



Department of Public Works & Transportation • Water & Wastewater Services

**WATER & WASTEWATER ENGINEERING DIVISION**

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**MINIMUM DRAWING REQUIREMENTS FOR  
WATER AND SEWER LINE PROJECTS**

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This document approved by the Broward County Water and  
Wastewater Services Technical Standards Committee.

Signed:  Date: 10-29-07  
Steven W. Uhrick, P.E.

This document describes the minimum format and content requirements for the Broward County Water and Wastewater Engineering Division (BCWWED) to accept design, as-built and record drawings. These requirements apply to in-house, consultant and developer projects. This document does not describe design standards, and does not relieve the engineer of record of his/ her responsibility to comply with all State and local regulations. This document does not describe drawing requirements for every situation, and some requirements may not apply in every case. It is the responsibility of the engineer of record to verify BCWWED's acceptance of non-compliance with these requirements ahead of time for a given situation.

As used in this document, the term 'coordinate' or 'coordinates' mean northing and easting values in the Florida East Zone/ NAD 83-90 HARN Feet State Plane Coordinate System. Coordinates shall be accurate to the nearest tenth of a foot and shown to a precision of the nearest tenth of a foot. BCWWED, sometimes with the help of the County Surveyor, does check the coordinates. To support checking of the coordinates, BCWWED may request the submittal of a metadata report that addresses the following:

1. Identify the coordinate datum and projection.
2. Identify control points used to establish the project coordinates. Provide full backup information regarding the source of the control point coordinate data and their coordinates. If the source control point coordinate datum/projection differs from the project coordinate datum/projection, then provide coordinates for the control points in both the source datum/projection and in the project datum/projection. Indicate the method and/or software/version utilized to make the conversion.
3. Describe the method used to establish the project coordinates.
4. Indicate the estimated accuracy of the project coordinates.

All elevations will be based on NGVD29.

## **MINIMUM DESIGN DRAWING REQUIREMENTS**

### **General**

1. Number of Submittals. For Developer projects, five paper sets are required for each submittal. For Water and Wastewater Services (BCWWS) consultants, according to your contract.
2. All drawings are to be submitted on 22" x 34" or 24" x 36" size sheets.
3. Each drawing set will have a cover sheet that includes the following:
  - a. Name of the project.
  - b. BCWWS project number.
  - c. Name of the design firm.
  - d. Design firm's project number.
  - e. Design firm's telephone number, mailing address and email address.
  - f. Engineer of Record's Name and Florida Registration Number.
  - g. Seal and Signature of the Engineer of Record.
  - h. Date of current version.
  - i. A general location map showing Broward County and major roads with the location of the project identified.
  - j. A specific location map showing local existing and proposed roads and the extent of the project.

- k. The statement: "CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH WATER AND WASTEWATER SERVICES STANDARDS AND SPECIFICATIONS. PLANS ARE IN ACCORDANCE WITH BCWWS MINIMUM DRAWING REQUIREMENTS DATED \_\_\_\_\_."
- l. For "Developer" projects, the cover sheet must also include:
- i. The Water ERU tally block filled in with the quantity, ERU Code, ERU Factor, ERU extension (to three decimal places) for each type of use; and the total water ERU.
  - ii. The Sewer ERU tally block filled in with the quantity, ERU Code, ERU Factor, ERU extension (to three decimal places) for each type of use; and the total sewer ERU.
  - iii. The Irrigation ERU tally block filled in with the quantity, ERU Code, ERU Factor, ERU extension (to three decimal places) for each type of use; and the total irrigation ERU.
  - iv. The water meter tally block filled in with the number and size of each required water meter.  
(See the website <http://www.broward.org/waterservices/eei00600.htm> for more information on ERUs.)
  - v. The cover sheet must include this statement:  
BCWWED APPROVAL OF THIS SET OF DRAWINGS IS RELIANT UPON THE DRAWINGS CLEARLY SHOWING ALL EXISTING AND PROPOSED ABOVE GROUND STRUCTURES, WALLS, FENCES, UNDERGROUND PIPING, UNDERGROUND STRUCTURES, DUCT BANKS, TRANSFORMERS, POLES, RETENTION AREAS, PAVERS, AND SIGNIFICANT LANDSCAPING WITHIN RIGHTS OF WAY AND EXISTING AND PROPOSED POTABLE WATER AND/OR SANITARY SEWER EASEMENTS. ALL EASEMENTS GRANTED TO BCWWS ARE EXCLUSIVE. BCWWS HEREBY AUTHORIZES ONLY THE ITEMS SHOWN ON THESE DRAWINGS WITHIN THE BCWWS EXCLUSIVE EASEMENTS TO BE WITHIN THE BCWWS EXCLUSIVE EASEMENTS.
- m. For "Developer" projects involving private sewers, the cover sheet must include this statement (which will be requested by BCWWED staff if applicable):  
THIS PROJECT HAS BEEN APPROVED CONTAINING PRIVATE SEWERS. PRIVATE SEWERS MAY SEVERELY LIMIT THE ABILITY TO SELL PORTIONS OF THIS PROPERTY IN THE FUTURE. ALL WATER METERS FOR THIS PROPERTY MUST BE IN THE NAME OF THE ONE ENTITY THAT IS RESPONSIBLE FOR MAINTAINING THE PRIVATE SEWERS.
- n. For "Developer" projects containing a single fire service for multiple units, the cover sheet must include this statement (which will be requested by BCWWED staff if applicable):  
THIS PROJECT HAS BEEN APPROVED CONTAINING A SINGLE FIRE SERVICE FOR MULTIPLE UNITS. THIS MAY SEVERELY LIMIT THE ABILITY TO SELL PORTIONS OF THIS PROPERTY IN THE FUTURE. ALL DOUBLE DETECTOR CHECKS AND BYPASS METERS FOR THIS PROPERTY MUST BE IN THE NAME OF THE ONE ENTITY THAT IS RESPONSIBLE FOR MAINTAINING THE FIRE SERVICE SYSTEM.
- o. The township, range and section the project is in.
- p. The legal description of the project property.

