GENERAL REQUIREMENTS

Engineering plans.

All final engineering plans for public and private improvements, including but not limited to canal or lake excavation, dredging, bulkheads, bridges, culverts, headwalls, endwalls, earthwork (cut or fill), grading, paving (including subgrade preparation, base and surface), sidewalks, curbs and gutters, median crossings, guardrails, street signs, storm drainage, water, sewer, utilities, cable, shall be submitted to the city engineer for review and approval prior to any construction.

(a) Application for an engineering permit shall include the following:

1. Four (4) complete sets signed and sealed plans by a registered professional engineer in the State of Florida.

(a) Plans shall be submitted on 24" X 36" sheets except that for small projects, plans may be submitted on smaller sheets, provided all the required information fits on one (1) sheet.

(b) Plans shall clearly indicate how proposed work and existing conditions are being integrated to meet the requirements of all applicable codes.

(c) The plans shall bear the following statement by the engineer of record:"The proposed work has been designed in accordance with all applicable Federal, State, County and City of Tamarac Codes and regulations having jurisdiction. If any discrepancies exist between the plans/specifications prepared by the designer and the City of Tamarac Code and/or the City of Tamarac standard details, the later or most stringent shall govern."

2. Detailed certified cost estimate sealed by a registered professional engineer in the State of Florida on the approved City of Tamarac form, referred to as the cost estimate, copies of which form are available in the city engineer's office or www.tamarac.org.

3. All required development permits and staff reports from the South Florida Water Management District, State of Florida Department of Environmental Regulation, Florida Department of Transportation, Broward County Engineering Department, Broward County Environmental Protection Department, etc., that have jurisdiction.

4. Copies of the contractor's certificate of competency and insurance.

5. One (1) copy of the final plat with the plat report.

6. Prior to the issuance of any permit, other than for clearing and grubbing, submittal and approval of the public improvement bond is required. The bond shall be posted by the developer or his general contractor with the city in the amount of one hundred (100) percent of the itemized estimated cost, prepared and certified by an engineer registered in the state for all required public improvements. This bond shall be cash, irrevocable bank letter of credit, a cashier's check or other negotiable instrument, or a surety bond written by a company listed in the latest revision of circular 470 standard Surety Companies Acceptable on Federal Bonds. Also acceptable is a letter from a savings and loan or commercial bank stating that:

(a) It has committed funds in an amount equal to the cost of the project

(b) Moneys will be disbursed as work is done but only after inspection and approval by the design engineers and approval of the bank's engineers;

(c) The work will be completed in accordance with the approved engineering drawings and specifications as well as all applicable city ordinances;

(d) The bank or savings and loan guarantees completion if the developer does not complete;

(e) It is holding a separate collateral account in an amount equal to twenty-five (25) percent of the cost of the improvements, which moneys are to remain available one (1) year after formal approval and acceptance of subdivision improvement by the city, together with any needed corrections or insufficiencies in design, workmanship and/or materials which are found within one (1) year of the date of formal acceptance; and

(f) The moneys held will be released to the city upon demand if the city certifies that the work is not being done in accordance with specifications and drawings.

(g) All bonds shall be approved by the city attorney (as to form) and the city engineer (as to dollar amount). Either may require such terms and/or conditions as they deem necessary for the protection of the city. The bond shall guarantee the completion of all stipulated improvements in accordance with the approved engineering plans and within a specified time period, approved by the city engineer and the city commission.

Permits.

Following approval of the final site development plan by the city commission, posting of all required public improvement bonds, execution of water and sewer developer's agreement payment of required fees and obtaining permits from all agencies having jurisdiction for the proposed work, the owner of the land being developed, or his bona fide agent, is required to obtain permits from the city for all land improvements occurring on public or private property. No improvement or alteration of any existing public or private property or utility shall be allowed without a city permit issued for such specific improvement. The permit shall be visibly displayed at all times during construction. As a condition of the permit, a copy of the approved record drawings furnished by the city engineer shall be on the project site at all times.

(a) No person shall open any streets or median or alter or cut any curb adjacent to any street or thoroughfare without first obtaining a permit from the city authorizing such alteration or change of pavement or median cut.

