



# City of Baldwin As-Built Commercial Site Checklist

Name of Development \_\_\_\_\_ City Project No. \_\_\_\_\_

Address of Development \_\_\_\_\_ Date of Review 1<sup>st</sup> \_\_\_\_\_

2<sup>nd</sup> \_\_\_\_\_ 3<sup>rd</sup> \_\_\_\_\_

## AS-BUILT STORMWATER MANAGEMENT REPORT

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		Provide an as-built stormwater management report with date and signed Professional Engineer's seal.
		Vicinity map with the site boundary delineated.
		Project description, pre-developed and post-developed conditions narrative.
		Mapping of soils from USDA soil survey and location of any site borehole investigations that may have been performed.
		Pre-developed and as-built post-developed drainage area maps and 10% downstream area map with on-site and off-site basins delineated separately. Designation, drainage area, travel path, and study point location of each basin. Topography at 2-foot elevations for all on-site basins. Topography for all off-site basins. Basin delineation corresponds with topography. Basins are delineated and analyzed at each location/study point where runoff leaves the site along each property line.
		Time of concentration calculations for each basin based on the travel path provided on the drainage area maps. Maximum length for sheet flow is 100 ft. Minimum time of concentration used in analysis is 5 minutes.
		Georgia Stormwater Management Manual Stormwater Quality Site Development Review Tool that includes all disturbed basins. Overall site has minimum 80% TSS removal. BMP tracking forms.
		Assure credits used are valid for site (natural conservation area, etc.) NOTE: Easement for natural conservation area must be recorded.
		Stage/storage tables for permanent pool and forebay.
		Required and provided water quality volume calculations. Provided water quality volume is greater than or equal to required water quality volume.
		Required and provided channel protection volume calculations. Provided channel protection volume is greater than or equal to required water quality volume.
		SCS method used for storage volume.
		Hydrograph return period recap, summaries, and reports for the 1, 2, 5, 10, 25, 50, and 100 year storms of all basins including the 10% downstream basin. Post-developed flows are equal to or less than pre-developed flows at each location/study point where runoff leaves the site along each property line and at 10% point.
		Latest 24-hour rainfall data from NOAA Atlas 14, Volume 9, Version 2.

		As-built pond report for each pond with a stage/storage table beginning at the required routing elevation with culvert, orifices, weirs, and discharge data used to develop the pond routing hydrographs. Routing elevation is not lower than permanent pool elevation for a stormwater pond. The highest elevation in the stage/storage table corresponds with the lowest elevation of the dam.
		Outlet control structure detail with as-built dimensions and elevations of all inlets and outlets and drain protection. Diameter and material of outlet pipe and pipe to drain pond. Steps to access inside the OCS.
		Calculations to verify the pond outlet pipe and OCS have adequate capacity for 125% of the 100 year routed outflow or an emergency spillway has been provided.

**AS-BUILT SURVEY**

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		Name of project. Name, address, and phone number of owner/developer, engineer, surveyor, and contractor.
		Tax parcel number, address, zoning, land district, land lot, and county of site.
		Scale of 1 inch = 60 feet or larger detail.
		Topography at 2-foot elevations of the entire pond including downstream side of the dam and within the drainage easement around the pond.
		Minimum required parking spaces. Minimum required handicap accessible spaces. Parking space, aisle dimensions.
		For underground detention systems, proprietary devices, and water quality BMPs, provide dimensions, state plane coordinates, mean sea level elevations, and drainage easements.
		Maximum side slopes of a pond including the downstream side of the dam is 3:1. 15-foot safety bench unless pond slopes are 4:1 or flatter. 15-foot wide aquatic bench if permanent pool is 4 feet or deeper.
		Low point spot elevations in the permanent pool, forebay, in front of OCS and spot elevations along both sides of the top of dam of the pond.
		Delineate and label the 100-year storm elevation, permanent pool elevation (if applicable), and the cleanout elevation of the pond. (Note the corresponding mark on the silt gauge.)
		Delineate and label top of dam/wall elevation (lowest elevation) and minimum width of pond. Minimum top of dam width is 10 feet.
		Minimum 1 foot of freeboard between 100 year elevation and top of dam elevation of pond.
		Delineate and label top of berm elevation between permanent pool and forebay in pond.
		Bottom of forebay elevation is equal to or greater than permanent pool elevation.
		Forebay depth is 4-6 feet.
		Date of field run survey.
		Site boundary and adjacent road name and right-of-way.
		Delineate and label centerline of stream, state waters buffer, and City of Baldwin stream buffer and impervious setback.
		Delineate 100 year floodplain. FIRM panel number and date.
		Delineate and label all drainage and access easements. Ensure easement around the pond is measured a minimum of 20 ft. from the as-built 100-year storm elevation. Include width of easement.

