



ENGINEERING PERMIT CONSTRUCTION REQUIREMENTS

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| SECTION 1 | PRE-CONSTRUCTION CHECKLIST |
| SECTION 2 | ENGINEERING AND CONSTRUCTION CERTIFICATION SUBMITTALS |
| SECTION 3 | REQUIRED ENGINEERING INSPECTIONS |
| SECTION 4 | RECORD DRAWING REQUIREMENTS |
| SECTION 5 | ENGINEERING FINAL INSPECTIONS |
| SECTION 6 | C.O. SIGN OFF AND BOND RELEASE PROCEDURES |

Department of Environmental and Engineering Services (DEES)

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CONSTRUCTION CHECKLIST

1. Paving:

- a. Subgrade density test and string line.
- b. Base (rock) density test and straight edge.
- c. Base (rock) as-builts.
- d. Prime base (do not prime before City approval of rock as-builts),
- e. First lift of asphalt
- f. Second lift of asphalt
- g. Pavement markings.
- h. Signage.

2. Drainage:

- a. Lake and/or canal excavation.
- b. Drainage structures damage.
- c. Drainage pipes damage,
- d. Laying pipe.
- e. Placing drainage structures,
- f. Exfiltration trench.
- g. Headwalls.
- h. Pollution retardant structures,
- i. Outfall structures.
- j. Lamping.
- k .Swales.
- l. Finished grade.
- m.Drainage as-builts.
- n. Irrigation permit from SFWMD if non-residential irrigation.

3. Water:

- a. Pipe Damage.
- b. Connection to existing system.
- c. Pipe laying.
- d. All conflicts (to be left exposed).
- e. Thrust restraints.
- f. Pressure test (after base rock inspection).
- g. Bacteriological samples (two (2) consecutive days with City representative present).
- h. Water as-builts

4. Gravity Sewer:

- a. Pipe damage.
- b. Manhole damage.
- c. Manhole painting (one (1) coat on exterior).
- d. Connection to existing system (pipe connection or manhole coring).
- e. Pipe laying.
- f. Placing manholes.
- g. Manhole flow channels and grouting.
- h. Manhole painting (two (2) coats on interior).
- i. Lamping.
- j. Video taping.
- k. Sewer as-builts.

5. Lift Station:

- a. Excavation.
- b. Wet well damage.
- c. Wet well painting (one(1) coat on the exterior).
- d. Wet well painting (two (2) coats on the inside).
- e. Wet well placement.
- f. Connection to new force main.
- g. Start up and operation (pumps, control box, alarms, etc.).
- h. Fence, driveway, and landscaping.
- i. Lift station as-builts.

6. Force Main:

- a. Pipe damage.
- b. Connection to existing system.
- c. Pipe laying.
- d. All conflicts (to be left exposed until City approval).
- e. Thrust restraints.
- f. Pressure test
- g. Force main as-builts.

7. Structural:

- a. Formwork and steel.
- b. Concrete placement.
- c. Backfill/berm.

8. Landscaping

- a. Conflicts with utilities and paving.

SECTION 1: PRE-CONSTRUCTION CHECKLIST

This document is intended to provide minimum City construction criteria. Additional criteria may be required. Please consult the City of Margate Code of Ordinances (<http://www.municode.com/Library/FL/Margate>).

Approval from other governmental agencies may be needed prior to City approval for construction. It is the Engineer of Record and the Contractor's responsibility to determine which approvals are needed and to supply the City with copies of the approval notices.

- 1. The Contractor shall obtain all necessary plan approvals and permits prior to start of construction.
- 2. The Contractor shall notify the Department of Environmental and Engineering Services (DEES) at least 48 hours prior to the start of any construction.
- 3. The Contractor shall schedule inspections and tests with the City at least 48 hours prior to any inspections by calling DEES at 954-972-0828.
- 4. The Contractor shall coordinate all inspections, certifications, and approvals with the appropriate governing agency.
- 5. The Engineer of Record shall provide the City with a written daily report of all construction related activity (public works projects only).
- 6. The Engineer of Record shall be present at all scheduled inspections and tests and shall provide DEES with a written report of the results.
- 7. The Contractor shall supply shop drawings to DEES for approval prior to the start of construction. No materials are to be installed prior to DEES approval.
- 8. The Contractor shall provide any necessary stake-out of proposed improvements and elevations.
- 9. The Contractor shall provide DEES with record drawings.
- 10. The Contractor shall obtain density tests as directed by the City.