Permits issued pursuant to this article shall be deemed in full force and effect until such time as the work covered thereby is complete. However, if work covered by a permit has not commenced within three (3) months from the date of issuance of the permit, or has been commenced and then suspended or abandoned for a period of sixty (60) days from the date of the most recent inspection, the permit automatically is terminated and shall become null and void unless special exception is granted by the city commission. Work shall be considered to have commenced and be in active progress when, in the opinion of the city engineer, a full complement of workers and equipment is present at the site to diligently incorporate materials and improvements into the project. When a permit has been terminated, all fees paid shall be forfeited and any work started after such termination shall be subject to all applicable city ordinances in effect at the time a subsequent permit is issued, and submittal of new cost estimates for all remaining incomplete improvements and fees paid for a new permit at the time of resumption of the work, and bond adjusted accordingly.

Roadways and Parking areas

1) The project designer shall provide a sufficient combination of lane width and edge of pavement radii to allow all passenger vehicle turning movements (into, out of and within the site) to occur without encroaching into other lanes.

2) A minimum backup distance of twenty (20) feet is required between property lines or interior drives and the first parking stall

3) Banks, savings and loans, and restaurants having drive-in window facilities are required to provide one-hundred-foot stacking lanes for each window, free of adjacent parking stalls and associated backup lanes

4) Each parking space required and provided shall be not less than ten (10) feet in width and eighteen (18) feet in length, with a two (2) feet overhang. This requirement is intended to be the minimum parking space size requirement and is not intended to require existing parking spaces to be decreased in size to meet this minimum requirement. All parking shall conform to this section and the City of Tamarac's standard details.

(a) All required parking stalls shall have direct and unobstructed access from a parking aisle

(b) All off-street parking areas shall be so arranged and marked as to provide for orderly, safe loading, unloading, parking and storage of vehicles, with individual parking stalls clearly defined with approved pavement markings or curbing and traffic signs provided as necessary for traffic control

(c) No driveway shall be constructed in the radius return of an intersection. No driveway shall be constructed closer than twenty-five (25) feet to the intersection of street right-of-way lines. No driveway entrance shall include any public facility such as traffic signal standards, catch basins, crosswalks, loading zones, utility poles, fire alarm supports, meter boxes, sewer cleanouts or other similar-type structures

5) Markings and curbing shall be as follows

(a) Parking lots shall be marked by painted lines or raised concrete curbs or other means to indicate individual spaces

(b) Posted signs and markers shall be used as necessary to ensure sufficient traffic operation of the lot

(c) All ingress and egress lanes shall be marked by appropriate painted lines, arrows and stop signs. The arrows shall be painted with plastic silicone reflective paint

(d) Each stall shall be marked by a painted four-inch-wide line on each side. The width of the stall shall be measured from centerline to centerline of the painted lines. Each stall shall be provided with wheel stops.

(e) All pavement markings located within the public right-of-way or City owned property shall be thermoplastic material, in accordance with FDOT Standard Specifications

Pavement requirements:

1. Vegetation, muck, large roots, stumps or other matter not suitable for inclusion in roadways, parking lots, and within the right-of-way limits of roadways and off-street parking areas shall be removed.

2. Subgrade fill material shall be clean material meeting FDOT Standard Specifications. All Subgrade material shall have a minimum LBR of 40. The top twelve (12) inches of the subgrade material shall meet or exceed 98% modified proctor density per AASHTO T-180 and compacted in maximum six (6) inch lifts. After the subgrade is complete, the Contractor shall obtain from an independent testing laboratory at his expense a minimum of one (1) density test per two thousand five hundred (2,500) square feet.

3. Base course shall consist of an eight (8) inch (compacted thickness) limerock layer. Limerock shall have a minimum percentage of Carbonates of Calcium and Magnesium of 70% and a minimum LBR of 100. The base shall meet or exceed 98% modified proctor density per AASHTO T-180. After the base is complete, the Contractor shall obtain from an independent testing laboratory at his expense a minimum of one (1) density test per two thousand five hundred (2,500) square feet of material.

