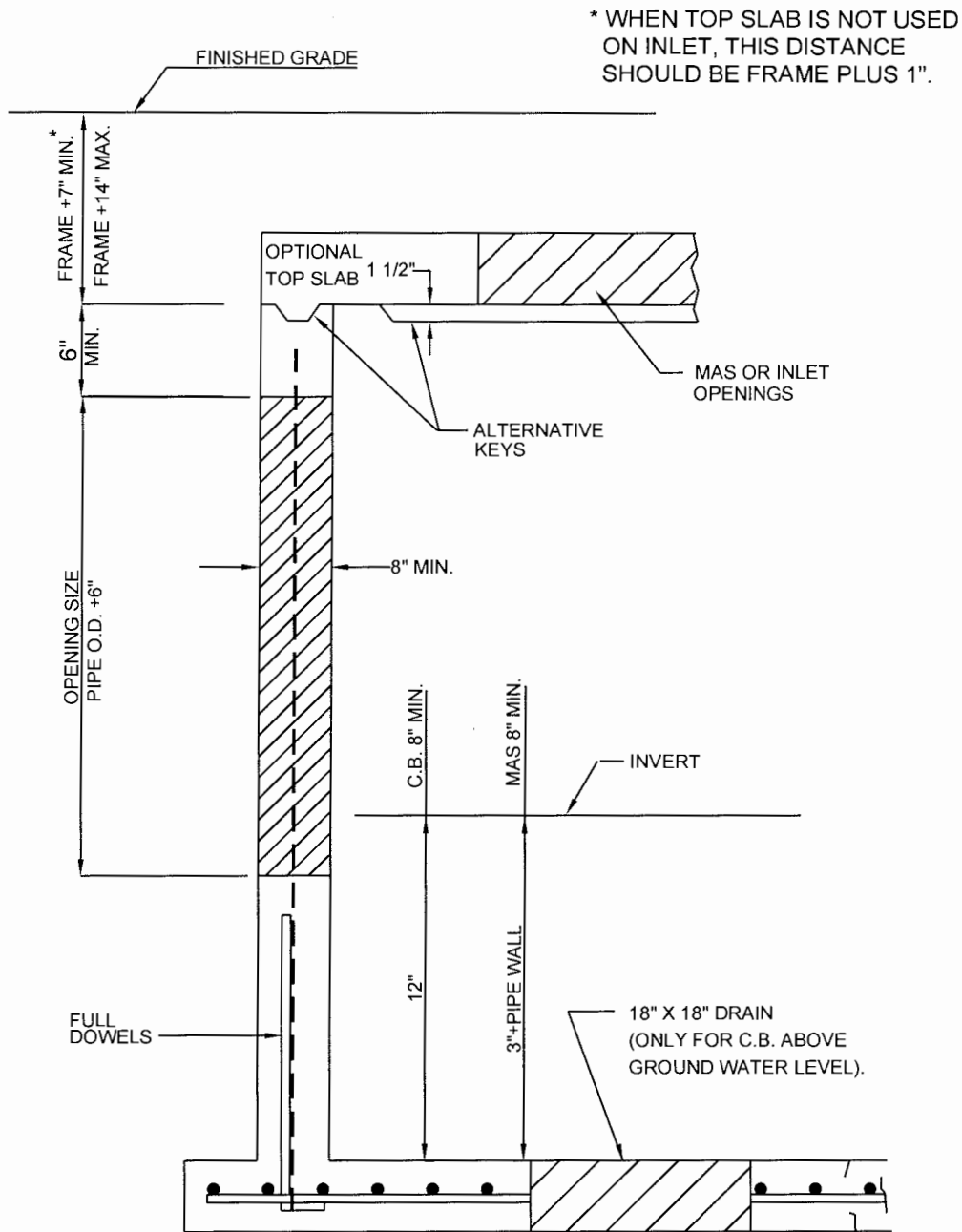
1. EQUIVALENT STONE SHALL REPLACE DISTURBED ROCK (1" TO 2" WASHED ROCK).
2. THE RESTORATION OF THE EXISTING TRENCH SHALL OVERLAP THE CUT WITH NEW NON-WOVEN FILTER FABRIC AND EXTEND BEYOND THE CUT BY 1 FOOT.
3. BOTTOM OF CUT SHALL ALSO BE REPAIRED WITH OVERLAPPING FABRIC.
4. INTRODUCTION OF SAND AND SOIL INTO THE EXPOSED FRENCH DRAIN ROCK SHALL BE AVOIDED.
5. SOIL SURROUNDING THE TRENCH SHALL BE COMPACTED IN 6" LIFTS, OR PER TRENCH RESTORATION DETAIL.
6. STAINLESS STEEL BANDING SHALL BE USED TO SECURE THE FILTER FABRIC TO THE SLEEVE.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

EXFILTRATION TRENCH AND
CONFLICT PIPE DETAIL

Approved by: DJH
Revised: 6/01/05 WRH

18
DWG. NO.



NOTES:

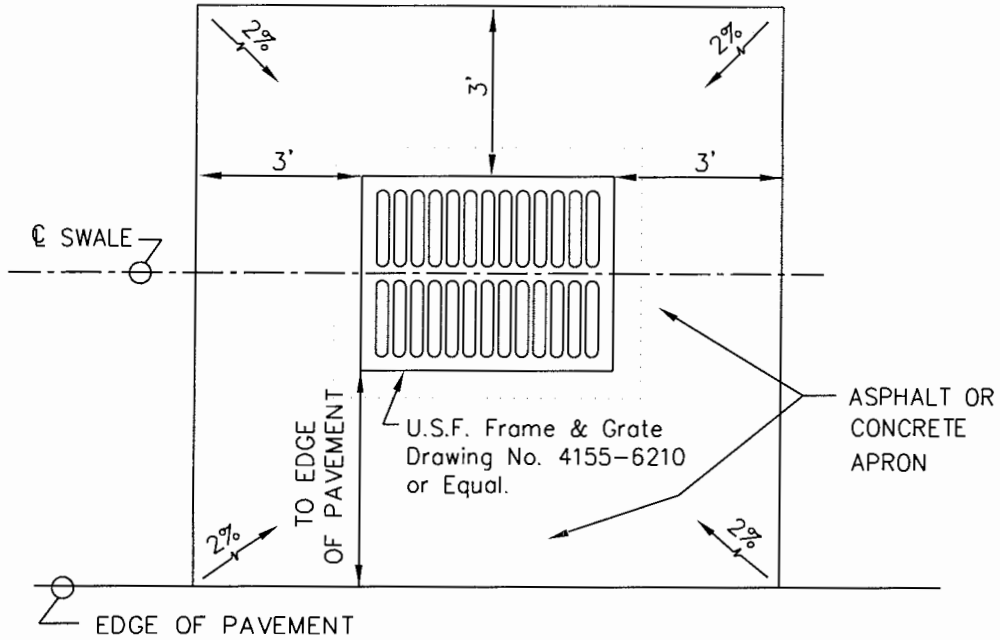
1. ALL DRAINAGE STRUCTURES SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF ASTM STANDARD NO. C-478 AND CHAPTER 6, SECTION 6-1.13.3 OF THIS DOCUMENT.
2. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 4000 P.S.I. IN 28 DAYS.
3. ROCK AND/OR FILTER FABRIC SHALL BE PLACED UNDER ALL DRAINAGE STRUCTURES AS DIRECTED BY THE HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

TYPICAL DRAINAGE
STRUCTURE DETAILS

Approved by: DJH
Revised: 6/01/05 WRH

19
DWG. NO.



OPTION 1:

Subject to approval by
the Highway Construction
and Engineering Division.

BASE:

6" COMPACTED
LIMEROCK

PLAN

1" ASPHALT
(TYPE 1)

SECTION

OPTION 2:

6" CONCRETE
(3000 PSI)

BASE:

COMPACTED
SUBGRADE

CATCH BASIN SWALE
INSTALLATION WITH APRON

N.T.S.

NOTES:

COMPACTED LIMEROCK BASE SHALL MEET 98%
MAXIMUM DRY DENSITY PER AASHTO T-180.

SUBGRADE BENEATH CONCRETE SHALL MEET 100%
MAXIMUM DRY DENSITY PER AASHTO T-180.

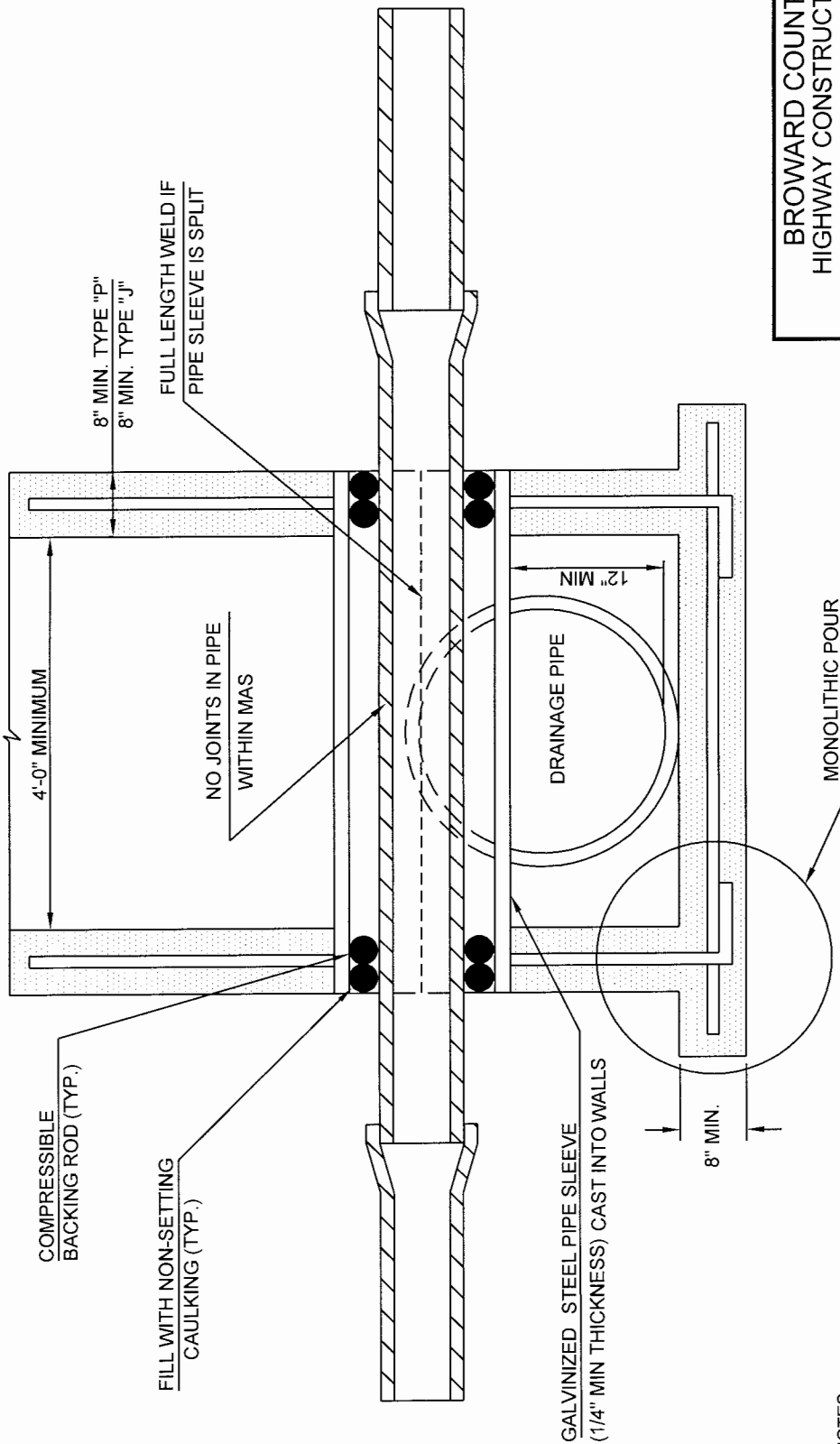
APRON TO BE 3' MINIMUM ON THREE SIDES, WITH
FOURTH SIDE EXTENDED TO EDGE OF PAVEMENT.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

CATCH BASIN
APRON

Approved by: DJH
Revised: 6/01/05 WRH

20
DWG. NO.



COMPRESSIBLE BACKING ROD (TYP.)