- 11. The Contractor shall pre-test all newly installed utilities prior to contacting DEES to schedule official inspections or tests.
- 12. All valves shall have restraint joints and fittings must be inspected by the City.
- 13. Any and all deviations from the approved plans must have prior approval by the Engineer of Record and the City.
- 14. The Contractor shall protect or replace all existing improvements damaged or disturbed during construction whether or not shown on plans to the satisfaction of the City.
- 15. The Contractor and subcontractors shall contact SUNSHINE for all underground locations (1-800-432-4770) at least 48 hours prior to construction.
- 16. The Contractor shall notify all subcontractors that all on-site and new off-site locations shall be made through the Contractor and not the City. The City will not assume any utility location responsibility prior to release of the performance bond.
- 17. The Contractor and the Engineer of Record must review and approve all product submittals and shop drawings. (Approvals required on each sheet).
- 18. A wastewater lift station generator shall be supplied by the Developer prior to the acceptance of a new lift station that will be deeded to the City.

SECTION 2: ENGINEERING AND CONSTRUCTION CERTIFICATION SUBMITTALS

This document is intended to set minimum City criteria on project submittals. Additional submittals may be required as determined by the City of Margate depending on the project scope.

A. Water Distribution System

- 1. All Equivalent Residential Connection (ERC) water impact fees must be paid in full at or before the issuance of the first building permit.
- 2. Prior to construction, approval to use the general permit for construction of water main extensions, and after construction, certification of clearance from the Broward County Health Department.
- 3. Acceptable hydrostatic pressure test results provided by the Engineer of Record.
- 4. Approved bacteriological test results. Water sampling must be witnessed by the City.
- 5. Field density test reports certified by a professional engineer registered in the State of Florida on backfill in trenches and around manholes, complete with test locations and elevations.
- 6. Water meter fee and deposit charges are to be paid in full before the installation of each water meter.
- 7. Record drawings.
- 8. Certification letter by the Engineer of Record indicating that the water distribution system has been installed in accordance with applicable regulations and the approved plans.
- 9. The Engineer of Record's certification of actual construction cost of the water distribution system improvements.

B. Sewer Collection and Transmission System

- 1. All Equivalent Residential Connection (ERC) sewer impact fees must be paid in full at or before the issuance of the first building permit.
- 2. Appropriate county and/or state approval for sewer collection and transmission construction.

- 3. Certified final sewer lamping report and video from the Engineer of Record.
- 4. Acceptable hydrostatic pressure test results on force mains certified by the Engineer of Record.
- 5. Field density test reports certified by a professional engineer registered in the State of Florida on backfill in trenches and around manholes, complete with test locations and elevations.
- 6. Record drawings.
- 7. Lift station operation report, spare parts, and all maintenance manuals.
- 8. Certification letter by the Engineer of Record indicating that the sewer collection and transmission system has been installed in accordance with the applicable regulations and the approved plans.
- 9. The Engineer of Record's certified actual construction cost of the sewer collection and transmission system.

C. Paving, Grading, and Drainage System

- 1. Field density test reports certified by a professional engineer registered in the State of Florida on all subgrade, base rock course, and backfill for pipe trenches, manholes, and other substructures, complete with test locations and elevations.
- 2. Base rock, concrete, and asphaltic concrete analysis reports (gradation, mix design, etc).
- 3. Rock as-builts prior to paving.
- 4. Record drawings.
- 5. Inspection report on the drainage system certified by the Engineer of Record.
- 6. Certification letter by the Engineer of Record indicating that all of the paving, grading, and drainage systems have been constructed in accordance with applicable regulations and the approved plans.
- 7. The Engineer of Record's certified actual construction cost of all paving, grading, and drainage construction.