4. A prime coat shall be used on the finished limerock base and a tack coat shall be used between paving courses. All paved areas shall receive a minimum asphaltic concrete surface course of one and one half (1 ½) inches, compacted thickness, two (2) 3/4" Lifts.

5. The final layer of asphaltic concrete directly adjacent to on going construction shall not be constructed until such construction is complete. The developer shall place three-fourths inch of asphalt cement surface course and after construction is completed, the final three-fourths inch layer will be constructed

6. All roadways shall have required sodding and landscaping prior to final acceptance by the city.

7. Roadways shall be striped in accordance with the latest Florida Department of Transportation Standards for Pavement Markings, the Manual on Uniform Traffic Control Devices, Broward County Traffic Engineering and the City of Tamarac engineering standard details which can be obtained from the City Engineer's office.

8. The placement and maintenance of shrubbery, aboveground sprinkler systems, mailboxes, signs, tree trimmings, refuse, concrete blocks, coral rock, pyramid-shaped cement curbstones, or any other sharp-edged or pointed organic or nonorganic or poisonous material which could cause a road or traffic hazard, or injury to pedestrians, on the swale area adjacent to the public right-of-way within the ten-foot area measured from the edge of the paved surface of the vehicular right-of-way is prohibited.

Sight distance

If a driveway intersects a public right-of-way, there shall be no sight obstruction within a triangular area of property on both sides of a driveway formed by the intersection of each side of the driveway and the public right-of-way line, with two (2) sides of each triangle being ten (10) feet in length from the point of intersection and the third side being a line connecting the ends of the two (2) other sides

(a) If a crosswalk intersects a vehicular access aisle, driveway or a public right-of-way, there shall be no sight obstruction within a triangular area of property on both sides of a crosswalk or walkway formed by the intersection of each side of the walkway and the public right-of-way or aisle, with two (2) sides of each triangle being ten (10) feet in length from the point of intersection and the third side being a line connecting the ends of the two (2) sides

(b) Within the triangular areas described above, it shall not be permissible to install, set out or maintain, or to allow the installation, setting out or maintenance of, either temporarily or permanently, any vehicular parking space, sign, wall, hedge, shrubbery, tree, earth mound, natural growth or other obstruction of any kind which obstructs cross-visibility at a level between thirty (30) inches and eight (8) feet above the level of the center of the adjacent intersection. Any wall or fence within the sight triangle must be constructed in such a manner as to provide adequate cross-visibility over or through the structure between thirty (30) inches and eight (8) feet in height above the driving surface

(c) The following will be permitted within that portion of the triangular area described above that is not in the public right-of-way:

1) Trees having limbs and foliage trimmed in such a manner that no limbs or foliage extend into the area between thirty (30) inches and eight (8) feet above the level of the center of the adjacent intersection. Trees must be so located so as not to create a traffic hazard.

2) Trees having a trunk diameter less than or equal to (4) four inches.

3) Landscaping, except required grass or ground cover, shall not be located closer than five (5) feet from the edge of any roadway pavement, and three (3) feet from the edge of any alley or driveway pavement

4) Fire hydrants, public utility poles, street markers and traffic-control devices.

Sidewalks.

Sidewalks shall be constructed in accordance with the City of Tamarac's standard detail sheets and this section.

a) Sidewalks shall be required in all new construction. All buildings shall be connect by a continuous path and provide accessible routes throughout the development to the public transportation system. Sidewalks shall also be required in all rights of way adjacent to the private and public property to create a continuous network throughout the City.

b) Sidewalks shall be a minimum of five (5) feet in width and four (4) inches thick for residential developments and (6) inches thick for commercial developments and sidewalks that cross over driveways. Sidewalks shall be constructed to a true line and grade from transit mix concrete having a minimum twenty-eight-day compressive strength of three thousand (3,000) psi. Metal or approved wood forms shall be used for all concrete work and all surfaces exposed when forms are removed shall be rubbed while the concrete is green to produce a finished surface smooth and even, free of form marks, voids and honey- comb. Any irregularities greater than one-fourth inch, as determined by placing a ten-foot straightedge parallel with, on a four-foot straightedge perpendicular to the long axis of the sidewalk, shall be cause for rejection of that section of sidewalk between joints. Sidewalk wearing surfaces shall have broom finish. Sidewalk shall meet ADA requirements.

c) Subgrade material under sidewalks shall be clean material free of vegetation, muck, large roots or other deleterious material. The top six (6) inches of the soil shall be compacted to 98% per AASHTO T-180.