FILL WITH NON-SETTING CAULKING (TYP.)

4'-0" MINIMUM

8" MIN. TYPE "P"
8" MIN. TYPE "J"

FULL LENGTH WELD IF PIPE SLEEVE IS SPLIT

NO JOINTS IN PIPE WITHIN MAS

GALVANIZED STEEL PIPE SLEEVE (1/4" MIN THICKNESS) CAST INTO WALLS

DRAINAGE PIPE

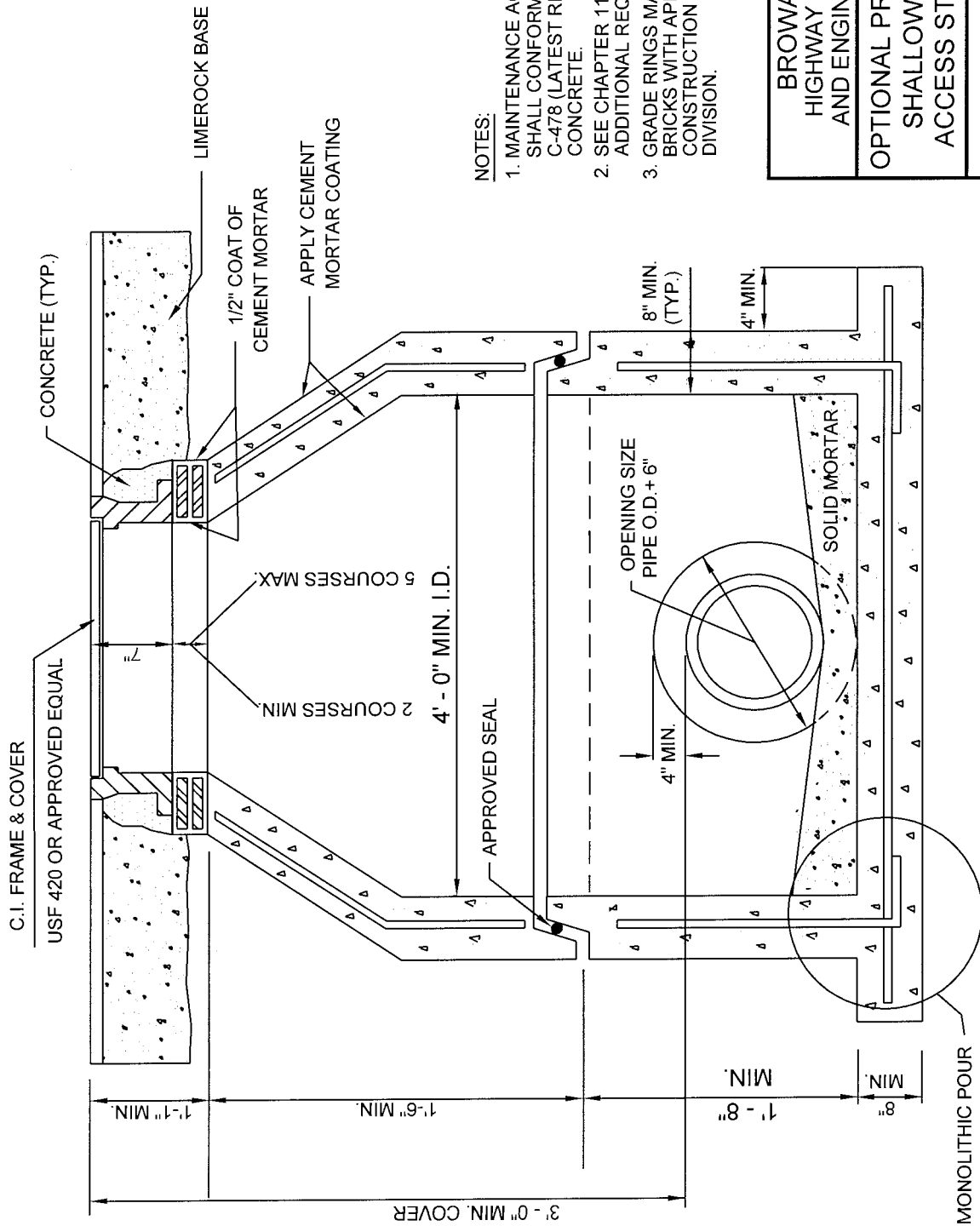
12" MIN

MONOLITHIC POUR

8" MIN.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
CONFLICT STRUCTURE DETAIL	
Approved by: DJH	21
Revised: 6/01/05 WRH	DWG. NO.

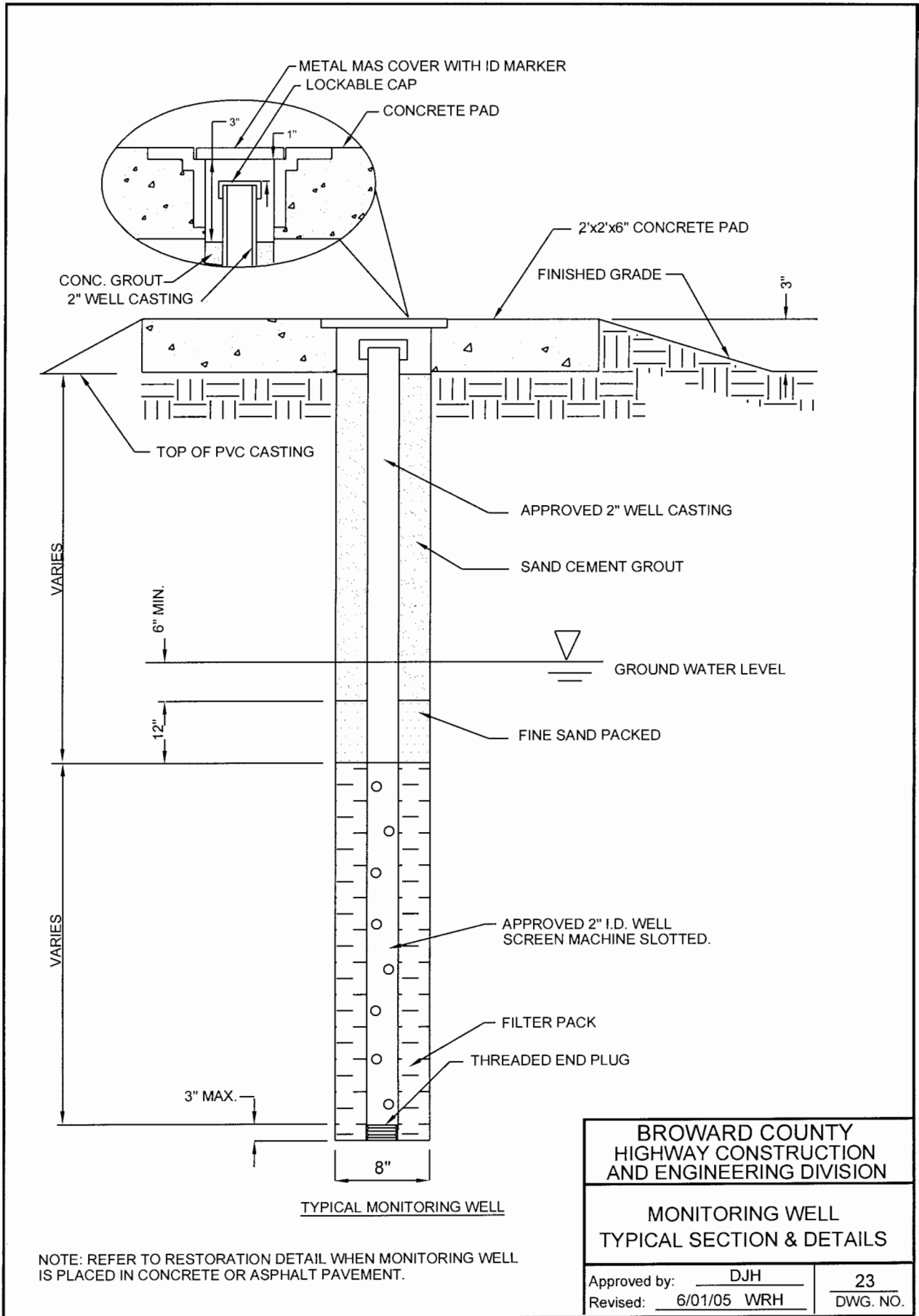
- NOTES:
1. ALL CONFLICT STRUCTURES SHALL CONFORM TO THE DETAILS SHOWN ON THIS DRAWING, AND TO THE REQUIREMENTS OF ASTM C-478 AND TO CHAPTER 6, SECTION 6-1.13.3 OF THIS DOCUMENT.
 2. POTABLE WATER PIPE SHALL NOT PASS THROUGH OR CONTACT SANITARY SEWER STRUCTURE.
 3. GALVANIZED STEEL PIPE SLEEVE SHALL HAVE A MINIMUM THICKNESS OF 0.25".



