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MAY 16 2013

WATER PROTECTION PROGRAM

CITY OF CARTHAGE

PHASE II

STORM WATER PERMIT

MAY 2013

Permittee Information:

Name: City of Carthage, Missouri

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General Information:

The Carthage MS4 drains into the Spring River watershed. Spring River flows east to west along the northern edge of Carthage. Carter Branch and City Branch are Spring River tributaries that flow generally south to north through the city.

Spring River is designated as an impaired water body under Section 303(d) of the federal Clean Water Act. The pollutants identified in Spring River are present many miles upstream of the Carthage MS4. Stormwater discharges from the Carthage MS4 do not significantly contribute pollutants into the river. At the present time, the Environmental Protection Agency (EPA) has not approved any Total Maximum Daily Loads (TMDL) to address pollutants discharged from the Carthage MS4 into Spring River.

MCM #1: Public Education and Outreach on Stormwater Impacts

4.2.1.1 Permit Requirements

Section 4.2.1.1 of the general MS4 permit requires the permittee to implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff. The permit requires the public education and outreach program to include:

- Identification of the target pollutant sources the permittee's public education program is designed to address;
- Identification of target audiences for the permittee's education program who are likely to have significant storm water impacts (including commercial, industrial, and institutional entities);
- Plan to inform individuals and households about the steps they can take to reduce storm water pollution;
- Plan to inform individuals and groups on how to become involved in the SWMP (with activities such as local stream and lake restoration activities);
- An outreach strategy, including the mechanisms (e.g., printed brochures, newspapers, media, workshops, etc.) that will be used to reach the target audiences and the number of people this strategy is expected to reach;
- Plan to evaluate the success of this minimum control measure.

4.2.1.1.1 Target Pollutant Sources

The City of Carthage developed its stormwater public education and outreach program in cooperation with other jurisdictions in the region. The target pollutant sources identified were:

- Construction activities
- Paint and household chemicals
- Oil, grease, antifreeze, and gasoline
- Trash, debris, and illegal dumping
- Snow removal

4.2.1.1.2 Target Audiences

The following target audiences were selected because improving their behavior with respect to the target pollutant sources would improve stormwater quality:

- Citizens
- Lawn Service Companies
- Developers and Home Builders
- Business Owners

4.2.1.1.3 Inform Public How to Reduce Stormwater Pollution

The public education program was designed to teach the target audiences how to recognize potential pollution sources and to offer options and alternatives for prevention and proper disposal. Emphasis is given to the economic importance and community benefits of pollution

prevention, proper waste disposal, and resource management activities.

4.2.1.1.4 Inform Public How to Become Involved in SWMP

Carthage provides instructions for participating in the Stormwater Management Plan (SWMP) in all materials distributed to the public.

4.2.1.1.5 Outreach Strategy

Carthage uses printed and web based media to reach target audiences multiple times. Repetition is important to increase awareness and modify behaviors. The city also partners with other governmental and non-governmental entities in the area to share information, resources, and programs.

4.2.1.1.6 Evaluation

Carthage will develop and distribute a questionnaire in Year 4 to determine the effectiveness of their educational programs and to suggest avenues for improvement.

Specific BMPs for each year of the permit are presented as follows:

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Issue Press Releases Regarding Local Stormwater Issues	X	X	X	X	X
Post Information on Website	X	X	X	X	X
Maintain a Library of Storm Water Educational Materials	X	X	X	X	X
Update Inventory of Educational Materials		X			
Distribute Educational Materials through Utility Bill Inserts			X		
Develop and Distribute Questionnaire To Test Public's Knowledge of Stormwater Issues				X	
Use results of Year 4 Evaluation to Enhance Educational Efforts					X

Carthage selected these BMPs based on EPA and American Society of Civil Engineers (ASCE) research which indicates they are likely to increase awareness and positively modify behaviors with regard to the MS4s target pollutants. Many of these have already proven to be effective methods of communicating with individuals in our community.

The rationale for these goals is that providing educational materials to the target audiences in a number of formats provides the best opportunity to inform the public and have a positive impact on water quality.

MCM #2: Public Involvement and Participation

4.2.2.1 Permit Requirements

Section 4.2.2.1 of the general MS4 permit requires the permittee to implement a public involvement/participation program that complies with State and local public notice requirements, and involves the public in the development and oversight of the SWMP policies and procedures. The permit requires the public involvement/participation program to include:

- Description of how the permittee has involved the public in the development and submittal of the permit application and SWMP;
- Identification of the target audiences, including the types of ethnic and economic groups engaged;
- Identification of the types of public involvement activities to be included in the public involvement/participation program with the following mandatory (where appropriate):
 - Citizen representatives on a storm water management panel
 - Public hearings
 - Working with citizen volunteers willing to educate others about the program
 - Volunteer monitoring or stream/beach clean-up activities
- Plan to actively involve public in development and implementation of the public involvement/participation program;
- Plan to evaluate the success of this minimum control measure.