Concrete curbs and gutters.

Curbs and gutters shall be constructed in accordance with the City of Tamarac's standard detail sheets and this section.

Concrete curbs and gutters shall be constructed to a true line and grade from transit mix concrete having a minimum twenty-eight-day compressive strength of three thousand (3,000) psi. Metal or approved wood forms shall be used for all concrete work, and all exposed surfaces shall be rubbed while the concrete is green to produce a finished surface smooth and even, free of form marks, voids and honey- comb. Any irregularities greater than one-fourth inch, as determined by placing a ten-foot straightedge parallel with the long axis of the curb, shall be cause for rejection of that section of curb.

(a) Subgrade fill material under curbs shall be clean material free of vegetation, muck, large roots or other deleterious material as classified by FDOT Standard Specifications. All material supporting curbs shall have a minimum LBR of 40. The top twelve (12) inches of the soil shall meet or exceed 98% modified proctor density per AASHTO T-180 and compacted in maximum six (6) inch lifts.

(b) Extruded curbs shall be poured monolithically

(c) Control joints shall be tooled or cut every ten (10) feet.

(d) All areas behind curbs shall be backfilled within seventy two (72) hours of placement.

Guardrails.

Guardrails shall be constructed within the right-of-way wherever a canal, lake or ditch lies
Within twenty-five (25) feet of the pavement or the city engineer determines that guardrails are necessary for the protection of the public.

(a) Guardrails shall be installed in accordance with the City of Tamarac's standard details and the F.D.O.T. "Roadway and Traffic Design Standards"

(b) Reflectorized guardrails shall be installed at the end of pavement on all streets or drives which are temporarily dead ended or a "T" turnaround is installed. Proper "Dead End" signs shall be placed at the closest intersection to the dead end.

(c) A continuous strip of asphalt two (2) inches thick and three (3) feet minimum width, centered on the guardrail shall be placed at all installations in unpaved areas.

Elevations and benchmarks.

A minimum of two (2) bench marks shall be established by a registered land surveyor on or adjacent to any project for which elevations are shown on the submitted drawings, which shall clearly show the following:

1. The datum being used.

2. The location, description and elevation of the bench marks on or adjacent to the project, to be used for vertical control.

(a) Bench marks shall be placed on permanent reference monuments or equally stable objects that are easily recognized, easily found and not likely to move.

(b) Bench marks as described above shall be equivalent to third-order and be established in conformance with the Standards of Practice promulgated by The Florida Society of Professional Land Surveyors.

Engineer final certification

After all required improvements have been installed, the owner shall have the Engineer of record submit certification to the City that the improvements have been constructed according to the City of Tamarac Code and standard details, ADA requirements, approved plans/specifications and all other requirements set forth by agencies having jurisdiction, based on inspections of the site and review of as-built drawings.

As-built record drawings.

The developer shall engage the services of a professional engineer or land surveyor in the State of Florida to prepare record drawings of the improvements. Mylar sepias of the as-built project for the site plan and engineering drawings, signed, sealed and dated by the responsible professional. In addition, plans are to be submitted in a digital format in AutoCAD latest version. Digital File to be compatible with the City's GIS system. Record Drawings submitted to the City as part of the project acceptance shall comply with the following requirements:

a) Storm drainage. Record drawings shall include:

1) Length of pipe runs from center of structure to center of next structure, including the size and type of pipe used;

2) Type and size of each structure and its location with reference to property lines and/or the street centerline;

3) Top of rim elevations, grate elevations, manhole elevations and invert elevations of all pipes;

4) Inverts of swales shown at fifty-foot intervals coinciding with pavement interval elevations;

5) Cross-section drawings of the lakes and canals within and adjacent to the development at two-hundred-foot intervals;

