



## City of Ann Arbor

### PLANNING & DEVELOPMENT SERVICES — CONSTRUCTION SERVICES

301 E. Huron Street | P.O. Box 8647 | Ann Arbor, Michigan 48107  
p. 734.794.6263 | f. 734.994.8460 | [building@a2gov.org](mailto:building@a2gov.org)

## IMPERVIOUS AREA WORKSHEET CHECKLIST ONE AND TWO FAMILY HOMES

[www.a2gov.org/StormResidentialConstruction](http://www.a2gov.org/StormResidentialConstruction)

This guideline is a supplement to the Grading/SESC permit application for one and two family projects that are adding impervious area. If the new impervious area is greater than 200 sq ft you must provide stormwater management.

All one and two family submissions are reviewed under Chapter 55, Section 5.22 of City Code for conformance with stormwater management requirements that went into effect March 1, 2011.

**Please complete this checklist prior to submittal:**

- Completed Impervious Area Worksheet
- Sign and Date the Impervious Area Worksheet
- Grading Permit Application
- Two sets of Grading Plans that also show:
  - All existing impervious area
  - The impervious area to be constructed
  - The impervious area to be removed
  - The proposed stormwater treatment measure(s), if any
  - Any necessary downspout disconnections

**Failure to include all required items may result in rejection of the plan or delays in approval.**

### Purpose of the Impervious Area Worksheet

In compliance with the City's Federal Stormwater Permit requirements, new and redeveloped projects within the City of Ann Arbor must incorporate stormwater treatment measures or Best Management Practices (BMPs) to minimize the discharge of pollutants to storm drain systems and local waterways. Stormwater BMPs include source controls, design measures and post-construction stormwater treatment controls.

“Impervious surface” means that part of a developed parcel that has been modified to reduce the land's natural ability to absorb and hold rainfall. It includes hard surfaces which cause water to run off the surface in greater quantities or at an increased rate of flow from the flow that existed under natural conditions prior to development. For example, common impervious surfaces include, but are not limited to, rooftops, walkways, patios, courtyards, driveways, parking lots, storage areas, concrete or asphalt paving, gravel roads, or any cleared, graded, graveled or compacted surfaces, or other surfaces which similarly impede the natural infiltration of surface water into the soil.

### Notice

The City of Ann Arbor Stormwater Utility rate structure provides credits for the installation of rain gardens, rain barrels, drywells, and cisterns on single and two family properties. In some cases the stormwater management volume required by Chapter 55 may be less than the minimum requirements for the City's residential stormwater credits. If you are interested in receiving a credit on your quarterly stormwater bill for treatment measure included in your project, please visit <http://www.a2gov.org/storm> to verify your treatment measure will meet those minimum requirements before the design is complete and plans are submitted.

## Stormwater Code Requirements

On Nov. 4, 2010, City Council approved an ordinance (Ordinance No. ORD-10-36) to amend the stormwater code (Chapter 55) to require stormwater management on single and two-family residential properties when properties increase impervious area by 200 or more square feet. Examples of impervious surfaces include, but are not limited to, rooftops, walkways, patios, courtyards, driveways, parking lots, storage areas, concrete or asphalt paving, gravel roads, or any cleared, graded, graveled or compacted surfaces, or other surfaces which similarly impede the natural infiltration of surface water into the soil.

All grading permit applicants for projects creating new impervious areas must complete an impervious area worksheet and submit it to the Planning and Development Services Unit along with their grading permit application. If the new impervious area is greater than 200 square feet then stormwater management must be provided. If the new impervious area is less than 200 square feet then no further information is necessary to obtain a grading permit.

## Frequently Asked Questions

### Who do I contact if I have questions?

For general permit questions, contact the City's Permit Desk at (734) 794-6267.

For specific permit or project questions contact:

#### Peter Stephens

Land Development Coordinator

Email - PStephens@a2gov.org

Phone - (734) 794-6000 ext. 42592

For questions about the residential stormwater code requirement program, call:

#### Jerry Hancock

Stormwater and Floodplain Programs Coordinator

Email - JHancock@a2gov.org

Phone - (734) 794-6430 ext. 43709

### What were the amendments to Chapter 55?

The amendments to Chapter 55 require control of stormwater runoff from the "first flush" storm event on single and two-family residential property when adding 200-square feet or more of impervious area to the property. The "first flush" is the runoff from the first inch of rain during any storm event and carries approximately 90 percent of pollutants.

The new requirement would only apply to the increase in impervious area. Examples of impervious surfaces include, but are not limited to, rooftops, walkways, patios, courtyards, driveways, parking lots, storage areas, concrete or asphalt paving, gravel roads, or any cleared, graded, graveled or compacted surfaces, or other surfaces which similarly impede the natural infiltration of surface water into the soil.

### How can I find out more information about stormwater management?

Single Family Residential storm water management information and forms:

**[www.a2gov.org/StormResidentialConstruction](http://www.a2gov.org/StormResidentialConstruction)**

Stormwater Utility Rates and Credits:

**[www.a2gov.org/storm](http://www.a2gov.org/storm)**



**City of Ann Arbor**  
**Planning & Development Services**  
 Phone: 734.794.6263 Fax: 734.994.8460

**Impervious Area Worksheet**  
**For Single Or Two-Family Residential**  
**Development**

Applicants for all projects creating new impervious area must fill out this worksheet and submit it to the Planning and Development Services Unit with their Grading permit application. If the new impervious area is greater than 200 sq ft you must provide stormwater management.