4.2.2.1.1 Public Involvement in Development and Submittal

Carthage held a public meeting to discuss the SWMP and solicit public input. Comments from the meeting were posted for public review.

4.2.2.1.2 Target Audiences

The following target audiences were selected for the permittee's public involvement/participation program:

- Citizens
- Mass Media
- Local Elected Officials
- Local Government Agencies
- Business Leaders
- Youth

4.2.2.1.3 Public Involvement Activities

The City of Carthage MS4, in cooperation with the Jasper County Health Department, participates in a Clean Water Act Section 319 grant. Public involvement activities include educational demonstrations and seminars, outreach programs, and media campaigns. Stream Team members and other public volunteers monitor stream quality and provide debris clean-up during work days.

4.2.2.1.3 Public Involvement in Development and Implementation

The public is involved in development and implementation through periodic public meetings.

4.2.1.1.6 Evaluation

The success of this minimum control measure will be evaluated through the milestones of the 319 grant.

Specific BMPs for each year of the permit are presented as follows:

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Maintain Community Hotline	X	X	X	X	X
Hold Public Meetings		X		X	

Carthage selected these BMPs based on EPA and ASCE research which indicates they are likely to increase awareness and positively modify behaviors with regard to the MS4s target pollutants. Many of these have already proven to be effective methods of communicating with individuals in our community.

The rationale for these goals is that providing educational materials to the target audiences in a number of formats provides the best opportunity to inform the public and have a positive impact on water quality.

MCM #3: Illicit Discharge Detection and Elimination

4.2.3.1 Permit Requirements

Section 4.2.3.1 of the general MS4 permit requires the permittee to develop, implement and enforce a program to detect and eliminate illicit discharges (as defined in 10 CSR 20-6.200) into the permittee's small MS4. The program must include development and implementation of, at a minimum:

- A storm sewer system map showing the locations of all outfalls and the names and location of all waters of the State that receive discharges from those outfalls;
- An ordinance or other regulatory mechanism to effectively prohibit non-storm water discharges into the permittee's storm sewer system, with appropriate enforcement procedures and actions;
- A plan to detect and address non-storm water discharges, including illegal dumping and spills, to the permittee's system. The plan shall also address on-site sewage disposal systems that flow into the permittee's storm drainage system. The permittee's description shall address the following, at a minimum:
 - Procedures for locating priority areas
 - Procedures for tracing the source of an illicit discharge
 - Procedures for removing source of illicit discharge
 - Plan to ensure compliance
 - Plan to inform employees, businesses, and public of illegal discharge/disposal hazards
 - Plan to evaluate the success of this minimum control measure;

4.2.3.1.1 Map

Carthage used the following sources to develop a storm sewer system map showing the location of all outfalls and the names and location of all waters of the State that receive discharges from those outfalls:

- Storm Sewer Mapping
- Piping Schematic Review
- Aerial Photography
- Sewer Maintenance Records
- Public Complaints

Carthage uses proposed construction plans to locate new outfalls and update the maps.

4.2.3.1.2 Ordinances and Regulations

Existing Carthage ordinances and regulations prohibit non-stormwater discharges into the stormwater system. The ordinances and regulations are enforceable with appropriate procedures and consequential actions. A copy of pertinent ordinances/regulations is attached.

4.2.3.1.3 Detect/Address

Carthage uses visual inspection, dry weather field screening, and public complaints to detect illegal/illicit non-stormwater discharges into the stormwater system. Public works employees have been trained to recognize and report evidence of illicit discharges.

4.2.3.1.3.1 Priority Areas

Carthage uses previously developed system maps and field observation to identify priority areas with likelihood of illicit connections.

4.2.3.1.3.2 Locating Source

Carthage utilizes system and topographic maps to identify the surface area that contributes to the identified discharge location. Likely pollution sources are identified within the contributing area, and further field tests are used to identify the source location.

4.2.3.1.3.3 Removing Source

Carthage follows its illicit discharge ordinance to compel the removal of an identified illicit discharge.

4.2.3.1.3.4 Enforcement Procedures

The following enforcement actions are authorized in the Carthage illicit discharge ordinance and are used to ensure removal of the source of the illicit discharge detected:

- Discontinuance of Water Service
- Civil Penalties
- Issuance of Stop Work Orders
- Permit Denial for Non-Compliance

4.2.3.1.3.5 Inform Public

Carthage informs public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste using the following methods:

- Procedural Training for City Staff
- Distribute Literature
- Recycling Program for Household Hazardous Waste in conjunction with the City of Joplin
- Visual Inspection
- Storm Drain Stenciling
- Household Hazardous Waste Collection
- Illegal Dumping Hotline

Where applicable the information distributed through these means coordinate with the information distributed in the Public Education minimum control measure (e.g., consistent/coordinated messages in literature).