		Delineate and label the silt gauge, benchmark/control point, outlet control structure, and all stormwater drainage structures with state plane coordinates and mean sea level elevations. Drainage structure type and designation that corresponds with designation on the approved construction plans.
		100-year ponding limit and elevation at all inlets. Include intercept efficiency percentage at all catch basins and inlets not at low point.
		Maximum spacing of drainage structures is 500 ft.
		Diameter and material of all storm drain pipes.
		Locate drainage structure at every change of direction and grade of storm drain pipe. Minimum angle between storm drain pipes entering and exiting drainage structure is 90°.
		Storm drain pipes under road are perpendicular to road. Storm drain pipes under roads and in streams are RCP.
		Delineate and label drainage easement around all storm drain pipes and channels. Ensure easement width corresponds with pipe diameter and depth table in Chapter 6 of the City of Baldwin, Georgia Code of Ordinances. Label width of easement. Storm drain pipe is in the center of easement and no buildings or other structures shall be within the easement.
		Outlet control structure detail for each pond with as-built dimensions and elevations of all inlets and outlets and drain protection. Diameter and material of outlet pipe and pipe to drain pond. Steps to access inside the OCS.
		Location of structures, utilities, tree line, drives, lakes, ponds, natural conservation area, etc.
		Delineate and label 12-foot wide access easement to the pond, structural stormwater control, water quality BMP from the right-of-way of a road. Drainage structures are not located within the access easement.
		Riprap at all inlet and outlet headwalls, flared end sections, and safety end sections.
		Signed and dated Professional Engineer's seal and note stating the stormwater management facility is functioning as designed and the required detention storage and outflow rates are being provided.
		Delineate and label fence and gate location.
		Note stating no obstructions shall be built, constructed or planted within the stormwater management facility, its associated drainage or access easements.
		Note stating no construction activity allowed within existing and future floodplain limits without approved Floodplain Management Plan.
		Direction of north in relation to the site shown on the plan (indicate magnetic, true, or grid) and graphic scale.
		Signed registered land surveyor's seal.

### AS-BUILT STORM DRAIN PIPE PROFILES

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		Storm drain pipe profiles.
		Horizontal and vertical scale.
		Pipe diameter, material, length, and slope.
		Gauge and corrugation of aluminized steel pipe.
		Class of reinforced concrete pipe.
		Ground line.
		25 year/100 year HGL.

		Drainage structure type and designation with invert elevations, top of structure and /or throat elevation for catch basins, top of structure and weir elevations for weir inlets, and inlet elevation for curb and drop inlets.
		Delineate pipe(s) and include upstream structure designation with invert elevation associated with drainage structure that has multiple inlets.
		Maximum drop in drainage structure is 10 feet.
		Minimum cover of 1 foot over pipes.
		Minimum pipe diameter of 18 inches. Minimum roof drain diameter of 12 inches.
		Minimum slope of 0.50%.
		If aluminized steel and HDPE pipes exceed 14% slope, provide documentation that anchor collars were installed per manufacturer's recommendations.
		If RCP exceeds 10% slope, provide documentation that anchor collars were installed per manufacturer's recommendations.
		All utility crossings with diameter, material, and vertical clearance.
		Signed registered land surveyor's seal.
		Signed, dated professional engineer's seal.

**AS-BUILT CHANNELS**

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		As-built cross-section every 200 ft. with dimensions and at every change in cross-section dimension. Minimum bottom width of 2 feet. Maximum side slopes of 3:1 with vegetative lining. Maximum side slopes of 2:1 with riprap or concrete.
		As-built topography at 2-foot elevations within channel drainage easement. Date of survey and reference datum.
		Channel designation
		Drainage area
		Discharge (25 yr. and 100 yr.)
		Runoff coefficient
		Manning's roughness coefficient
		Velocity (25 yr.)
		Normal depth (25 yr. and 100 yr.)
		Overall minimum channel depth
		Channel length and slope
		Lining
		Signed registered surveyor's seal.
		Signed, dated professional engineer's seal.