The above-noted record drawings shall be submitted to the city engineer, and his approval thereof must be obtained prior to placement of limerock base course adjacent thereto. If the city engineer finds any or all of the work to be unacceptable, it shall be the responsibility of the developer to correct the unacceptable work and provide new record drawings for that portion of the work as provided above. In any event, approval of the drainage must be obtained from the city engineer prior to the placement of any limerock base course.

b) Pavement. Record drawings shall include:

1) Finish grades at the edge of finished rock and centerline at longitudinal intervals of not more than fifty (50) feet, street intersections and/or all changes in gradient:

2) Top of rim elevations of all sanitary sewer manholes within areas to be paved.

3) Top and/or Lip of curb elevations and curb flow line elevations if applicable.

The above-noted record drawings shall be provided to the city engineer and his approval must be obtained prior to the placement of the asphaltic surface course. If the city engineer finds any or all of the work to be unacceptable, then it shall be the responsibility of the developer to correct the unacceptable work and provide new record drawings for that portion of the work as provided above. In any event, approval of the base course must be obtained from the city engineer prior to placement of any asphaltic surface course.

Easements

Recorded easements shall be provided for the installation of all underground utilities facilities, in conformance with such size and location of easements as may be determined by the city engineer to be compatible with the requirements of all utility companies involved with respect to a particular utility service.

a) Easements across lots or centered on rear or side lot lines shall be provided for public utilities where necessary and shall be at least twelve (12) feet in total width

b) Where a subdivision is traversed by a watercourse, drainage way, canal or stream, there shall be provided a drainage easement or right-of-way, conforming substantially with the lines of such watercourses. Parallel streets or maintenance easements may be required where necessary for service or maintenance

c) Easements may be required for drainage purposes, of such size and location as may be determined by the city engineer or by a drainage district if the plat lies within its jurisdiction. Such shall be required if necessary to tie into the city drainage system or any drainage district plan by the city engineer or the drainage district engineer

d) All canal maintenance easements shall be a minimum of twenty (20) feet. No above ground construction or usage of this maintenance easement will be allowed.

Restoration

Pavement restorations shall conform with requirements of all applicable agencies having jurisdiction and the City of Tamarac's Code and standard details.

(a) Relocation of foliage. All natural foliage removed as a result of street cuts, median cuts, sidewalks or thoroughfare cuts shall be replaced or relocated at the expense of the applicant.

(b) Laboratory and field tests which are necessary in the opinion of the city engineer to establish compliance with the compaction requirements of this section shall be conducted at the applicant's expense.

(c) Temporary restoration shall be provided within the same day for the cutting of the pavement, street, curb or median. Such temporary restoration shall be constructed in a manner to provide a safety for the general public.

(d) During the course of cutting and restoring any thoroughfare or street which consists of more than one (1) lane in either direction, not more than one (1) lane in either direction may be rendered impassable by traffic at any given time. Where practical, steel plates shall be used to facilitate through traffic during the period of construction.

(e) Wherever pavement is damaged by the installation of new work or installation equipment, it shall be repaired to the full width of the lane.

Retention Requirements

(a) Water Quality and Pretreatment

a. Water Quality and Pretreatment storage shall be designed in accordance with the South Florida Water Management District's (SFWMD) Permit Information Manual "Management and Storage of Surface Waters", latest edition.
b. Water quality storage shall be provided for all development and shall be no less than one (1) inch of rainfall over the entire site.
c. In addition to water quality storage, pretreatment storage shall be provided for all commercial and industrial development and shall be no less than one-half (1/2) inch of the rainfall over the entire site.
d. Only the following storage volumes shall be credited towards water quality and pretreatment:
i. For the C-14 basin:
1. Volumes stored in dry retention areas between elevations of 7.5 MSL and 10.0 MSL.
2. Volumes stored in wet detention areas between elevations of 7.0 MSL and 10.0 MSL.
ii. For the C-13 basin:
1. Volumes stored in dry retention areas between elevations of 6.5 MSL and 9.0 MSL.
2. Volumes stored in wet detention areas between elevations of 6.0 MSL and 9.0 MSL.
iii. For either C-14 or C-13 basins, volumes stored in exfiltration trenches, calculated using the equations found in the South Florida Water Management District's Permit Information Manual "Management and Storage of Surface Waters", latest edition.
e. The bottom of all dry retention areas shall be no lower than elevation 7.5 MSL within the C-14 basin and elevation 6.5 MSL within the C-13 basin.
f. All water quality and pretreatment storage must be provided on site.