4. A drawing index shall be included on the cover sheet or first sheet following the cover sheet.

5. Each sheet, except the cover sheet, shall include:

- a. Title Block
- b. North Arrow oriented to the top or right of the plan view or location map.
- c. Engineer of Record's Name and Florida Registration No.
- e. Seal and Signature of the Engineer of Record.
- f. Scale, horizontal and vertical (for profiles).
- g. Date of current version.
- h. At Engineer of Record's option, a revision block.
- i. Match lines and/or key plan to assist in sheet to sheet navigation.

6. The drawing set will contain an overall layout of the proposed project on a single sheet, indicating all phases of construction, existing and proposed mains. The overall layout will be oriented so north is the top of the sheet. For drawing sets containing more than one plan view sheet, the overall layout will show the coverage of each plan view sheet.

7. All dimensioning will be in English units.

8. All information on the drawings must be clear and understandable to BCWWED.

9. All "standard details" will be in compliance with BCWWS requirements. (See the website <http://www.broward.org/waterservices/eei01100.htm> for more information on standard details.)

10. The drawing set will contain a list of abbreviations used and their meaning, and a legend of symbology used with its meaning.

11. Sheets will be numbered using some type of sequential numbering system so it is clear that sheets are not missing from the set. The numbering system used is up to the Engineer of Record as long as it is understandable to BCWWED.

### **Piping Plan Views**

1. Horizontal scale to be engineering scales of 1" = 10', 1" = 20' or 1" = 30'. The scale will be selected so drawings are readable, in the opinion of BCWWED. Larger scale blow-ups or details may be required in congested areas.

2. Show the size of all water and irrigation meters, and indicate if meter box is a "double meter" box.

3. Indicate facilities that are or will be owned by BCWWS verses private or other utilities' facilities.
4. Show the design location of all BCWWS facilities, including distance from rights-of-way lines and/or easement for each potable water/ sanitary sewer facility.
5. Each main will be marked with its size and type of material. Gravity pipes will also be marked with their length and slope. Each fitting will be marked with its size. Each fitting will be marked with its material if the material is different than the main's material. Valves will be marked with their size and type. Each water service line will be marked with its size. Each water service line and sewer lateral will be marked with its material unless the material is specified in a note or detail.
6. Show all main horizontal and vertical deflection points. A deflection point is a change in horizontal or vertical alignment other than the normal minor alignment change associated with a "straight" pipe.
7. Show and label all public and private roadways. Indicate when roadways are private.
8. Show and dimension all rights-of-way and easements and reference as to whether by plat or otherwise. All easements to be identified as to type: General Utility Easements, Broward County Water/Sewer Easements, FP&L Easements, etc.
9. All existing, proposed and to be abandoned utilities will be shown. Line type and/or weight will be used to differentiate between type of utilities and between existing, proposed and to be abandoned. The method of abandonment will be shown.
10. Show all known potential underground conflicts, using "blow-up" views when necessary. Show vertical clearances between BCWWS potable water/ sanitary sewer facilities and other features.
11. Show the location of all bacteriological sampling points. If the sampling points are subsequently modified during the Health Department permitting process, the Engineer of Record will adjust the drawings accordingly and resubmit to BCWWS for re-approval.
12. For developer projects:
  - a. Clearly indicate all boundary lines for any property to be served. Show coordinates for boundary property corners.
  - b. Show the outline of each building to be serviced. Except for single family and multi-family residential buildings, indicate the total gross square footage of each building. For multi-family residential buildings, show the number of units in the building. Show the postal address for each served building (if the addresses are available at the time – addresses must be included in record drawings). For buildings with multiple postal addresses, show the postal address for each bay, apartment, etc.