**AS-BUILT STORM DRAIN PIPE CHART**

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		Upstream and downstream structure type and designation
		Pipe number, diameter, material, length, and slope
		Drainage area
		Discharge
		Storm frequency and intensity (25 yr./100 yr.)
		Runoff coefficient and frequency factor

		Manning's roughness coefficient
		Velocity (25 yr.)
		Maximum velocity is 15 ft/s.
		Signed, dated professional engineer's seal.

**AS-BUILT WATER SYSTEM**

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		Scale of 1 inch = 60 feet or larger detail for plan view.
		All water lines are C-900 and/or DIP.
		Minimum pipe diameter of 6 inches allowed on dead end cul-de-sac streets less than 1,000 feet in length, or lines that are looped. All other areas, minimum pipe diameter is 8 inches.
		Location, diameter, and material of all water mains and service laterals.
		Location and size of vacuum and air release valves (installed at the highest points in the system).
		Delineate and label all fire hydrants.
		Maximum spacing of fire hydrants is 500 feet.
		Delineate and label all water valves and other appurtenances.
		Water valve in every direction at each intersection (i.e. 3 valves at a 3 way intersection, 4 valves at a 4 way intersection).
		Maximum spacing of in line valves is 1,000 feet.
		Location, diameter, and material of all water lines surrounding the site.
		Specify methods and tie-in locations with mains (i.e. tapping sleeve and valve labeled with the diameter).
		Location and size of water meters. Water meters are located a maximum of 3 feet beyond the property line.
		Long side service has been installed with 2-inch PVC sleeves under pavement.
		Each service has its own tap from the distribution line. No double services allowed.
		Label all road right-of-ways and easements.
		Steel casing for water mains under pavement. Length of steel casing.
		Dimensions, stations, and labels of water line relative to features such as right-of-way, centerlines, edge of pavement, coordinates, etc.
		Fire hydrants are a minimum of 6 feet behind curb.
		Water valves are outside of pavement.
		12-gauge, solid strand detection wire shall be installed above all waterlines with waterproof connectors and connections at every valve and hydrant.
		Marking tape with "Caution Buried Waterline" shall be installed approximately 18 inches above all waterlines.
		Cross minor streams/creeks under or beyond culvert/storm drain pipe. Plan view and cross-section of crossing with ground line, vegetative buffer, side slopes, depth of cover, creek, culvert/storm drain pipe, elevations, water line and any fittings. Additional easements as necessary.
		Aerial crossings shall not be permitted.
		Table with columns for all water line diameter, material, and length.
		Signed registered land surveyor's seal.
		Signed, dated professional engineer's seal.

## AS-BUILT SANITARY SEWER SYSTEM

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		All sanitary sewer main testing and construction completed.
		Gravity sanitary sewer main video has been submitted to City
		Scale of 1 inch = 60 feet or larger detail for plan view.
		Elevation data referenced to mean sea level and survey referenced to state plane coordinate system including all new manholes.
		Label perpetual sanitary sewer easements.
		Label all sanitary sewer pipe diameter and material.
		Label all manholes and service line cleanouts.
		Label manhole deflection angles.
		SDR 26 PVC sanitary sewer lines under pavement shall be constructed with at least 7 ft. of pipe cover. Otherwise DIP shall be used.
		Minimum cover shall be 3 feet over DIP sanitary sewer pipes. Except under roadways shall be 4 ft.
		Steel casing for PVC sanitary sewer lines crossing under pavement. Size and length of steel casing.
		Gravity sanitary sewer pipe shall be SDR 26 PVC or DIP Pressure Class 350 for 8"-12" and Pressure Class 250 or 350 for 14"-36" depending on design with Tnemec Perma-shield PL or Protecto 401 interior coating. Cement lining of DIP is not allowed for sanitary sewer applications.
		Maximum spacing of manholes is 400 feet.
		Minimum sanitary sewer pipe diameter of 8 inches. Minimum service lateral diameter is 6 inches.
		Minimum slope is 0.50%.
		Maximum slope is 15.0%.
		Service laterals are SDR 26 PVC.
		Rim elevation of manholes outside of pavement are 1.5 feet above ground unless located in a landscaped area or close to the edge of pavement.
		Manhole located at every change of direction and grade of sanitary sewer line. Minimum angle between sanitary sewer lines entering and exiting manhole is 90°.
		Service line connections to gravity sanitary sewer line or manhole for residential. Commercial service line connections shall be connected to a manhole.
		A 20 foot permanent, recorded easement around all 8 inch through 18 inch diameter sanitary sewer lines with up to 20 feet of cover and a 40 foot permanent, recorded easement shall be required if cover is over 20 feet outside of right-of-way. A 40 foot permanent, recorded easement on all 24 inch diameter sanitary sewer lines regardless of depth of cover. The sanitary sewer line is in the center of the easement and no buildings or other structures are within the easement. Easements shown on all plat.
		Location, diameter, and material of all sanitary sewer lines.
		Location, diameter, and material of all service laterals.
		Location, diameter, and material of all force mains.
		Location and size of grease trap(s). Minimum size is 1,500 gallons.
		Manholes numbered on the plan with corresponding numbers on the profile.
		Minimum drop from invert in to invert out elevation is 0.20 feet. Any drop from invert in to invert out elevation greater than 2 feet constructed as an outside drop manhole.
		No sanitary sewer lines installed through stormwater/detention ponds including the dam or within its drainage easement.