(b) Additional Retention

a. The rains of April of 1979 and October of 1999 underscored the need for additional water storage areas within the City. The following minimum standards for additional retention within the C-14 drainage basin have been developed. It is imperative that all new development be subject to the minimum standards set for herein.
b. The additional retention requirement applies only to the (C-14 basin) portion of the City of Tamarac lying west of NW 64th Avenue, less the area of land section 7, township 49 south, range 41 east.
c. In addition to any other regulatory agency's storage requirements, new site plans shall be designed to provide nine thousand one hundred twenty five (9,125) cubic feet of additional stormwater retention per acre of development.
d. Only the following storage volumes shall be credited towards additional retention:
i. Volumes stored in dry retention areas between elevations of 7.5 MSL and 10.0 MSL.
ii. Volumes stored in wet detention areas between elevations of 7.0 MSL and 10.0 MSL.
iii. Volumes stored in exfiltration trenches, calculated using the equations found in the South Florida Water Management District's Permit Information Manual "Management and Storage of Surface Waters", latest edition.
e. The bottom of all dry retention areas used for the purpose of additional retention storage shall be no lower than elevation 7.5 MSL.
f. All additional retention storage must be provided on site.

(c) Exfiltration Systems

a. Exfiltration systems may be used to supplement retention areas for the purpose of water quality, pretreatment, and additional retention storage.
b. Exfiltration trenches shall be designed in accordance with the South Florida Water Management District's (SFWMD) Permit Information Manual "Management and Storage of Surface Waters", latest edition.
c. Final calculations for dimensioning exfiltration trenches shall be based on actual soil permeability tests performed on site.
d. Exfiltration systems shall not be used in public right-of-ways or for any public facility.
e. Maintenance access shall be provided on both sides of exfiltration trenches in the form of approved manholes or catch basins. The maximum distance between such access structures shall not exceed three hundred (300) feet.
f. Geotextile materials used in the construction of exfiltration trenches shall be in accordance with the criteria of FDOT "Roadway and Traffic Design Standards", latest edition, Index no. 199.

Flood Protection

(a) Method of Discharge

a. Connection to Public System
i. All development shall drain via positive outlets to a public system of adequate capacity. Such system may consist of an existing pipe of adequate capacity to accept the additional discharge generated from the project, a public canal or lake. If a connection to an existing system is proposed, calculations shall be submitted to prove that it can accept the proposed discharge in addition to existing areas.
ii. The connection to a public drainage system shall be at no cost to the City.
b. Stand-Alone System
i. Land locked developments that do not have an adequate discharge point will have the option to build a system connected to an existing lake or canal, or to design a stand alone drainage system by detaining the runoff volume from the 100-Year/3-Day storm event on site with no impact to adjacent roadways or developments.
ii. Calculations shall be submitted to show that the proposed development will retain water on site up to the 100-Year/3-Day storm elevation with no impact to adjacent roadways or developments. Such calculations shall also show that the detained water will be drawn down to the design water elevation within 10 days.

(b) Design Storm Stage Elevations

a. Drainage calculations shall show that the 10-Year/1-Day storm stage elevation is equal to, or lower than the lowest catch basin rim elevation within the roadway or parking area.
b. Drainage calculations shall show that the 25-Year/3-Day storm stage elevation is equal to, or lower than the site perimeter elevation.
c. Drainage calculations shall show that the minimum finished floor elevation is at or above the 100-Year/3-Day storm stage elevation.