- c. Indicate pavement and parking areas and pavement types.
- d. Show all walls, fences and gates and indicate the type and height of the wall and/or fence.
- e. Show all wet or dry storm water retention areas.
- f. Show all structures, walls, underground piping, underground structures, duct banks, signs, trees, other significant landscaping, poles, transformers and any other item within rights of way, existing easements or proposed easements that could potentially hinder the maintenance of the water or sewer systems.
- g. Show the location of any fire pumps and indicate their design capacity. Label as such each fire lines with no fire pumps.
- h. Show the location of any oil/water and/or sand separators to be constructed as part of the project.
- i. If fire hydrant locations are subsequently modified during the permitting process, the Engineer of Record will adjust the drawings accordingly and resubmit to BCWWS for re-approval.

## **Piping Profiles**

1. Profiles are required for sewer gravity mains. Profiles are normally optional for sewer force mains and water mains, but may be required by BCWWED under some circumstances.
2. Special details are required where resolution of vertical conflicts must be shown.
3. Vertical scale to be between 1" = 1' and 1" = 3'.
4. All profiles will show the profile grade line and other possible conflict features such as storm water pipes and other utilities.
5. Sewer gravity main profiles will contain linear footage between manhole centerlines, invert elevations at center of manholes, rim elevations, slopes, drops with inverts and numbering of manholes.

## **MINIMUM AS-BUILT DRAWING REQUIREMENTS**

As used in this document, the term 'as-built drawing' refers to drawings signed and sealed by a Florida registered surveyor and mapper (PSM). As-built drawings are not provided to BCWWED unless requested by BCWWED. As-built information will be provided to the Engineer of Record who will prepare or have prepared record drawings based on as-built information provided by the PSM and from information provided by the engineer's staff. At

the Engineer of Record's option, the PSM can prepare record drawings in lieu of as-builts.

Each sheet of as-built drawings shall be signed and sealed by the PSM. The cover sheet shall be signed and sealed and contain the following statement: "I hereby certify that the as-built location information of the water and sewer facilities shown on these drawings conforms to the minimum technical standards for land surveying in the State of Florida, chapter 61G17-6 (Florida Administrative Code), as adopted by the Department of Business and Professional Regulation, Board of Professional Surveyors and Mappers in September 1981, and that said as-builts are true and correct to the best of my knowledge and belief as surveyed under my direction." The cover sheet shall include the PSM's name, business name, PSM number, address and telephone number.

As-builts will contain the information on the design drawings, plus the following additional requirements.

1. As-builts are to document changes between the design and construction. All information that is incorrect due to changes during construction will be corrected. Incorrect or no longer relevant information will be erased or struck through. Any BCWWS facilities constructed in a horizontal or vertical location materially different (one-tenth foot horizontal, one-tenth foot vertical) than the design location will have their design location struck through and will be redrafted at the constructed location. Design drawing dimensioning to water and sewer facilities will be corrected as necessary.
2. Drawings will be a complete set including cover sheet, index (if one was included in the approved design drawings) and any other sheets included in the approved design set. Standard detail sheets are not necessary.
3. Drawings will include the MINIMUM AS-BUILT AND RECORD DRAWING CONTENTS described elsewhere in this document.

## **MINIMUM RECORD DRAWING REQUIREMENTS**

As used in this document, the term 'record drawing' refers to the final drawing set signed and sealed by the Engineer of Record. The Engineer of Record will prepare or have prepared record drawings based on as-built information provided by a PSM and from information provided by the engineer's staff. The Engineer of Record shall retain the signed and sealed 'as-built' drawings provided by the PSM with the other project records for possible review by BCWWED upon request.