NOTES:

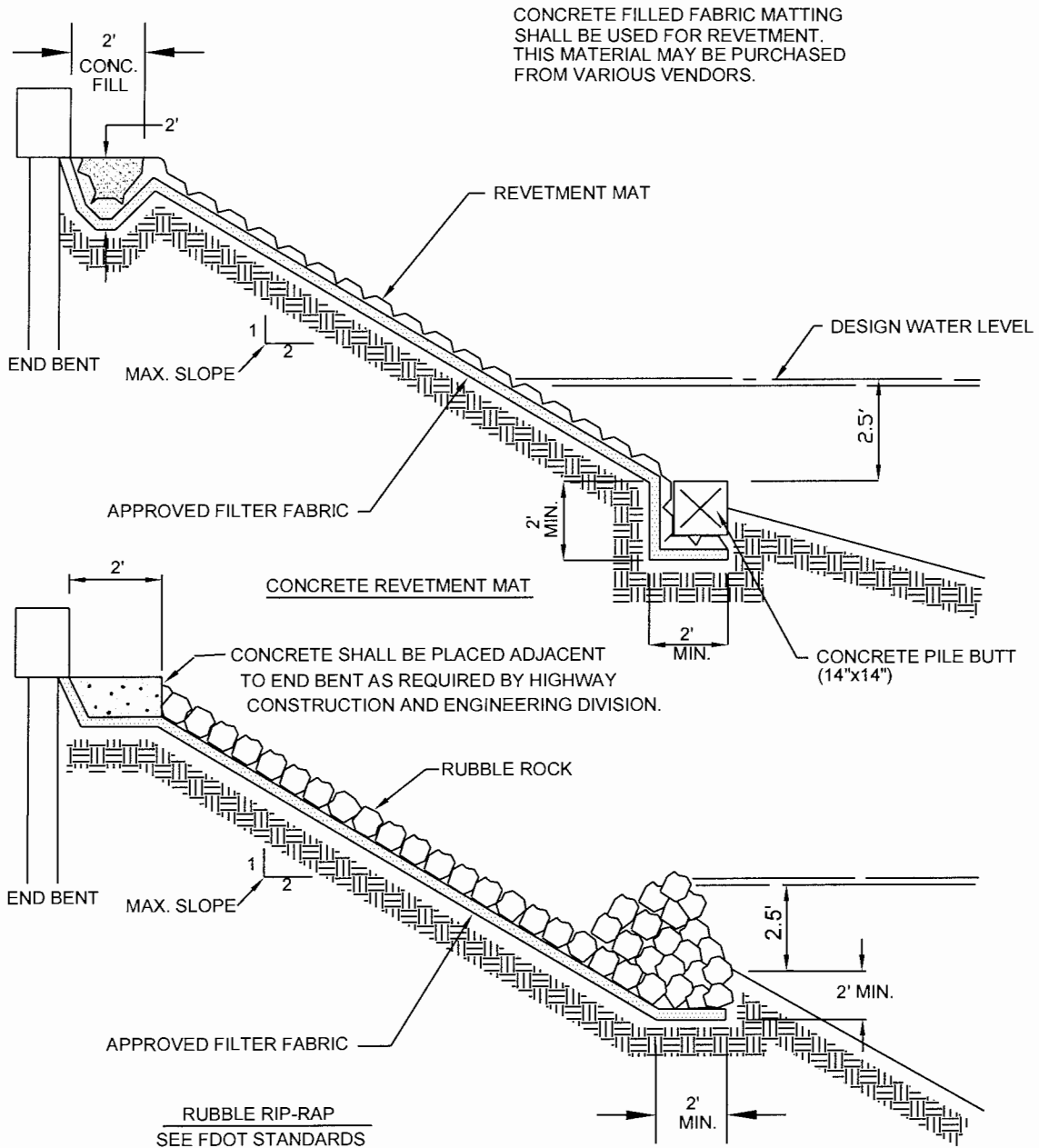
1. MAINTENANCE ACCESS STRUCTURES SHALL CONFORM TO ASTM STANDARD C-478 (LATEST REVISION) FOR PRECAST CONCRETE.
2. SEE CHAPTER 11, SEC. 11-2, FOR ADDITIONAL REQUIREMENTS.
3. GRADE RINGS MAY BE USED IN LIEU OF BRICKS WITH APPROVAL BY THE HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
OPTIONAL PRECAST CONCRETE SHALLOW MAINTENANCE ACCESS STRUCTURE DETAIL	
Approved by: <u> DJH </u>	22
Revised: <u> 6/01/05 </u> <u> WRH </u>	DWG. NO.



NOTE: REFER TO RESTORATION DETAIL WHEN MONITORING WELL IS PLACED IN CONCRETE OR ASPHALT PAVEMENT.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
MONITORING WELL TYPICAL SECTION & DETAILS	
Approved by: <u> DJH </u>	<u> 23 </u>
Revised: <u> 6/01/05 </u> <u> WRH </u>	<u> DWG. NO. </u>



CONCRETE FILLED FABRIC MATTING SHALL BE USED FOR REVETMENT. THIS MATERIAL MAY BE PURCHASED FROM VARIOUS VENDORS.

NOTE:
SAND-CEMENT RIP RAP IS NOT ACCEPTABLE AS SLOPE PROTECTION.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

SLOPE PROTECTION
AT BRIDGES

Approved by: DJH
Revised: 6/01/05 WRH

 24
DWG. NO.

SEE BCTED WEB PAGE
FOR BRACKETS

ID (D3) MATERIALS

BORDER AND LETTERS

SILVER HIGH INTENSITY GRADES
3870 PRESSURE SENSITIVE

GREEN BACKGROUND

GREEN TRANSLUCENT INK
SILK SCREENED CLEAR COATED
OR ELECTRO-CUT (EC) FILM
1177 GREEN OR EQUIVALENT.

R1-1 (30"x30") THE TOP
OF THE STOP SIGN SHALL
BE MOUNTED FLUSH TO THE
TOP OF THE POST. ANY SIGN
INSTALLED BACK TO BACK WITH
THE STOP SIGN, SHALL BE
SMALLER THAN THE STOP SIGN.



STOP, DO NOT ENTER, YIELD

DIAMOND GRADE (3M VIP
3990 WHITE).
PRESSURE SENSITIVE RED
TRANSLUCENT INK SILK
SCREENED CLEAR COATED
OR EC FILM 1172 RED OR
EQUIVALENT OVER DIAMOND
GRADE.

SUPPLEMENTAL

DO NOT ENTER
R3-5R (24"x30")

STANDARD CHANNEL SIGN POST

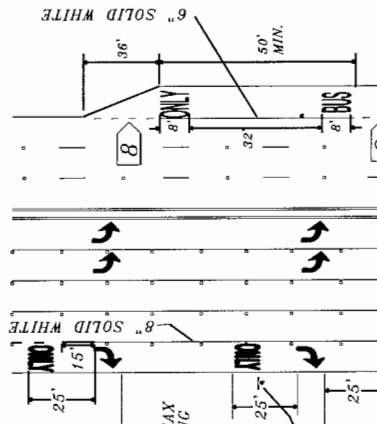
12', 3#/FT
FLANGED U-CHANNEL TYPE
PAINTED GREEN

STOP SIGN AND STREET IDENTIFICATION ASSEMBLY

TYPICAL DETAILS

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
STOP SIGN AND STREET IDENTIFICATION ASSEMBLY TYPICAL DETAILS	
Approved by: <u>DJH</u>	<u>25</u>
Revised: <u>6/01/05 WRH</u>	DWG. NO.

DROP LANE LENGTH	
V_u	RECOMMEND PREFER
40-45mph	MINIMUM 600'
30-35mph	400'
	600'



"RIGHT LANE MUST TURN RIGHT" SIGN (R3-7) TO BE PLACED AT FIRST "ONLY" PAVEMENT MARKING. ADDITIONAL R3-7 SIGNS MUST BE PLACED AT ALTERNATING "ONLY" PAVEMENT MARKINGS.

LEGEND

1 AMBER/AMBER RPM DETAILS

3 PAINTED MEDIAN DETAILS

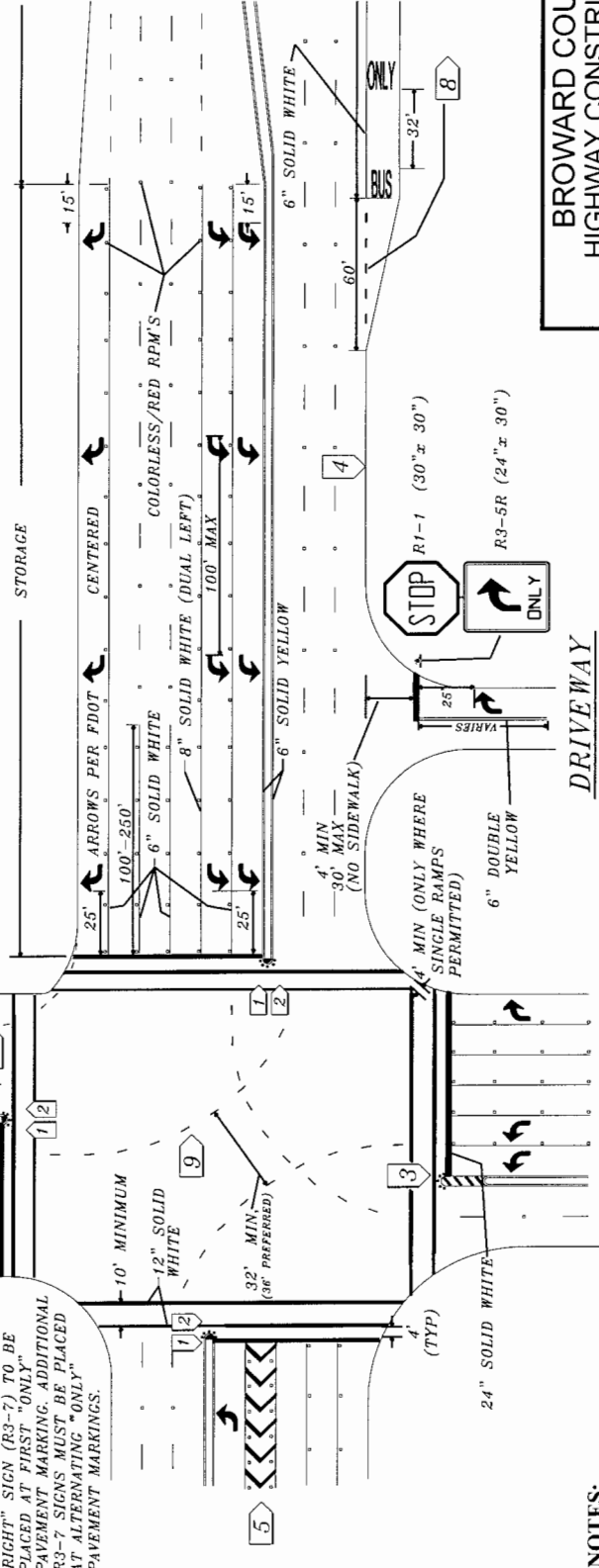
5 CHEVRON DETAILS

2 MEDIAN NOSE PAINT DETAILS

4 EDGE LINE DETAILS

6 STREET NAME BLADE DETAILS

ALL D-3's SHALL HAVE 9" BLADES WITH A 1/2" WHITE BORDER AND 6" SERIES "C" HIGHWAY GOTHIC LETTERS.