Design Parameters

(a) Drainage Pipes and Culverts
a. Materials
1. All drainage pipe installed within public rights of way shall be reinforced concrete.
2. Acceptable pipe materials for use on private property are: reinforced concrete (RCP) and high density polyethylene (HDPE).
b. Roughness Coefficients. Manning's "n" values used in all drainage calculations submitted to the City for review shall be as follows:
1. Reinforced concrete: 0.013
2. Corrugated aluminum pipe: 0.024
3. High Density Polyethylene: 0.011
4. Cast Iron: 0.013
c. Minimum Cover. Minimum cover for all drainage pipes shall be designed in accordance with FDOT "Roadway and Traffic Design Standards", latest edition, Index no. 205, but shall never be less than Thirty (30) inches.
d. Pipe and Culvert Ends shall have concrete headwalls to protect from undermining and provide a readily maintainable entrance/exit for stormwater flow. Concrete headwalls designed in accordance with FDOT roadway and traffic design standards, latest edition, Index no. 250 through 255 end sections.
e. Rip-rap is not an acceptable means of end protection or soil stabilization.

(b) Drainage Structures
a. Materials. All drainage structures, including inlets, manholes and end walls shall be pre-cast reinforced concrete.
b. Minimum thickness of walls, base and slabs shall be eight (8) inches.
c. Maintenance Access. The maximum pipe lengths between access points consisting of an approved manhole or inlet, shall be designed in accordance with the FDOT drainage manual, latest edition, but shall not exceed the distances shown below:
1. for 15" through 18" pipe: 300 feet
2. for 24" through 36" pipe: 400 feet
3. for pipes larger than 36": 500 feet
d. Minimum Sump. A minimum sump of twenty-four (24) inches shall be provided below the invert of the lowest pipe in all inlet and manhole structures to prevent sediment from reaching the discharge point.
e. Aprons. All structures having a lid or grate located in a grassy area shall have a two (2) foot concrete apron all around to prevent the grass from covering the top.
f. Sediment Control. All inlets shall be protected from sediment laden storm runoff until completion of all construction operations that may contribute sediment to the inlet.

(c) Coefficients of Runoff used in all drainage calculations provided to the City for review shall be as follows:
a. For grassed or other pervious areas: 0.50
b. For paved or other impervious areas: 0.95

(d) Design Water Elevations
a. For the C-14 drainage basin shall be 7.0 MSL
b. For the C-13 drainage basin shall be 6.0 MSL

(e) Time of Concentration
a. The minimum time of concentration shall be ten (10) minutes.
b. The maximum time of concentration shall be thirty (30) minutes.

(f) Retention Areas
a. The maximum slope for the banks of dry retention areas shall not exceed three (3) to one (1) horizontal to vertical, except for any areas within five (5) feet from a sidewalk in which the slope shall not exceed four (4) to one (1) horizontal to vertical.
b. The minimum width of the bottom of dry retention areas shall not be less than three (3) feet.
c. The banks and bottom of retention areas shall be covered with sod.
All drainage retention areas shall be connected to the on-site drainage system with a drainage inlet/outlet.

Canals and Lakes

Canals dedicated to the public shall have a minimum right-of-way width of eighty (80) feet as measured at the design water elevation. Lakes dedicated to the public shall have a minimum surface water width of one hundred fifty (150) feet. A maintenance easement twenty (20) feet in width shall be provided adjacent to the entire boundary of a lake or canal.

The elevation of the bottom at the center of the canal or lake shall bee a minimum of twelve (12) feet below the design water elevation. The side slopes of the canal or lake shall be designed in accordance with the City of Tamarac Code and Standard details.

All canals and lakes shall connect directly or indirectly to the secondary canal system permitted by the South Florida Water Management District.

REVISIONS				REVISIONS			
No.	Date	Remarks	By	No.	Date	Remarks	By
					4/07	Revised Design Parameters Notes	HA
					2/08	Revised Design Parameters Notes	J.E.D

Design By:
Drawn By:
Checked By:
Approved By: Date: 00/00/08

Date:
Date:
Date:

CITY OF TAMARAC
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

TAMARAC The City For Your Life

Seal:

JOHN DOHERTY, P.E.

STANDARD DETAILS
GENERAL NOTES
CITY OF TAMARAC, BROWARD COUNTY, FLORIDA

Job No.
Scale: N.T.S.
SHEET 1 OF 1