D. Miscellaneous

- 1. All easements (water, sewer, drainage, lift station, access, etc).
- 2. Bill of sale for all facilities the City will be responsible for maintaining after project acceptance.
- 3. Release of liens from Contractor and all subcontractors.

SECTION 3: REQUIRED ENGINEERING INSPECTIONS

This document is intended to help Contractors prepare for City inspections by providing a list of the minimum items the City will inspect. Consult the Department of Environmental and Engineering Services (DEES) for further information. It is the Contractor's responsibility to provide personnel to perform the manual aspects of every inspection (opening manhole lids, turning gate valves, operating fire hydrants, string line, boarding, etc). Call DEES at 954-972-0828 a minimum of 48 hours in advance to schedule an inspection.

EROSION AND SEDIMENT CONTROL

- 1. Mandatory FIRST inspection. The erosion and sediment control plan, discharge locations, hay bales, silt fence, swales, material storage areas, structural control devices, and other erosion control measures will be inspected for compliance.

WATER

- 1. Water tie-in.
- 2. Water main pigging.
- 3. Water main flushing.
- 4. Water hydrostatic pressure test.
- 5. Bacteriological samples.
- 6. Hydrant flow testing.

SEWER

- 1. Sewer structures.
- 2. One coat paint (external).
- 3. Gravity sewer tie-in.
- 4. Gravity sewer lamping.
- 5. Gravity sewer infiltration/exfiltration testing or air testing.
- 6. TV inspections.
- 7. First coat red paint (internal).
- 8. Second coat black paint (internal).
- 9. Force main tie-in.
- 10. Force main flushing.
- 11. Force main hydrostatic pressure test.
- 12. Wet well tremie seal.
- 13. Wet well finished floor.
- 14. Lift station start up.

DRAINAGE

- 1. Drainage structures (rough).
- 2. Drainage tie-in.
- 3. Drainage pipe lapping.

PAVEMENT

- 1. Sub grade (string line, boarding, densities).
- 2. Curb pads.
- 3. Finished rock (string line, boarding, densities). *Rock as-builts require approval prior to paving.*
- 4. Seal coating.
- 5. Sidewalks in right-of-way.

LANDSCAPING

- 1. Florida No. 1 quality.
- 2. Number/Canopy area of trees (caliper, height, planting holes, mulch).
- 3. Number of shrubs (height, spread, mulch).
- 4. Adherence to approved landscape plans.

MISCELLANEOUS

- 1. Erosion and sediment control.
- 2. Clearing and grubbing.
- 3. Earthwork.
- 4. Final engineering (water, sewer, drainage, pavement).
- 5. Performance bond release.
- 6. Maintenance bond release.

NOTE: All final engineering inspections must be approved prior to the engineering certificate of occupancy final inspection.