NOTES:

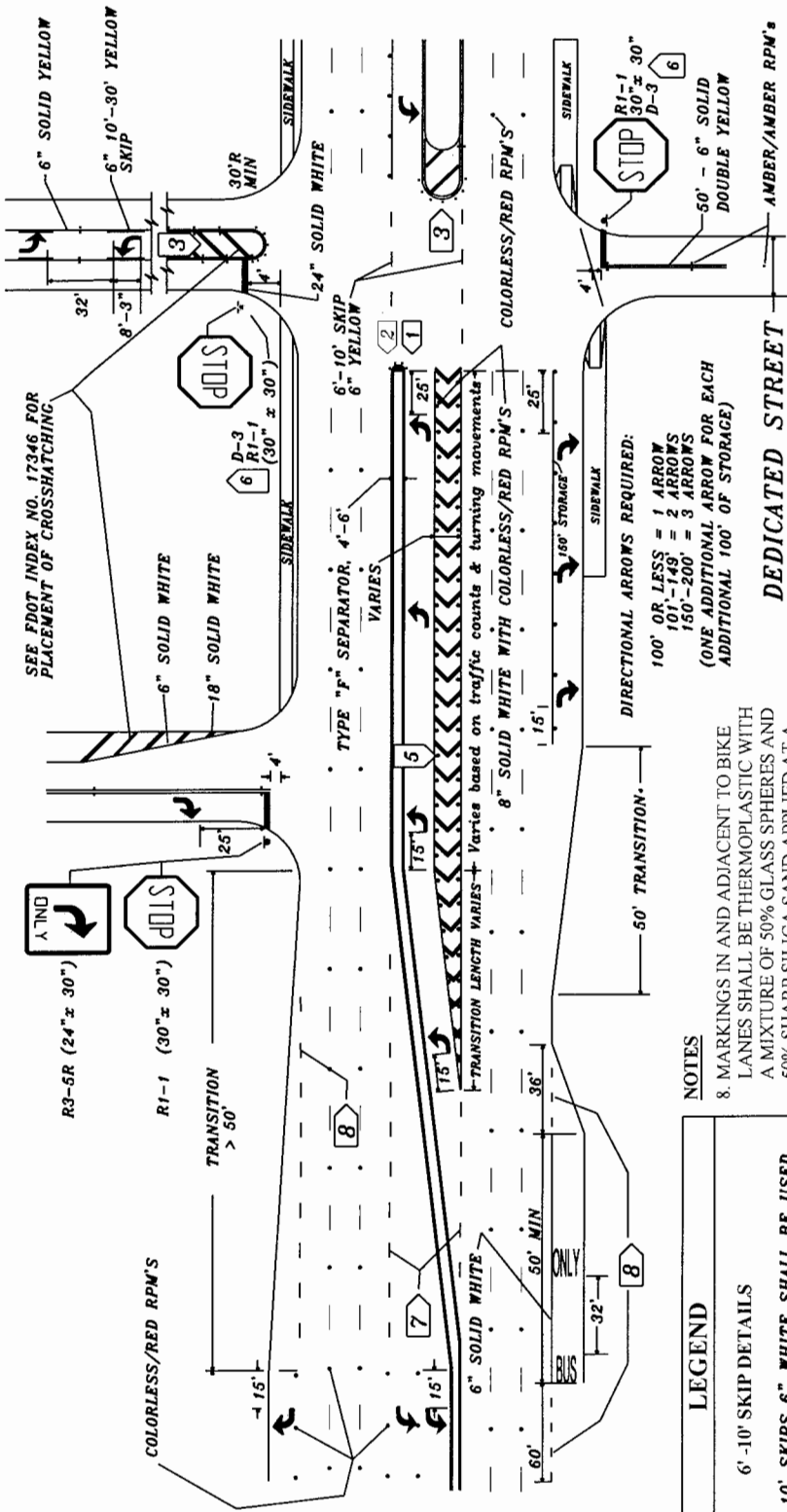
1. ALL PAVEMENT MARKINGS SHALL BE ALKYD BASED THERMOPLASTIC AND FULLY RETROREFLECTORIZED.
2. ALL PAVEMENT MARKINGS ON PAVEMENT SYSTEMS SHALL BE 3M 5730/31 TAPE AND APPLIED WITH AN E44 CONTACT CEMENT AS PER MANUFACTURER'S SPECIFICATIONS.
3. ALL PAVEMENT MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
4. SEE FDOT INDEX NO. 17352 FOR PLACEMENT OF RPM'S. (FOR BULLNOSE RPM TREATMENT, SEE LEGEND NO. 1)
5. RPM'S SHALL BE CLASS "B" 911 OR EQUIVALENT, APPLIED WITH EPOXY OR BITUMINOUS ADHESIVE.
6. FDOT APPROVED SEALER SHALL BE USED WHEN APPLYING MARKINGS ON CONCRETE.
7. FOR BIKE LANE DETAILS SEE FDOT INDEX NO. 17346.

**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

**PAVEMENT MARKINGS AND
SIGNS - DETAIL SHEET**

Approved by: DJH 26
 Revised: 6/01/05 WRH DWG. NO.

TWO-WAY LEFT TURN LANE



SEE FOOT INDEX NO. 17346 FOR PLACEMENT OF CROSSHATCHING.

LEGEND	
	6' - 10' SKIP DETAILS
	2' - 4' SKIP DETAILS
	TYPE IV SEPARATOR DETAILS

NOTES

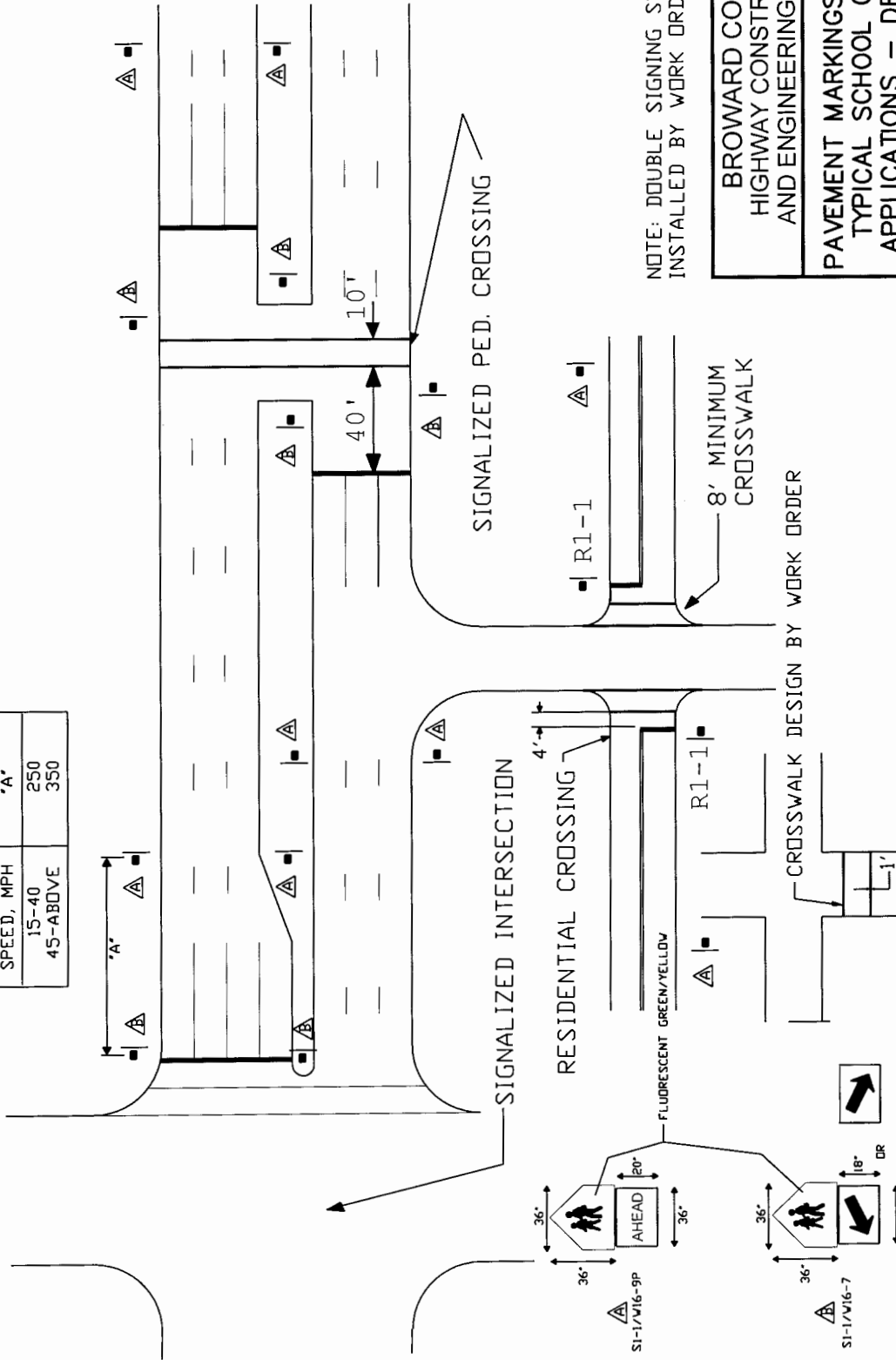
- MARKINGS IN AND ADJACENT TO BIKE LANES SHALL BE THERMOPLASTIC WITH A MIXTURE OF 50% GLASS SPHERES AND 50% SHARP SILICA SAND APPLIED AT A RATE OF 0.2 LBS. PER SQUARE FOOT.
- EXISTING MARKINGS SHALL BE REMOVED BY WATER BLASTING OR SAND BASTING ONLY.
- ALL STOP BARS SHALL BE 4' BEHIND CROSSWALK OR SIDEWALK.

**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

**PAVEMENT MARKINGS AND
SIGNS - DETAIL SHEET**

Approved by: DJH DWG. NO. 26
Revised: 6/01/05 WRH

APPROACH SPEED, MPH	DISTANCE "A"
15-40	250
45-ABOVE	350



SIGNALIZED PED. CROSSING

SIGNALIZED INTERSECTION

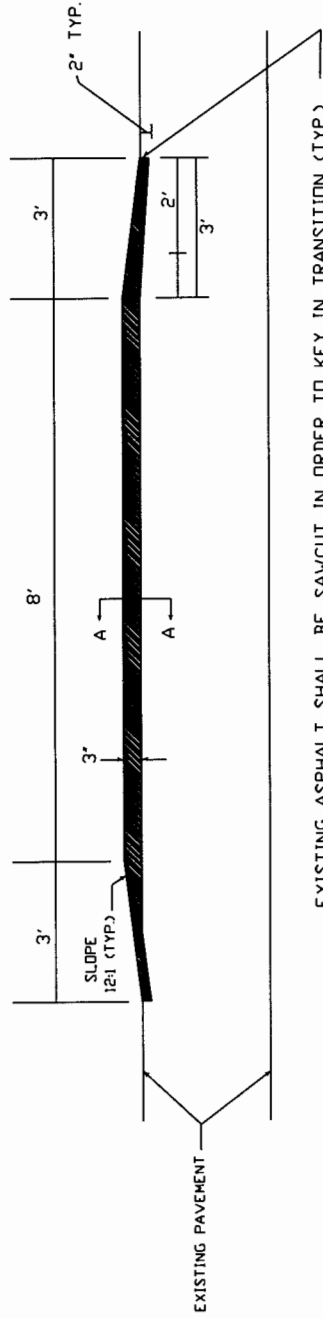
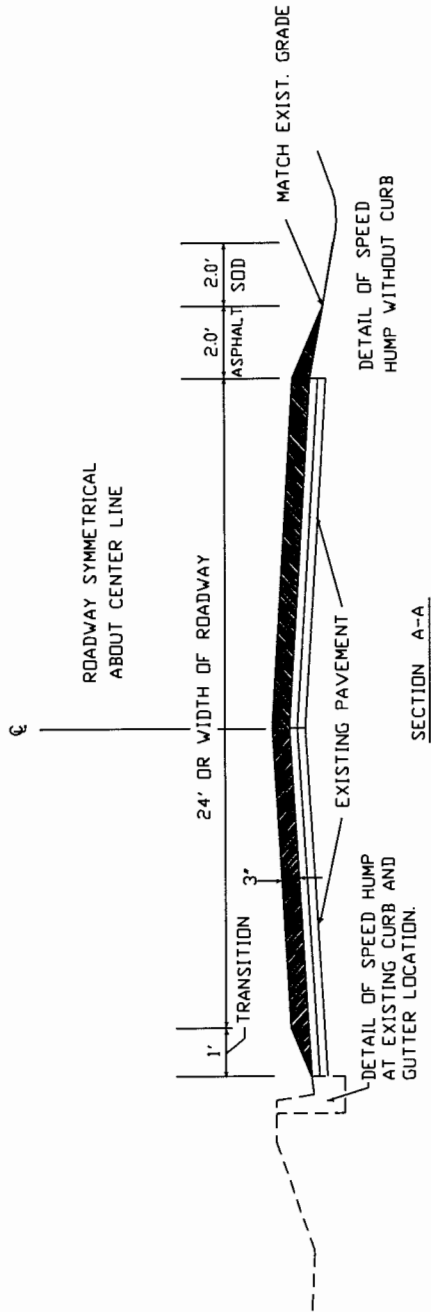
RESIDENTIAL CROSSING

NOTE: DOUBLE SIGNING SHALL BE INSTALLED BY WORK ORDER REQUEST.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

PAVEMENT MARKINGS AND SIGNS
TYPICAL SCHOOL CROSSING
APPLICATIONS - DETAIL SHEET

Approved by: DJH 27
Revised: 6/01/05 WRH DWG. NO.