		Location, diameter, and material of all sanitary sewer lines surrounding the site.
		Location, size, and invert elevations of all special features such as connections to sanitary sewers, concrete encasement, collar walls, elevated sanitary sewer piers, etc.
		Location of all structures, above and below ground, particularly water mains, gas mains, storm drains, utility conduits, etc.
		Label all streets, right-of-ways, and easements.
		Dimensions, stations, and labels to indicate location of sanitary sewer line relative to features such as right-of-way, centerlines, edge of pavement, coordinates, etc.
		Aerial sanitary sewer lines above the 50-year flood line and delineated as such on the plans.
		Location and elevation of adjacent parallel streambeds and adjacent lake/pond surfaces on the plan and profile.
		No trees within permanent water or sanitary sewer easements or above fire protection water mains.
		Minimum of 10 feet horizontal distance between water and sanitary sewer lines and storm drain pipes.
		Minimum 18 inches vertical distance between water and sanitary sewer lines.
		Minimum 1 foot vertical distance between water and sanitary sewer lines and storm drain pipe.
		Marking tape with "Caution Buried Sanitary Sewer line" shall be installed approximately 18 inches above all sanitary sewer lines.
		All sewage pumping stations shall have an auxiliary power source and yard hydrant for wash down purposes. A remote telemetry system compatible with the City's existing system shall be provided.
		Sand traps and oil separators with sample station manholes installed in all sanitary sewer service lines from service stations, garages, car washes, and similar operations. Domestic sewage shall not pass through sand traps, oil separators, or sample stations.
		Grease traps and sample station manholes installed in process waste lines of all sanitary service sewers for commercial, industrial, and institutional establishments with food preparation areas. Domestic sewage shall not pass through grease traps or sample stations.
		Rainwater prevented from entering the sanitary sewer at all dumpster pad locations.
		Oil separators sized to handle two times the expected flow rate.
		Sample station manholes may be required on commercial, industrial, and institutional sanitary service sewers. Domestic sewage shall not pass through sample station manholes.
		Signed registered land surveyor's seal.
		Signed, dated professional engineer's seal.

### AS-BUILT SANITARY SEWER PROFILES

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>

		Sanitary sewer profiles.
		Horizontal and vertical scale.
		Pipe diameter, material, length, and slope.
		Ground line.
		Manhole numbers corresponding to plan numbers.
		Manhole elevations (top, invert in, invert out, outside drop at top and bottom).
		Minimum cover of 4 foot over pipes.

		Minimum pipe diameter of 8 inches.
		Minimum slope of 0.50%.
		Maximum slope of 15.0%.
		All utility crossings with diameter, material, and vertical clearance.
		Signed registered land surveyor's seal.
		Signed, dated professional engineer's seal.

**MISCELLANEOUS AS-BUILT REQUIREMENTS**

**1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup>**

		Provide a CD with digital as-built plans in AutoCAD, signed, dated pdf file(s), and stormwater management report.
		Provide an ASCII point file in PNEZD format with point locations of all structures, valves, manholes, water meters, etc.
		Submit a maintenance agreement that includes all structural stormwater controls.
		Submit professional certifications for installation of site specific items such as retaining walls, proprietary devices, etc.
		DRI requirements have been completed.
		All punchlist items from field inspection have been completed.