SECTION 4: RECORD DRAWING REQUIREMENTS

I. General Requirements

- a. All record, or as-built, drawings shall be prepared on twenty-four-inch by thirty-six-inch size sheets unless otherwise approved by the City. The minimum allowable scale shall be one (1) inch equals fifty (50) feet.
- b. The developer shall engage the engineer of record to prepare record drawings, as described in these requirements, which shall clearly indicate any deviations from the approved engineering drawings for all public and private improvements. Preliminary record drawing submittals shall consist of two (2) sets of prints submitted prior to placement of any and all surface course pavement. The final submittal, which shall include paving record drawings, shall consist of two (2) paper sets, one (1) electronic set in PDF format, and one (1) electronic set in AutoCad 2007 or later format. Sets shall include sheets for cover page with index, all water, sewer, paving, drainage layouts and details plus geometric controls, photometric plans, and topographic plans. The digital format shall be georeferenced and use the following coordinating system: NAD83 Florida State Plane/East Zone/US Foot (zone 0901). All printed record drawing submittals shall be signed and sealed by the engineer of record.
- c. Preliminary record drawings of all underground installations, consisting of two (2) sets, shall be provided to the City and approval must be obtained prior to any and all limerock base course construction. If preliminary record drawings are approved by the City, then limerock base course construction may commence, after notification of such approval. If the City finds any or all of the work not constructed in accordance with City ordinances or the approved plan, then it shall be the responsibility of the developer to correct such work and provide new record drawings.
- d. The public improvement bond shall not be released until the City has approved the final record drawings for the improvements. In addition, release of the bond shall be contingent upon receipt by the City of a certificate in which the engineer of record certifies that the completed improvements are in compliance with the applicable city ordinances; will function as designed; and are installed in accordance with manufacturers recommendations and approved plans. Such certificate shall also state that the engineer of record has witnessed all tests, i.e., pressure testing and bacteriological sampling for water distribution, infiltration, exfiltration, lamping and/or television inspection, equipment start-up operations for wastewater collection and density tests for backfills, subgrade and limerock, etc.; that such testing has been conducted in accordance with the appropriate standard and, that the system in question has passed such testing.
- e. In phased projects the limit of the as-built information supplied must be clearly shown.
- f. Upon completion of construction and prior to final inspection or commencement of any bonded maintenance period, the engineer of record shall furnish final record drawings to the City. As-built information must be shown on the design drawings which were submitted for final engineering approval. The record drawing submitted shall also

include approved detail drawings. All drawing sheets must clearly be marked “**AS-BUILT**” or “**RECORD DRAWINGS**.”

g. Information must be clearly shown and shall include any deviations from the approved drawings including but not limited to line lengths, materials, invert and rim elevations, grades, additional structures, conflicts, cross sections, sizes, slopes, deleted structures, revised locations and the additional information necessary to clearly depict the actual construction.

h. Information must clearly show that the facilities to be dedicated to the City for maintenance have been constructed within dedicated rights-of-way or easements as shown on the plan. If the facilities have been constructed outside of a dedicated right-of-way or easement, legal descriptions and sketches of additional easements must be submitted in recordable form for approval by the city attorney.

II. Paving

a. Record drawings of the finished rock base must be submitted to the City for approval before proceeding with pavement work. These drawings must 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 breaks not to exceed three hundred (300) feet measured along the profile grade line.

b. Final record drawings submitted to the City for approval. The record drawings shall include:

1. Plan view of all paved areas and right-of-way or easement limits.
2. Spot elevations for the edges and centerlines of pavement for streets and parking lots at fifty-foot intervals and/or changes in grade.
3. Spot elevations for curbs and gutters at fifty foot intervals and/or changes in grade.

III. Stormwater System

Record drawings shall include:

1. *Surface drainage:*
 - a. Sufficient grades or contours to show drainage away from buildings and to a canal or other positive drainage system.
 - b. The centerline of swales showing flow arrows and percent of slope.
 - c. Sufficient grades and contours to show drainage from all paved areas including streets and parking lots. Drawings shall also include flow arrows and percent of slope.
2. *Collection facilities:*
 - a. Length of stormwater collection pipe shall run from center of structure to center of structure and shall include the size, material, and slope of pipe.
 - b. Type and size of each structure and its location (shown by

- c. station and offset or State Plane coordinates).
 - c. Rim elevations and invert elevations of all pipes or conduits within each structure.
 - d. Outfall structures detailed to show that proper connections, which will allow the drainage system to operate properly, have been made and that the proper endwalls have been provided.
- 3. *Retention facilities; canals and lakes:*
 - a. Canal design sections and as-built cross sections at a maximum of 100 (one-hundred) foot intervals, showing canal right-of way, edge of bank, water surface elevation, edge of water and adjacent property lines.
 - b. Details of all culverts to be shown on canal excavation as-builts including rights-of-way, riprap endwalls and invert elevations, as they relate to the canal excavation.
 - c. Storm drainage system connections to canals or lakes, demonstrating that proper connections to the canal or lake systems have been made.