***NOTE:**

PRIOR TO INSTALLATION OF SPEED HUMP AND NEW CURB AND GUTTER DRAINAGE FEATURES SHALL BE INVESTIGATED.

CONSTRUCTION MATERIALS

THE SPEED HUMP CAN BE PRECAST CONCRETE SECTIONS, CONCRETE CAST ON SITE, ASPHALT OR BRICK/CONCRETE PAVERS.

BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION

**SPEED HUMP
DETAIL**

Approved by: DJH 28
Revised: 6/01/05 WRH DWG. NO.

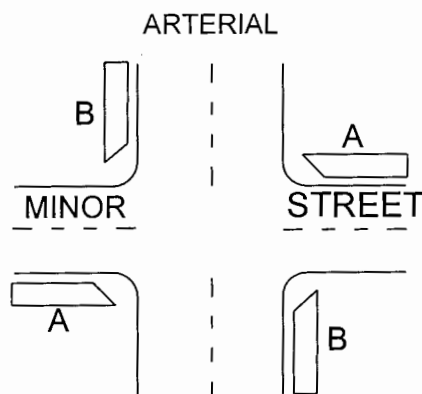
TRAFFIC ENGINEERING DIVISION TRAFFIC SIGNAL SECTION

(Guidelines for Controller Cabinet Location)

Ground mounted cabinets are preferred over both pole and pedestal mounted cabinets. Use ground mounted cabinets if possible.

The following criteria shall apply to the physical location of the cabinet. The criteria are listed in order of relative importance from most important to least important consideration:

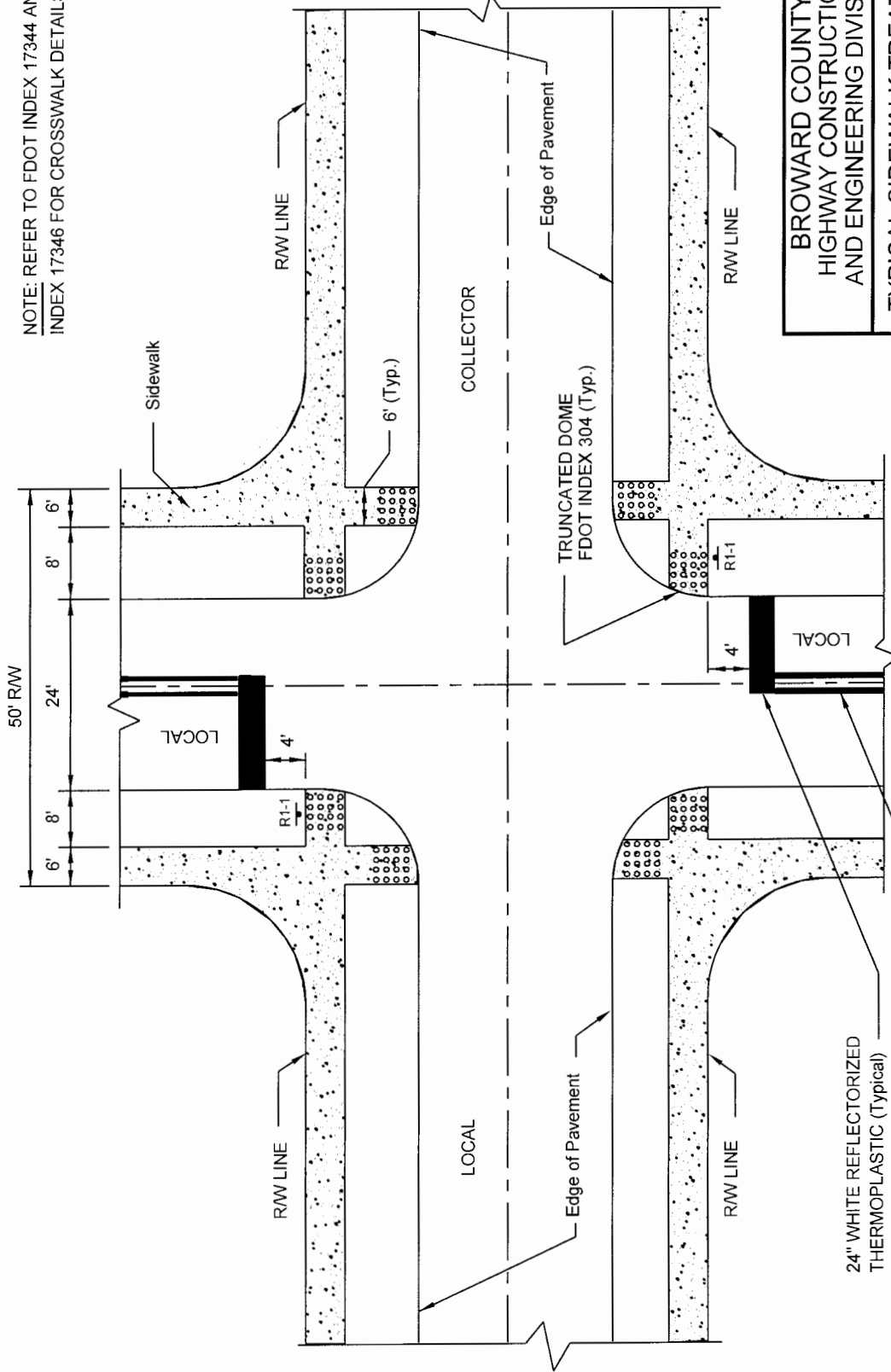
1. Place the cabinet in the position that minimizes its chance of being struck by an out-of-control vehicle. Keep in mind that a vehicle usually loses control after entering the intersection and that a left-turning vehicle has a greater chance of losing control than a straight-through or right-turning vehicle.
2. Place the cabinet in a position that shall minimize the chance of flood damage. Avoid placing the cabinet in low places around the intersection.
3. Place the cabinet in a position for which the maximum number of controller phases can be monitored by observation of vehicle and pedestrian signal heads.
4. Place the cabinet in the position that shall maximize its accessibility to Traffic Engineering Department personnel. Select a position near convenient parking. Also select a position where vegetation or steep slopes shall not cause problems.
5. Place the cabinet in a position that shall minimize its chances of suffering lighting damage. Do not place it near objects that may attract lighting, such as tall trees.
6. Place the cabinet in the area of greatest illumination and nearest center of activity, such as service stations and stores. This will increase visibility and safety when working in cabinets after dark. If the nearest pole does not have a street light, make sure a street light request is made.



CONTROLLER LOCATION "A" IS PREFERRED, "B" IS ACCEPTABLE.

BROWARD COUNTY HIGHWAY CONSTRUCTION AND ENGINEERING DIVISION	
CONTROLLER CABINETS LOCATION GUIDELINES	
Approved by: <u> DJH </u>	<u> 29 </u>
Revised: <u> 6/01/05 WRH </u>	<u> DWG. NO. </u>

NOTE: REFER TO FDOT INDEX 17344 AND INDEX 17346 FOR CROSSWALK DETAILS.

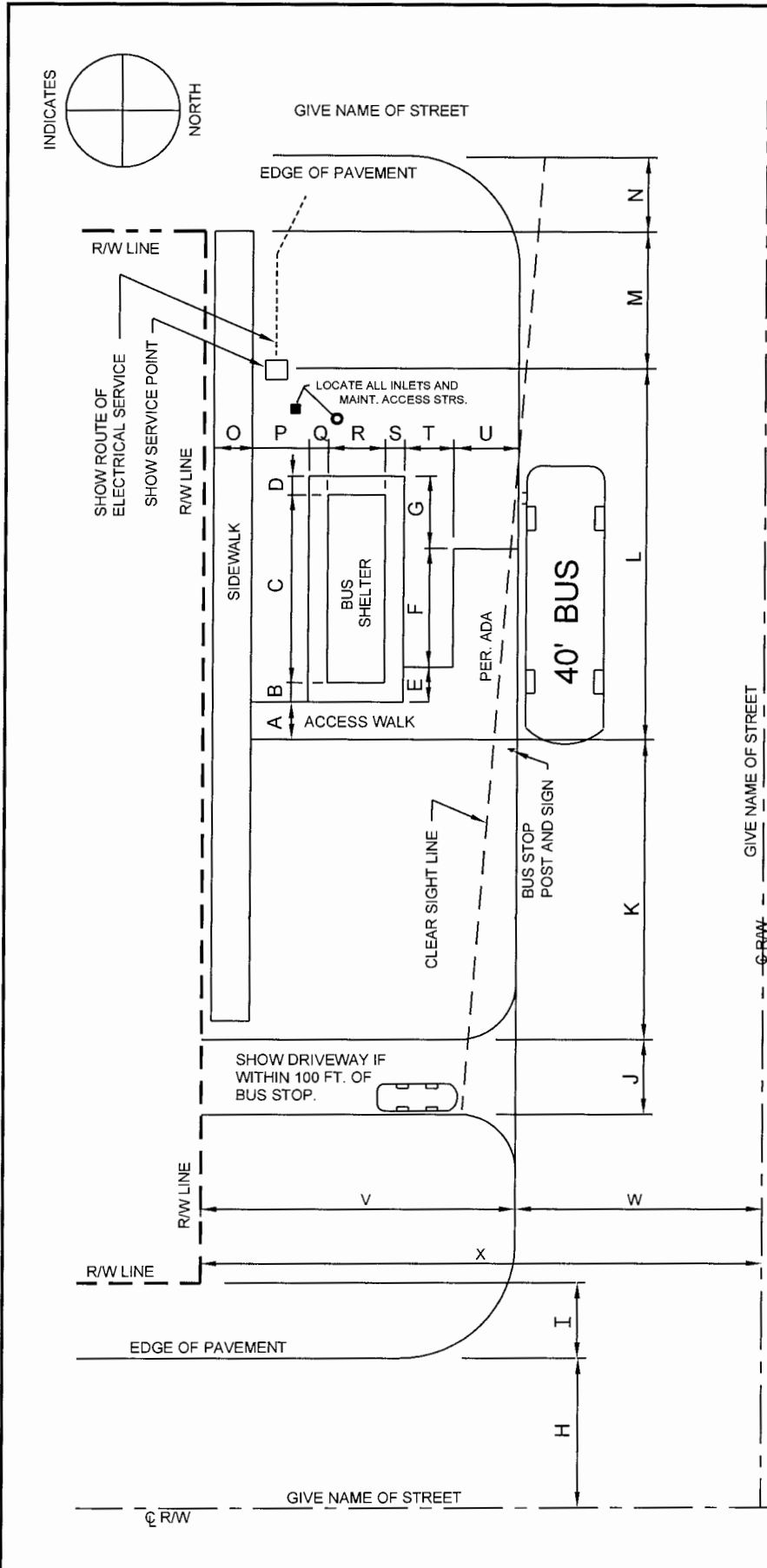


24" WHITE REFLECTORIZED THERMOPLASTIC (Typical)
 6" DOUBLE YELLOW REFLECTORIZED THERMOPLASTIC (Typical)

PLAN
 NTS

BROWARD COUNTY
 HIGHWAY CONSTRUCTION
 AND ENGINEERING DIVISION
 TYPICAL SIDEWALK TREATMENT
 AT INTERSECTION OF
 TWO LOCAL STREETS

Approved by: DJH 30
 Revised: 6/01/05 WRH DWG. NO.