Property Address \_\_\_\_\_ Date \_\_\_\_\_

Applicant Name \_\_\_\_\_

Homeowner Name (If Different than Applicant) \_\_\_\_\_

**IMPERVIOUS AREA CALCULATION**

**Impervious Area to be Constructed**

Structures (measure from outer edge of eaves)	+ _____ sq ft
Parking/storage areas (including on-site driveways)	+ _____ sq ft
Walkways	+ _____ sq ft
Patios and Courtyards	+ _____ sq ft
Other (specify _____ )	+ _____ sq ft

**Constructed Impervious Area Subtotal**

**+ \_\_\_\_\_ sq ft**

**Existing Impervious Area to be Removed**

Structures (measure from outer edge of eaves)	- _____ sq ft
Parking/storage areas (including on-site driveways)	- _____ sq ft
Walkways	- _____ sq ft
Patios and Courtyards	- _____ sq ft
Other (specify _____ )	- _____ sq ft

**Removed Impervious Area Subtotal**

**- \_\_\_\_\_ sq ft**

+ _____ sq ft	Minus	- _____ sq ft	=	_____ sq ft
<b>Constructed Impervious Area</b>		<b>Removed Impervious Area</b>		<b>New Impervious Area</b>

If the “**New Impervious Area**” is less than 200 sq ft, no further information is necessary. Include this worksheet with the Grading Permit Application.

If the “**New Impervious Area**” is greater than 200 sq ft, storage of the First Flush (the first inch of runoff during a storm event) is required for the net new impervious area. Continue to the next calculation on the reverse side of this worksheet.

The Rules of the Washtenaw County Water Resources Commissioner have been used to derive the following formula for the required First Flush storage:

$$\text{Square Footage of New Impervious area} \times 0.08 = \text{Cubic Feet of storage volume required}$$

Multiply your "New Impervious Area" by 0.08 to determine the volume of storage required for your site.

sq ft	x	0.08	=	cubic feet
New Impervious Area				Required Volume

### STORMWATER TREATMENT MEASURE INFORMATION

As with all grading permit applications, you will need to include a plan that shows: all existing impervious area, impervious area to be constructed, impervious area to be removed, proposed stormwater treatment measure(s), and any necessary downspout disconnections. The following stormwater treatment measures can be utilized to manage the "Required Volume". The "Total Capacity" of the proposed storm water treatment measure must be greater than or equal to the "Required Volume". Please indicate below the size of the proposed storm water management treatment measure that is chosen for this project:

Treatment Measures	Conversion Formula	Storage Volume
Rain Barrel	gallons x 0.13369 =	cubic feet
Rain Garden/Bioretention	ft (length) x ft (width) x 0.75 ft (average depth) =	cubic feet
Drywell (with pea stone)	ft (length) x ft (depth) x ft (depth) x 0.3(stone void) =	cubic feet
Cistern	_____ gallons x 0.13369 OR ft (radius) x _____ ft (radius) x 3.14 x _____ ft (depth)=	_____ cubic feet
Swale	_____ ft (length) x _____ ft (width) x _____ ft (average depth) =	cubic feet
Storage Basin	_____ ft (length) x _____ ft (width) x _____ ft (average depth) =	cubic feet
Porous Pavement (30% of subgrade infiltration area)	_____ ft (length) x _____ ft (width) x _____ ft (average depth) x 0.3 =	_____ cubic feet
Other:		cubic feet
<b>Total Capacity***</b>		<b>_____ cubic feet</b>

Links to information about these treatment measures are available at [www.a2gov.org/storm](http://www.a2gov.org/storm). For specific numeric sizing criteria used for their design, please reference The Rules of the Washtenaw County Water Resources Commissioner, [www.ewashtenaw.org/government/drain\\_commissioner/dc\\_webPermits\\_DesignStandards/dc\\_Rules](http://www.ewashtenaw.org/government/drain_commissioner/dc_webPermits_DesignStandards/dc_Rules) or the Low Impact Development Manual for Michigan, [www.semcog.org/LowImpactDevelopment.aspx](http://www.semcog.org/LowImpactDevelopment.aspx).

Chapter 55, Section 5.22.2 also requires all downspouts to be directed to vegetated areas. If existing downspouts are connected to the City's storm water management system or are directed to impervious area, please show how these downspouts will be redirected to vegetated areas.

\*\*\* Notice: The required stormwater management volume for residential development projects may or may not meet the minimum requirements for the City's residential stormwater credits. Please visit <http://www.a2gov.org/storm> to verify your treatment measure will meet those minimum requirements if you are interested in receiving a credit on your quarterly stormwater bill.

Signature of Applicant \_\_\_\_\_ Date \_\_\_\_\_

Signature of Homeowner \_\_\_\_\_ Date \_\_\_\_\_

Optional - Watershed (Circle one)      Direct Drainage to Huron      Traver      Millers      Allen      Malletts      Honey      Swift Run      Fleming      Other

#### STAFF ONLY

Grading Permit # _____	Reviewer _____	Date _____
------------------------	----------------	------------