IV. Sanitary Sewer System

The engineer of record shall provide documentation from Broward County that the wastewater system facilities have been approved for operation. Record drawings shall include:

1. Length of pipe runs from center of structure to center of structure including the size, material, and slope of pipe.
2. The type and size of each structure and its location (shown by station and offset or State Plane coordinates).
3. The rim elevations and invert elevation of all pipes within each structure.
4. The size and material of lateral connections.
5. That the location of all lateral connections at the main line and sanitary tees or cleanouts at the terminus of such laterals are accurate either by station and offset measurements or by swing ties to fixed points.
6. A profile drawing of all gravity flow systems showing grade, wastewater pipe, and manholes as constructed.
7. Complete and detailed information on wastewater pumping stations including type and size of each structure and its location with reference to property lines detailed drawings of mechanical, electrical, structural, instrumentation and control systems and design data used to size wet wells and pumps. Along with the record drawing submittal the developer shall submit three (3) copies of operation and maintenance (O&M) manuals for all major equipment, two (2) sets of final shop drawings for all major equipment and certification from the manufacturer that the equipment has been installed properly and has passed start-up testing.
8. Length of wastewater pressure mains including size, material, locations, and depth of cover.

V. Water Transmission and Distribution System

The engineer of record shall also provide documentation from Broward County that the water system facilities have been approved for operation. Record Drawings shall include:

1. The length of pipe including size, material, and depth of cover of water main pipe.
2. The size and material of water services.
3. The type and size of each valve and fire hydrant.
4. All lateral connections at the main line, fire hydrants, water meters, valves, and fittings must be accurately located either by station and offset measurements, State Plane coordinates, or by swing ties to fixed points. In addition, each valve shall be located with reference to objects such as edge of pavement or other visible, above-grade, permanent objects or structures. A minimum of three (3) dimensions, referenced to different permanent objects, shall be shown for each valve unless otherwise approved by the City.

NOTE:

All record drawings must be submitted with a letter of transmittal from the Engineer of Record and must include the following: project name, date, number of copies, description, and must clearly identify which of the following: water, sewer, paving, pavement markings, drainage, rock base, grading, etc. are being submitted for approval.

SECTION 5: ENGINEERING FINAL INSPECTIONS

This document is intended to provide minimum City inspection criteria. Additional criteria may be required. Consult the Department of Environmental and Engineering Services (DEES) for further information.

The Contractor shall use this checklist to perform a preliminary inspection prior to scheduling the final engineering inspection with the City. The City will subsequently perform the final inspection. It is the Contractor's responsibility to provide personnel to perform the manual aspects of the inspection (i.e., opening manhole lids, turning gate valves, operating fire hydrants, etc.).

PERFORMANCE or MAINTENANCE BOND RELEASE (circle one)

CERTIFICATE OF OCCUPANCY INSPECTION

PROJECT: _____ DATE: _____

INSPECTOR: _____ BOND #: _____

I. Water Distribution System

A. All features installed according to plan _____

B. Fire Hydrants _____

1. Height (18" to 24" to nozzle) _____

2. Direction (5 1/4 " nozzle facing access way) _____

3. Distance (4' minimum to 7' maximum from curb) _____

4. Plumbness _____

5. Manufacturer approved by Engineer _____

6. Operational _____

7. Paint (yellow barrel, bonnet color per flow test results) _____

8. Reflective markers (two blue markers in center of adjacent drive lane)

C. Gate Valves (Set to Grade) _____

1. Set to grade _____

2. Concrete collar with identification marker (in unpaved areas only) _____

3. Operational _____

- 4. Paint (blue valve box lid) _____
- 5. Reflective marker (one blue marker in center of adjacent drive lane)

D. Water Meter

- 1. Adjust meter box to grade _____
- 2. Meter box should not be broken _____
- 3. Water service line must be between 8" and 12" below meter box lid

- 4. Vertical distance between top of water meter and lid of meter box must be between 6" and 8" _____
- 5. Locate water meter box within the utility easement or one (1) foot beyond right-of-way _____
- 6. Meter is readable _____