TYPICAL PLAN

Note: For a copy of the FDOT Transit Handbook visit: <http://www.dot.state.fl.us/transit/Pages/AccessingTransitHandbookLow.pdf>

NOTES:

1. SITE PLAN SHALL SHOW ACTUAL SITE CONDITIONS.
2. ALL DIMENSIONS INDICATED ABOVE AS: A, B, C, ETC. SHALL BE SHOWN ON THE PLAN, AS APPLICABLE.
3. SIDEWALK WIDTH SHALL BE 5 FEET MINIMUM.
4. ACCESS WALK WIDTH SHALL MATCH SIDEWALK WIDTH, BUT IN NO CASE BE LESS THAN 5 FEET.

5. THE PREFERRED DIMENSION FOR ADA LANDING PADS IS 30" IN LENGTH (MEASURED PARALLEL TO THE STREET) BY 10" IN DEPTH (MEASURED FROM THE BACK FACE OF THE CURB). HOWEVER, THEY SHALL HAVE A MINIMUM LENGTH OF 8" AND A MINIMUM DEPTH OF 8".

6. ALL TRANSIT ACCESSORY PADS, BUS SHELTERS AND RELATED FACILITIES SHALL MEET ADA REQUIREMENTS AND BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH BROWARD COUNTY "MINIMUM STANDARDS."

**BROWARD COUNTY
HIGHWAY CONSTRUCTION
AND ENGINEERING DIVISION**

**TRANSIT ACCESSORY PAD
SITE PLAN**

REQUIRED INFORMATION

Approved by: DJH 31
 Revised: 6/01/05 WRH DWG. NO.

APPENDIX B
DESIGN CRITERIA RELATED TO HIGHWAY SAFETY
(SEE SHEETS B-7 AND B-8 FOR NOTES)

Type of Facility	Rural & Urban Freeways and Rural Arterial & Collectors: Design speed of 45 mph or greater. Projected ADT (20 yr) of 1500 or greater.
Embankment Slope	<u>Fill Height</u> <u>Embankment Slope</u> 0'- 5' 6:1 5'- 10' 6:1 to edge of CZ & 4:1 10'- 20' 6:1 to edge of CZ & 3:1 Over 20' 2:1 (with guardrail) R/W cost shall be considered in urban areas when using these slopes.
Clear Widths for Bridges (see note 25)	Freeways, Divided Arterials & Collectors (4 or more lanes): Travel lanes plus 10' rt. and 6' lt. Undivided Arterials & Collectors: Travel lanes plus approach shoulder width
Back Slope	4:1 (Normal)
Guard Rail Location	Shoulder width plus 2' to face of guardrail (at shoulder line when shoulder width is 12'). May be desirable to locate on front slope; see Detail K, Index No. 400.
Signs	Not generally in median. Outside clear zone or behind barrier that is justified for other reasons. Cantilever signs may be located inside clear zone protected by barrier. Frangible single column signs to be located in accordance with Traffic Design Standards Index No. 17302. All supports shall be breakaway, or frangible, except overhead cantilever or truss signs.
Light Poles	Not generally in median except when shielded by barrier. Outside clear zone or frangible base 20' from edge of travel lane and 14' minimum from edge of auxiliary lane or behind an approved barrier that is justified for other reasons.
Utility Pole, Fire Hydrant, etc.	Not in median. Not within R/W of the main travel way of freeways. For other facilities outside the clear zone. Normally 6.5' inside R/W when beyond clear zone, otherwise as close as practical to R/W line (see note 15).
Railroad Crossing Device	Not on freeway. 10' min. from edge of travel lane or 6' min. from edge of auxiliary lane to near edge of device. No guardrail (see note 14).
Median Width	Freeways: 60' min 60mph and over (40' min. when lanes added in median) 40' min under 60 mph Other Divided Highways: 40' min 55mph and over 22' min under 55 mph
Trees existing or expect 4" dia. measured 4' above the ground (see note 10).	Outside clear zone. Desirable criteria recommended for freeways (see note 12).

APPENDIX B
DESIGN CRITERIA RELATED TO HIGHWAY SAFETY
(SEE SHEETS B-7 AND B-8 FOR NOTES)

Type of Facility	Rural Arterials & Collectors: Design speed of 45 mph or greater. Projected ADT (20 yr) less than 1500.
Embankment Slope	<u>Fill Height</u> <u>Embankment Slope</u> 0'-5'6:1 except where R/W is not sufficient, then 6:1 to edge of CZ and 3:1 shall be permitted 5'- 20'6:1 to edge of CZ and 3:1, except where R/W is insufficient, then 2:1 with guardrail shall be permitted
Clear Widths for Bridges (see note 25)	Travel lanes plus approach shoulder widths
Back Slope	4:1 where R/W permits, or 3:1
Guard Rail Location	Shoulder width plus 2' to face of guardrail (8' min.). May be desirable to locate on front slope; see Detail K, Index No. 400.
Signs	Outside clear zone or behind barrier that is justified for other reasons. Cantilever signs may be located inside clear zone protected by barrier. Frangible single column signs to be located in accordance with Traffic Design Standards Index No. 17302. All supports shall be breakaway, or frangible, except cantilever or truss signs.
Light Poles	Outside clear zone for both frangible and non-frangible bases if clear zone is 20' feet or less. Desirably 20' feet from edge of auxiliary lane or behind approved barrier that is justified for other reasons. Frangible bases may be placed at 20' from thru lane and 14' from auxiliary lane for clear zones greater than 20'.
Utility Pole, Fire Hydrant, etc.	Outside clear zone. Normally 6.5' inside R/W when beyond clear zone, otherwise as close as practical to R/W line (see note 15).
Railroad Crossing Device	10' min. from edge of travel lane or 6' min. from edge of auxiliary lane to near edge of device. No guardrail (see note 14).
Median Width	22' minimum
Trees existing or expect 4" diameter measured 4' above the ground (see note 10).	Outside clear zone

APPENDIX B

DESIGN CRITERIA RELATED TO HIGHWAY SAFETY

(SEE SHEETS B-7 AND B-8 FOR NOTES)

Type of Facility	Rural Collectors: Design speed of 40 mph or less All Rural Local - All speeds
Embankment Slope	<u>Fill Height</u> <u>Embankment Slope</u> 0'-5'6:1 except where R/W is not sufficient, then 6:1 to edge of CZ and 3:1 shall be permitted 5'- 20'6:1 to edge of CZ & 3:1, except where R/W is insufficient, then 2:1 with guardrail shall be permitted
Clear Widths for Bridges (see note 25)	Travel lanes plus approach shoulder widths
Back Slope	4:1 where R/W permits or 3:1
Guard Rail Location	Shoulder width plus 2' to face of guardrail (8' min.). May be desirable to locate on front slope; see Detail K, Index No. 400.
Signs	Outside clear zone or behind barrier that is justified for other reasons. Cantilever signs may be located inside clear zone protected by barrier. Frangible single column signs to be located in accordance with Traffic Design Standards Index No. 17302. All supports shall be breakaway, or frangible, except cantilever or truss signs.
Light Poles	Outside clear zone or behind barrier that is justified for other reasons
Utility Pole, Fire Hydrant, etc.	Outside clear zone. Not in median. Normally 6.5' inside R/W when beyond clear zone, otherwise as close as practical to R/W line (see note 15).
Railroad Crossing Device	Minimum from edge of travel lane to near edge of device: Greater than 45 mph 10' 35-45 mph 8' 30 mph or less 6' Minimum auxiliary lanes 6' No guardrail (see note 14)
Median Width	19.5' minimum 45-50 mph 15.5' minimum 40 mph or less (Greater widths desirable) For reconstruction projects the min. painted median width with provisions for left turn is 10' (greater widths desirable).
Trees existing or expect 4" diameter measured 4' above the ground (see note 10).	Outside clear zone

APPENDIX B

DESIGN CRITERIA RELATED TO HIGHWAY SAFETY

(SEE SHEETS B-7 AND B-8 FOR NOTES)

Type of Facility	Urban Arterials & Collectors: Design speed of 30-50 mph (without curb and gutter)						
Embankment Slope	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"><u>Fill Height</u></td> <td><u>Embankment Slope</u></td> </tr> <tr> <td>0'-5'</td> <td>6:1 except where R/W is not sufficient, then 6:1 to edge of CZ and 3:1 shall be permitted</td> </tr> <tr> <td>5'- 20'</td> <td>6:1 to edge of CZ & 3:1, except where R/W is insufficient, then 2:1 with guardrail shall be permitted</td> </tr> </table>	<u>Fill Height</u>	<u>Embankment Slope</u>	0'-5'	6:1 except where R/W is not sufficient, then 6:1 to edge of CZ and 3:1 shall be permitted	5'- 20'	6:1 to edge of CZ & 3:1, except where R/W is insufficient, then 2:1 with guardrail shall be permitted
<u>Fill Height</u>	<u>Embankment Slope</u>						
0'-5'	6:1 except where R/W is not sufficient, then 6:1 to edge of CZ and 3:1 shall be permitted						
5'- 20'	6:1 to edge of CZ & 3:1, except where R/W is insufficient, then 2:1 with guardrail shall be permitted						
Clear Widths for Bridges (see note 25)	<p>Divided: Travel lanes plus approach shoulder width rt. and 6' lt., unless full median section is carried across structure</p> <p>Undivided: Travel lanes plus approach shoulder width</p>						
Back Slope	4:1 where R/W permits or 3:1						
Guard Rail Location	Shoulder width plus 2' to face of guardrail (8' min.)						
Signs	Outside clear zone or behind barrier that is justified for other reasons. Cantilever signs may be located inside clear zone protected by barrier. Frangible single column signs to be located in accordance with Traffic Design Standards Index No. 17302. All supports shall be breakaway, or frangible, except cantilever or truss signs.						
Light Poles	Outside clear zone or behind approved barrier that is justified for other reasons. Frangible bases may be placed at 20' from thru lane and 14' from auxiliary lane for clear zones greater than 20'.						
Utility Pole, Fire Hydrant, etc.	Outside clear zone. Not in median. Normally 6.5' inside R/W when beyond clear zone, otherwise as close as practical to R/W line.						
Railroad Crossing Device	<p>Minimum from edge of travel lane to near edge of device:</p> <p style="padding-left: 20px;">Greater than 45 mph 10'</p> <p style="padding-left: 20px;">35-45 mph 8'</p> <p style="padding-left: 20px;">30 mph or less 6'</p> <p>Minimum auxiliary lanes 6'</p> <p>No guardrail (see notes 13 & 14).</p>						
Median Width	<p>19.5' minimum 45-50 mph</p> <p>15.5' minimum 40 mph or less</p> <p>(Greater widths desirable)</p> <p>For reconstruction projects the min. painted median width with provisions for left turn is 10' (greater widths desirable).</p>						
Trees existing or expect 4" diameter measured 4' above the ground (see note 10).	Outside clear zone.						

