



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

IMPERVIOUS AREA WORKSHEET CHECKLIST ONE AND TWO FAMILY HOMES

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 63, Section 5:653 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, decks, 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 63 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 63) 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 63?

The amendments to Chapter 63 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

Stormwater Utility Rates and Credits:

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
Constructed Impervious Area		Removed Impervious Area		New Impervious Area

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.

$$\boxed{\text{sq ft}} \times \mathbf{0.08} = \boxed{\text{cubic feet}}$$

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:

<u>Treatment Measures</u>	<u>Conversion Formula</u>	<u>Storage Volume</u>
Rain Barrel	_____ gallons x 0.13369 =	_____ cubic feet
Rain Garden/Bioretenion	_____ ft (length) x _____ ft (width) x 0.75 ft (average depth) =	_____ cubic feet
Drywell (with pea stone)	_____ ft (length) x _____ ft (width) 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
Total Capacity***		_____ cubic feet

Links to information about these treatment measures are available at 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 or the Low Impact Development Manual for Michigan, www.semcog.org/LowImpactDevelopment.aspx.

Chapter 63, Section 5:653 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** Direct Drainage to Huron Traver Millers Allen Malletts Honey Swift Run Fleming Other
(Circle one)

STAFF ONLY

Grading Permit # _____ Reviewer _____ Date _____