II. Sewage Collection & Transmission System

A. All features installed according to approved plans _____

B. Collection System _____

- 1. Manhole rims shall be visible _____
- 2. Manhole rims set to grade and secure _____
- 3. Manhole lids free of asphalt/concrete _____
- 4. Manholes located in unpaved areas shall have concrete collar set to grade and free of cracks _____
- 5. Manhole interiors painted with 2 coats (Koppers 300, 1st coat red, 2nd coat black) _____
- 6. Manhole free of infiltration _____
- 7. Cleanouts set to grade _____
- 8. Any stub-out not tied into a building shall have a 2"x4" or larger marker and shall have the top 12" painted green _____

C. Force Main Transmission system _____

- 1. Valve concrete collar with identification marker (in unpaved areas only) _____
- 2. Reflective markers (one green marker in center of adjacent drive lane)

- 3. Air relief valves and manholes _____
- 4. All clean outs shall be set to grade, accessible, and clean _____

D. Pump station in full operational condition _____

III. Drainage System and Grading

A. All features installed according to plans _____

B. Grates secure _____

C. Sumps clear of debris _____

D. Outfalls complete _____

E. Pollution retardant devices _____

F. Catch basins in unpaved areas must have concrete aprons _____

G. Ditch banks to grade and slope _____

H. Lake, canal, or ditch slopes _____

I. Erosion protection _____

J. Flow lines of swales shall be below edge of pavement according to design and at a minimum longitudinal slope of 1/4" per foot _____

H. Head walls installed according to plans _____

IV. Roadways

A. Road alignment and cross-sections conform to the approved plans _____

B. Pavement

1. All features shall be installed according to approved plans including final lift _____

2. Alignments and cross-sections of all paved areas shall conform to the approved plans _____

3. Paving complete and clean _____

4. Pavement shall be free of potholes, cracks, and divots _____

5. Striping markers and signs _____

6. Curbs condition _____

7. Parking lot/spaces _____

8. Pavement markings and signage _____

C. Swales and Sidewalks

1. Swales to grade (cross-section) _____

2. Sidewalk to grade (cross-section) _____

3. Sidewalks complete and clean _____

4. Sidewalk expansion joints and flags _____

5. Wheelchair ramps _____

V. RESIDENTIAL DEVELOPMENTS

After 80% of the buildings are completed, the final layer of asphaltic concrete with appropriate striping, marking and signage shall be installed. (No certificate of occupancy or inspections until the roadway is final and approved.)

E. Miscellaneous:

- 1. Driveways shall be constructed with correct swale where appropriate, clean, set to final grade, and free from cracks.
- 2. Lots shall be clean and free from debris and stock piles. Sod installation shall be completed and properly graded to ensure effective surface water drainage.
- 3. Site lighting and street lighting shall be operational.
- 4. All existing facilities disturbed during construction shall be restored.
- 5. Permanent reference monuments with elevations shall be in place.

SECTION 6: C.O. SIGN OFF AND BOND RELEASE PROCEDURES

This document is intended to set minimum City criteria for certificate of occupancy (C.O.) sign off *, performance bond, and maintenance release procedures. Additional criteria may be required.

The Developer/Owner must provide the City with the following fifteen (15) days before the performance bond release inspection:

- 1. Record drawings.
- 2. All utility easements, access easements, legal descriptions, and sketches in recordable form.
- 3. Bill of sale for all facilities the City will be responsible for maintaining after project acceptance.
- 4. Releases of all liens for public improvements to be transferred to the City.
- 5. Completion of all items on the water distribution system section of the engineering final inspections checklist.
- 6. Completion of all items on the sewer collection and transmission system section of the engineering final inspection checklist.
- 7. Completion of all items on the roadways section of the engineering final inspection checklist.
- 8. Completion of all items on the drainage system and grading section of the engineering final inspection checklist.
- 9. The actual construction cost for all improvements.

* Department of Environmental and Engineering Services sign off is required before the Building Department issues the C.O.