APPENDIX B
DESIGN CRITERIA RELATED TO HIGHWAY SAFETY
(SEE SHEETS B-7 AND B-8 FOR NOTES)

Type of Facility	Urban Arterials & Collectors: Design speed of 45 mph or less (curb and gutter)
Embankment Slope	<u>Fill Height</u> <u>Embankment Slope</u> 0'-20'.....2:1 or to suit property owner, not flatter than 6:1 R/W cost shall be considered for high fill sections in urban areas.
Clear Widths for Bridges (See note 25)	Full Section (face to face of curb) plus sidewalk. When concrete barrier wall is placed in front of sidewalk a minimum clearance of 2.5' is required between the travel lane or bicycle lane and the toe of the barrier wall.
Back Slope	2:1 or to suit property owner, Not flatter than 6:1.
Guard Rail Location	Normally flush with face of curb
Signs	2' minimum from face of curb to inside edge of sign panel. Placement shall not block sidewalk.
Light Poles	4' minimum from face of curb (see note 8)
Utility Pole, Fire Hydrant, etc.	Not in median. 4' minimum from face of curb (see note 8)
Railroad Crossing Device	2.5' from face of curb to near edge of device
Median Width	No minimum.
Trees existing or expect 4" diameter measured 4' above the ground (see note 10).	4' minimum from face of curb when curb height is 6" or greater (see note 11).

APPENDIX B
DESIGN CRITERIA RELATED TO HIGHWAY SAFETY
DESIGN SPEED - CLEAR ZONE (CZ) REQUIREMENTS
(See Notes 16, 17, 18, & 24)

Rural & Urban Freeways and Rural Arterial & Collectors: Design speed of 45 mph or greater. Projected ADT (20 yr) of 1500 or greater.

Design Speed(mph)	MINIMUM		DESIRABLE	
	Travel Lane	Auxiliary Lanes and Ramps	Travel Lane	Auxiliary Lanes and Ramps
60-70	30'	18'	36'	24'
55	24'	14'	30'	18'
45-50	18' (see Note 19)	14' (see Note 19)	24'	14'

Rural Arterials & Collectors: Design speed of 40 mph or greater. Projected ADT (20 yr) less than 1500.

Design Speed(mph)	MINIMUM		DESIRABLE	
	Travel Lane	Auxiliary Lanes and Ramps	Travel Lane	Auxiliary Lanes and Ramps
60-70	24'	14'	30'	18'
55	18'	14'	24'	14'
45-50	14'	14'	20'	14'

Rural Collectors: Design speed of 40 mph or less. All Rural Local - All speeds.

14' Desirable. 10' minimum from edge of both travel & auxiliary lane.

Urban Arterials & Collectors: Design speed of 30-50 mph (without curb and gutter)

Design Speed(mph)	MINIMUM		DESIRABLE	
	Travel Lane	Auxiliary Lanes and Ramps	Travel Lane	Auxiliary Lanes and Ramps
50	18'	10'	24'	14'
45	18' (see notes 20 & 22)	10'	24'	14'
30-40	14' (see notes 21 & 22)	6' (see Note 23)	18'	10'

Urban Arterial & Collectors: Design speed of 45 mph or less (curb and gutter).

4' from face of curb (see note 8). Bridge piers normally shall be 16' minimum from edge of travel lane (see note 9).
--

APPENDIX B

DESIGN CRITERIA RELATED TO HIGHWAY SAFETY - NOTES

1. Design speed shall be established using realistic anticipated operating speed.
2. Preferred ditch cross sections are shown on pages 3-9 and 3-10 of the Roadside Design Guide.
3. Consideration should be given to maintaining greater than the specified clearance slopes where feasible and practical.
4. Values shown in the tables shall be used on all new construction and on all reconstruction projects to the extent that economic and environmental considerations and R/W limitations shall allow. For definitions of new construction and reconstruction see the latest edition of FDOT "Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways." The values shown in the tables do not apply to RRR projects. Driving lane is any traffic lane, travel or auxiliary.
5. An Auxiliary Lane is that portion of the roadway adjoining the traveled way for parking, speed changes, turning, storage for turning, weaving, truck climbing, or for other purposes supplemental to thru traffic movement.
6. Traveled Way (Travel Lanes) is the portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.
7. On projects where the four (4) foot minimum offset cannot be reasonably obtained and other alternatives are deemed impractical, the minimum may be reduced to two and one-half (2.5) feet.
8. At locations where immediately adjacent development such as buildings, etc., provide less clearance, bridge piers can be placed to provide clearance less than sixteen (16) feet. Adequate sight distance for crossing maneuvers at intersections should be provided.
9. Offsets shown are for existing or newly planted trees. If existing trees are close to, but less than the minimum offset indicated, other factors should be considered to determine adequacy of offset, i.e. ADT; operating speed, accident history, size, age and type of tree; protection by a barrier, etc. Newly planted trees may be placed behind barriers that are provided for other reasons. The minimum setback distance from the back of concrete barriers, walls, abutments or other rigid obstructions is 4' for newly planted trees. For W-beam guardrail the minimum setback is 6' from the face of the rail for newly plants. Offset shown apply to both outside and median highways unless otherwise noted. When trees are planted in median, adequate sight distance at intersections, turnouts and median openings, etc., shall be maintained.
10. Ten (10) feet minimum from driving lane when curb height is less than six (6) inches, or when curb height has been reduced by resurfacing.
12. When offset is established, care shall be taken to avoid blocking sight distance to roadside signs.

APPENDIX B

DESIGN CRITERIA RELATED TO HIGHWAY SAFETY - NOTES (Continued)

13. For divided facilities with curbed medians and undivided facilities utilizing curbed separations at crossings, two and one-half (2.5) feet from face of curb to near edge of signal device in accordance with Traffic Design Standards Index No. 17882.
14. Not less than two (2) feet from edge of any shoulder pavement.
15. Avoid encroachment on adjacent private property. The six and one-half (6.5) feet offset is to eliminate aerial encroachment.
16. Standard values are to be used for all new construction projects. These values may be reduced only where individually justified to mitigate critical social, economical and environmental impacts or to lessen excessive right-of-way costs. Standard values are also to be used for reconstruction projects: however, values less than desirable down to AASHTO minimum may be used where individually justified due to critical, social, economical, and environmental impacts and/or excessive right-of-way costs or when existing roadside obstacles are not considered hazardous as evidenced by field review and by accident history or accident potential
17. Where accident history indicates need, or where specific site investigation shows definitive accident potential, clear zones for rural and urban facilities (without curb) may be justified on the outside of horizontal curves in accordance with applicable clear zone requirements.
18. The use of barriers or other safety treatment is to be considered if clear zone requirements are not provided.
19. Ten (10) feet in median where Type-E curb is used on rural collectors with a design speed of 45 mph.
20. May be reduced to low speed condition criteria (30-40 mph) if conditions more nearly approach those for low speed.
21. May be reduced to ten (10) feet for collectors.
22. Ten (10) feet in medians where Type-E curb is used; four (4) feet from face of median curb where curb height is six (6) feet.
23. Four (4) feet from face of median curb where curb height is six (6) inches.
24. When a front slope steeper than 4:1 encroaches into the clear zone a clear runoff area is to be provided at the bottom of the slope in accordance with the latest edition of the "Roadside Design Guide."
25. See "Structures Design Guidelines," latest edition, for further details.

APPENDIX C

PRECONSTRUCTION MEETING

Representation: The Highway Construction and Engineering Division shall determine required representation for the meeting. In general, the following individuals need to be present unless instructed otherwise by the Highway Construction and Engineering Division:

- The permittee, or a representative of the permittee
- Each Subcontractor, or a representative of the Subcontractor
- The Engineer of Record, or a representative of the Engineer of Record
- A representative from the Highway Construction and Engineering Division
- A representative from the Traffic Engineering Division
- A representative of the utility owner, if deemed necessary
- The owner, or the owner's representative, if deemed necessary
- Representatives of other agencies, as deemed necessary

Required Documents: The permittee is required to have the following items at the meeting:

- A copy of the Highway Construction and Engineering Division Permit
- A copy of the "Approved Plan," stamped by the Highway Construction and Engineering Division
- A copy of the approved Maintenance of Traffic Plan
- A copy of the approved Pavement Marking and Signage Plan
- A copy of the approved Signalization and Interconnect Plan, if applicable
- A copy of the approved School Flasher Plan, if applicable

Construction Requirements: All construction in public right-of-way shall be performed in accordance with the "Minimum Standards Applicable to Public Right-of-Way under Broward County Jurisdiction," here-in-after referred to as the "Minimum Standards," and the Permit Conditions as listed on the back of the Permit.

Conflict between "Minimum Standards" and Regulatory Agency: If a conflict should arise between the "Minimum Standards" and those of any other regulatory agency for work performed within public right-of-way, the more stringent shall apply, as determined by the Highway Construction and Engineering Division.

Conflict between "Minimum Standards" and Plans: If a conflict should arise between the "Minimum Standards" and the approved plan (for work performed within public right-of-way) the more stringent requirement, as determined by the Highway Construction and Engineering Division shall apply.

Start of Construction: The Highway Construction and Engineering Division requires forty-eight (48) hours advance notice of intent to begin construction within public right-of-way.

Scheduling Inspections or Tests: The Highway Construction and Engineering Division requires twenty-four (24) hours advance notice for scheduling of any inspection(s) or testing within public right-of-way.

Notice to the Highway Construction and Engineering Division: To notify the Highway Construction and Engineering Division of intent to begin work or to schedule an inspection or test, call the Highway Construction and Engineering Division. All scheduling shall be confirmed by the Highway Construction and Engineering Division. Leaving a message on the "voice-mail" system is not considered "scheduling." You shall also leave a return phone number, so that your request can be confirmed.

Witness of Tests and Inspections: All tests and inspections required within public right-of-way shall be witnessed by the following:

- A representative (inspector) of the Highway Construction and Engineering Division
- A representative of the Engineer of Record for the Project
- A representative of the (permitted) Engineering Contractor
- A representative of the testing lab (to perform and certify test results)
- A representative of the facility owner if testing of a public utility is being performed

Work Hours: The normal work hours for Engineering Division inspectors are from 7:30 A.M. to 4:00 P.M., Monday through Friday, except holidays. The normal work hours for Traffic Engineering Division maintenance of traffic technicians are from 7:00 A.M. to 5:00 P.M., Monday through Friday, except holidays. Without prior authorization from the Highway Construction and Engineering Division, Field Operations Supervisor, the permittee shall not be permitted to work outside the normal hours of operation, within public right-of-way, on work requiring Highway Construction and Engineering Division and/or Traffic Engineering Division representatives to be present.

Overtime Authorization: To obtain authorization for overtime operations, a request shall be made in writing by the permittee on a "Request for Overtime Authorization" form. This form can be obtained from the Highway Construction and Engineering Division, Field Operations Section, at 1 North University Drive, Suite 300, Plantation, FL 33324-2038. The form shall be completed by the permittee and submitted to the Highway Construction and Engineering Division, Field Operations Supervisor for authorization. This form supplements Permit Condition No. 21, listed on the back of the "Application for Permit" and the Permit document.