Each sheet of the record drawings must be signed and sealed by the Engineer of Record. The cover sheet is to be signed and sealed by the Engineer of Record and shall include the

following statement: "I certify that these record drawings have been reviewed by me or by individual(s) under my direct supervision and that these drawings incorporate the information contained in the certified as-builts. To the best of my knowledge and belief these record drawings substantially reflect the water and sewer facilities as constructed. The accuracy of these record drawings is reliant on the accuracy applied by the surveyor that prepared the certified as-builts, which was [include the surveyor's name, business name, PSM number, address and telephone number]. The surveyor has certified to me that the as-built location information of the water and sewer facilities conforms to the minimum technical standards for land surveying in the State of Florida, chapter 61G17-6 (Florida Administrative Code)."

At the Engineer of Record's option, the PSM can prepare record drawings in lieu of as-builts.

Record Drawings will contain the information in the design and as-built drawings (including cover sheet, overall layout, blowups, details, standard details, legends, etc.), plus the following additional requirements.

1. Number of Submittals. Two paper sets are required for the first and each subsequent submittal. BCWWED consultants are required to submit record drawings in AutoCAD format in addition to the paper sets. Check with BCWWED's GIS group for more information on the format of the AutoCAD submittal. For BCWWED consultants, according to your contract.
2. Drawings are to show as constructed information, not document changes between the design and construction. Any BCWWS facilities constructed in a horizontal or vertical location different (one-tenth foot horizontal, one-tenth foot vertical) than the design location will have their design location erased and will be redrafted at the constructed location. All information that is incorrect due to changes during construction will be corrected. Incorrect information will not be struck through; it will be erased and replaced with the corrected information. Any information that is no longer relevant due to changes during construction will be deleted. Design drawing dimensioning to water and sewer facilities will be corrected as necessary.
3. Drawings will be a complete set including cover sheet, index (if one was included in the approved design drawings) standard details and any other sheets included in the approved design set.
4. Drawings will include the MINIMUM AS-BUILT AND RECORD DRAWING CONTENTS described elsewhere in this document.

5. Additional requirements if the record drawings are prepared by the PSM.
  - a. Each sheet of record drawings shall be signed and sealed by the PSM.
  - b. The cover sheet shall be signed and sealed by the PSM and contain the following statement: "I hereby certify that the as-built location information of the water and sewer facilities shown on these drawings conforms to the minimum technical standards for land surveying in the State of Florida, chapter 61G17-6 (Florida Administrative Code), as adopted by the Department of Business and Professional Regulation, Board of Professional Surveyors and Mappers in September 1981, and that said as-builts are true and correct to the best of my knowledge and belief as surveyed under my direction."

## **MINIMUM AS-BUILT AND RECORD DRAWING CONTENTS**

1. The amount of information required on as-built and record drawings will require the drawing author to organize its presentation in order to make the drawings readable. On occasion, it may be necessary to put water and sewer information on separate sheets, and/or use a table to show coordinate information.
2. Show the location of easements used by the water and sewer facilities.
3. Indicate pipe joint locations where water and sewer or reclaimed water piping crosses.
4. Indicate the length of gravity sewer piping and actual slope between manhole centers.
5. Show all abandoned in place facilities including the extent and method of abandonment.
6. Show elevations to the nearest tenth of a foot for:
  - a. Top of pipe for water mains, force mains and reclaimed water mains at vertical deflection points and every 200 feet along straight runs.
  - b. Top of pipe of water or sewer facilities where they cross all other facilities (drainage, telephone, cable TV, electric, etc.)
7. Show elevations to the nearest one hundredth of a foot for:
  - a. Manhole rims.
  - b. Inverts of every gravity sewer pipe and force main connections to manholes.
  - c. Lift station top of slab, bottom of wet well, influent pipe invert and control set points.

8. Coordinates will be provided for BCWWS maintained facilities, including:
  - a. Water mains, force mains and reclaimed water mains at deflection points and every 200 feet along straight runs.
  - b. The center of each manhole, fitting, valve, blow off, hydrant, water meter box, sewer cleanout, lift station wetwell, double detector check or other non-pipe water or sewer facility.
  - c. The location of each connection to existing facilities.
  - d. The corners (vertices) of all easements being granted to the County as a part of the project.
  - e. Other locations designated by BCWWED.
  
9. Show the changed location of any non-water/sewer features so they are at the visually correct location relative to BCWWS maintained facilities.