Knowledge of Permit Conditions: The permittee acknowledges when making application for permit that they are aware of all of the Permit Conditions listed on the back of the "Application for Permit" and the actual Permit form. Permit Condition No. 21 states that "In the event it becomes necessary, for any reason, to continue work operations beyond the normal hours of operation for the Division, the permittee whose name appears on the face of this Permit acknowledges commitment to pay the associated Highway Construction and Engineering Division and Traffic Engineering Division charged overtime expenses, prior to requesting a final inspection on the project."

Overtime Inspection Charges: Overtime inspection charges shall be recorded by the Highway Construction and Engineering Division and/or Traffic Engineering Division representative on a three (3) part "Inspector Overtime Record" form. The form shall show the permittee name and permit number; the date and time worked; total number of overtime hours charged; the rate at which the time was charged; the total amount charged for the specific overtime occurrence; the location and scope of work being performed by the permittee and a brief description of the reason it was necessary to work outside normal hours of operation.

Retest Fees: A retest fee shall be imposed for any unacceptable (failed) tests. Payment of this fee shall be made at the Highway Construction and Engineering Division offices at 1 North University Drive Suite 300, Plantation, FL 33324-2038, before any subsequent scheduling is done for related portions of the project. The fee may be paid in cash or by check, made payable to "Highway Construction and Engineering Division." A sequentially numbered County fee collection form (receipt) shall be generated to document each transaction.

Responsibility for Actions and Quality of Work: The permittee is the Contractor of Record. As such, that Contractor is solely responsible for the actions, safety, and quality of work of all Subcontractors performing work associated with this permit.

Documents Required to be Onsite at all Times: The following documents shall be onsite at all times during the course of construction:

- A copy of the Highway Construction and Engineering Division Permit
- A copy of the "Approved Plan," stamped by the Highway Construction and Engineering Division
- A copy of the approved Maintenance of Traffic Plan
- A copy of the approved Pavement Marking and Signage Plan
- A copy of the approved Signalization and Interconnect Plan, if applicable
- A copy of the approved School Flasher Plan, if applicable

Conflicts or Proposed Revisions to Plans: Conflicts or proposed revisions to the "Approved Plan" shall be brought to the attention of the Highway Construction and Engineering Division, by the Engineer of Record, or an appointed representative. Conflicts or revisions shall be reconciled in accordance with the requirements of the "Minimum Standards."

Permit Suspension or Revocation: Permit(s) may be suspended or revoked for violation of any of the "Permit Conditions" as listed on the reverse side of the permit, or if work is suspended for a time period in excess of ninety (90) days, unless a prior authorization has been requested and granted by the Highway Construction and Engineering Division.

Required Inspections: Inspections required by the Highway Construction and Engineering Division include, but are not limited to:

- Material sampling to establish soil/rock proctors, or Load Bearing Rating
- De-mucking operations

- Pipe, conduit or cable installation operations
- Trench densities; sub-grade "string line" and densities; first lift limerock and curb pad densities; final lift limerock "boarding" and densities
- Drainage structure, Sewer structure, Lift Station structure certifications
- Drainage inlet and apron forms and steel placement inspection
- Curb, sidewalk, concrete pours and taking of concrete test cylinders
- Sanitary sewer and storm sewer "lamping" and mandrel testing
- Sanitary sewer and storm sewer infiltration and exfiltration testing
- Pressure taps and sleeves, visual and hydrostatic pressure testing
- Base rock prime and sand; asphalt placement and swale restoration
- Preliminary and final public right-of-way inspections

Submittal of Shop Drawings: All shop drawings related to project construction shall be submitted for approval, via the Engineer of Record. No facility may be installed until such shop drawings have been reviewed and approved by the Public Works and Transportation Department

Note: If a product is listed on the Approved Product List, this does not mean that its use is endorsed by the Publics Works and Transportation Department, nor does it imply automatic approval of that product. Approval shall be based on whether it is appropriate for the intended use, and "or equal" products shall be approved on a case-by-case basis.

Submittal of "As-built" Drawings: Unless other provisions are granted by the Highway Construction and Engineering Division, placement of asphalt pavement shall not be authorized until limerock "as-built" drawings have been submitted to the Highway Construction and Engineering Division, via the Engineer of Record. Once the "as-built" drawings have been reviewed and approved, authorization to pave shall be given by the Highway Construction and Engineering Division.

Completion of Construction: When construction is completed, the permittee may request a "preliminary" final inspection. At this time the final "punch list" shall be generated. When the final "Final Certification Package" has been received, via the Engineer of Record, and has been found to be acceptable, the final inspection shall be performed. If all punch list items have been addressed, the project shall be accepted and placed into the one (1) year warranty/ maintenance period.

Final Certification Package: The "Final Certification Package" consists of the following items:

1. A letter of certification signed and sealed by a Professional Engineer, licensed to do work in the State of Florida (the Engineer of Record), stating that the project has been completed in substantial compliance with the approved plans and specifications.
2. One (1) set of "as-built" drawings signed and sealed by a Professional Surveyor and Mapper. The "as-built" drawings shall be on a copy of the approved plans and shall include the elevations and locations of all work performed in public right-of-way. In addition to this hard copy, the Engineer of Record shall submit a

copy of the storage medium containing the information from which the "as-built" drawing was produced. The Highway Construction and Engineering Division criteria for "as-built" drawings and CAD requirements are detailed in Chapter 3, Sections 3-8.2, and 3-8.2.1.

3. A copy of the density reports on all embankment, backfill, subgrade and limerock material used in public right-of-way.
4. An executed "Contractor/Supplier Release of Lien," on the approved County form. A copy of this form shall be supplied to the permittee who shall return the executed form to this office.
5. A letter of acceptance from the Broward County Traffic Engineering Division, approving the pavement marking (thermoplastic) and signing restoration, street lights, traffic signals, pedestrian signals, school flashers, communication conduit/interconnect cable, and all other traffic engineering related items.

Maintenance of Traffic Plan: The provisions of Chapter 3, Section 3-1.3 shall apply.

MOT Set-up and Removal: The MOT shall be established at the proper time and before any work is done, and shall be removed promptly at the end of work. Traffic lanes shall be opened as necessary in accordance with the provisions of the MOT.

Contractor's Vehicles: All Contractor vehicles shall have the company name clearly marked on the side.

Damaged Utilities: The permittee shall immediately notify the utility owner and repair any facility damaged while working in public right-of-way.

Work in School Area: No work is to be performed in a school area during posted school zone hours, and/or while children are present. The Traffic Engineering Division shall determine the school zone area.

Sidewalk Maintenance: All sidewalks shall be temporary patched and maintained until permanent restoration is accomplished.

Instructions from Broward County Inspectors: The permittee shall follow the instructions of Broward County Inspectors without argument.

Safety Vests: All personnel including the permittee, Engineer of Record, City, County or Testing Lab representative, visiting the site and present within the clear recovery zone shall wear an approved retro-reflective safety vest, which meets OSHA latest requirements.

OSHA Rules: All applicable OSHA rules shall be followed at all times.

Note: The above information is a list of certain important information that personnel working in public right-of-way need to be aware of, however it is not intended to be a complete list of all rules and regulations contained in the "Minimum Standards."

APPENDIX D

NAME, ADDRESS, SYMBOL AND WEBSITE FOR ORGANIZATIONS, ASSOCIATIONS, SOCIETIES AND GOVERNMENT AGENCIES

<p>American Association of State Highway and Transportation Officials 444 North Capital, Northwest, Ste. 249 Washington, D.C. 20001 www.aashto.org/aashto/home.nsf/FrontPage</p>	<p>(AASHTO)</p>	<p>American Welding Society 550 NW LeJeune Road Miami, Florida 33126 www.aws.org</p>	<p>(AWS)</p>
<p>American Concrete Institute Post Office Box 4754 38800 Country Club Rd. Farmington Hills, Michigan 48331 www.aci-int.org/general/home.asp</p>	<p>(ACI)</p>	<p>Broward County Environmental Protection Department 115 S. Andrews Avenue – Rm A-240 Ft. Lauderdale, FL 33301 www.broward.org/environment</p>	<p>(EPD)</p>
<p>American Gas Association 400 N. Capital Street, NW Washington D.C. 20001 www.aga.org</p>	<p>(AGA)</p>	<p>Department of Fire Rescue and Emergency Services 2601 W. Broward Blvd. Ft. Lauderdale, FL 33312 www.sheriff.org/about_bso/dfres</p>	<p>(DFRES)</p>
<p>American National Standards Institute 1819 L Street, NW Ste. 600 Washington DC, 20036 www.ansi.org</p>	<p>(ANSI)</p>	<p>Broward County Highway Construction and Engineering Division 1 N. University Dr., Suite 300 Plantation, FL 33324 http://bcegov2.broward.org/bcengineering/index.asp</p>	<p>(HCED)</p>
<p>American Society for Testing Materials 100 Barr Harbor Dr. P.O. Box C700 West Conshohocken, Pennsylvania, 19428 www.astm.org</p>	<p>(ASTM)</p>	<p>Broward County Mass Transit Division 3201 West Copans Road Pompano Beach, FL 33069 www.broward.org/bct/welcome.htm</p>	<p>(BCMTD)</p>
<p>American Society of Mechanical Engineers 22 Law Drive Fairfield, New Jersey 07007-2300 www.asme.org</p>	<p>(ASME)</p>	<p>Broward County Waste and Recycling Services 1 N. University Dr., Ste. 400 B Plantation, FL 33324 www.broward.org/waste</p>	<p>(BCWRC)</p>
<p>American Water Works Association 6666 W. Quincy Avenue Denver, Colorado 80235 www.awwa.org</p>	<p>(AWWA)</p>	<p>Broward County Traffic Engineering Division 2300 West Commercial Blvd. Ft. Lauderdale, Fl. 33309 www.broward.org/traffic</p>	<p>(BCTED)</p>

APPENDIX D

NAME, ADDRESS, SYMBOL AND WEBSITE FOR ORGANIZATIONS, ASSOCIATIONS, SOCIETIES AND GOVERNMENT AGENCIES

<p>Water and Wastewater Services (WWS) 2555 West Copans Road Pompano Beach, Fl. 33069 www.broward.org/waterservices</p>	<p>National Electrical Manufacturers Association (NEMA) 1300 N. 17th St., Ste. 1877 Rosslyn, Va. 22209 www.nema.org</p>
<p>Florida Department of Health (FDOH) 4052 Bald Cypress Way Tallahassee, FL 32399-1701 www.doh.state.fl.us</p>	<p>National Fire Protection Association (NFPA) 1 Batterymarch Park Quincy, Massachusetts 02169-7471 www.nfpa.org/catalog/home/index.asp</p>
<p>Florida Department of Environmental Protection (FDEP) 3900 Commonwealth Blvd, Tallahassee, FL 32399-3000 www.floridadep.org/admin/contacts.htm</p>	<p>Occupational Safety & Health Administration (OSHA) 200 Constitution Ave., Washington DC, 20220 www.osha.gov</p>
<p>Florida Department of Transportation District 4 (FDOT) 3400 W. Commercial Blvd. Ft. Lauderdale, FL 33309 www.dot.state.fl.us</p>	<p>South Florida Water Management District (SFWMD) 3301 Gun Club Road West Palm Beach, FL 33406 www.sfwmd.gov</p>
<p>Manufacturers Standardization Society of the Valves and Fittings Industry (MSS) 127 Park Street Vienna, Virginia 22180 www.mss-hq.com</p>	<p>U.S. Department of Transportation (USDOT) 400 7th Street, S.W., Washington D.C. 20590 www.dot.gov</p>

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