4.2.3.1.3.6 Evaluation

The success of the described program is evaluated annually by analyzing the number and location of illicit connections discovered and eliminated.

4.2.3.1.4 Non-stormwater Discharges

Carthage has not identified any of the following categories of non-stormwater discharges or flows (i.e. illicit discharges) as significant contributors of pollutants to their small MS4: landscape irrigation, rising ground waters, uncontaminated ground water infiltration (as defined in 10 CSR 20-6.200), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, water from crawl space pumps, footing drains, lawn watering, flows from riparian habitats and wetlands, and street wash water (discharges or flows from emergency fire fighting activities are excluded from the effective prohibition against non-stormwater and need only be addressed where they are significant sources of pollutants to waters of the state.)

4.2.3.1.5 Incidental Non-stormwater Discharges

Carthage's illicit discharge ordinance includes a list of occasional or incidental non-stormwater discharges (e.g. non-commercial or charity car washes, etc.) that will not be addressed as illicit discharges because they are not reasonably significant sources of pollutants to the MS4. Should these occasional or incidental non-stormwater discharges be identified as significant sources of pollutants in the future, those entities responsible for discharging will be prohibited or conditions will be placed on them so as to minimize their discharge of pollutants.

4.2.3.1.6 Industries and Commercial Enterprises

? NA

Specific Best Management Practices (BMPs) for each year of the permit are presented as follows:

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Dry Weather Visual Inspection of Outfalls	X	X	X	X	X

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Summarize & report findings per proactive & complaint investigations.

Carthage selected these BMPs because they have been effective methods of identifying and eliminating illicit discharges in the past.

The rationale for these goals is that they target locations with a high potential of creating illicit discharges. Inspections provide the opportunity to educate the public and provide guidance for mitigation to have a positive impact on water quality.

MCM #4: Construction Site Stormwater Runoff Control

4.2.4.1 Permit Requirements

Section 4.2.4.1 of the general MS4 permit requires the permittee to develop, implement and enforce a program to reduce pollutants in any stormwater runoff from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activity disturbing less than one acre shall be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The program must include development and implementation of, at a minimum:

- An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State or local law;
- Requirements for construction site operators to control construction-site waste that may cause adverse impacts to water quality;
- Procedures for site plan review which incorporate consideration of potential water quality impacts;
- Procedures for receipt and consideration of information submitted by the public; and
- Procedures for site inspection and enforcement of control measures;
- Procedures for enforcement
- Plan to evaluate the success of this minimum control measure.

4.2.4.1.1 Ordinances and Regulations

Carthage uses and enforces a program to reduce pollutants in stormwater runoff from construction activities that result in disturbance of greater than or equal to one acre and from construction activities that disturb an area less than one acre if the site is part of a larger common plan of development or sale.

4.2.4.1.1.1 Best Management Practices (BMPs)

Carthage requires construction site operators to implement appropriate erosion and sediment control BMPs. Carthage has adopted Model BMPs for land disturbance in their ordinance which includes construction specifications and design standards. The ordinance outlines the requirements for designers and contractors before, during and after the construction activities. The ordinance provides enforcement measures for those designers and contractors who do not follow the ordinance.

The city provides the following documents to designers and contractors to assist in compliance with the ordinance requirements:

- Design Methodologies
- BMP Fact Sheets
- Sample Plans
- Construction Specifications
- Standard Details
- Ordinance

4.2.4.1.1.2 Sanctions

The Carthage ordinance includes sanctions to ensure compliance with the required erosion and sediment controls. ?

4.2.4.1.1.3 Ordinance

A copy of the land disturbance ordinance is attached.

4.2.4.1.2 Waste Control

Carthage requires construction site operators to control wastes that may cause adverse impacts to water quality, including:

- Discarded Building Materials
- Concrete Truck Washout
- Chemicals
- Litter
- Sanitary Waste

4.2.4.1.3 Site Plan Review

Carthage conducts pre-construction site plan reviews and considers the potential water quality impact of construction activities.

4.2.4.1.4 Receipt & Consideration of Public Comment

Carthage accepts public comments and information through the Public Works Department.

4.2.4.1.5 Site Inspection

The Carthage ordinance outlines procedures for site inspection and enforcement of site runoff requirements. Sites will be inspected using a priority rating system. The site with the most potential risk to the community will be top on the priority list.

4.2.4.1.6 Compliance Assurance

The Carthage ordinance ensures compliance through its enforcement section detailing the following sanctions for non-compliance:

- Non-Monetary Penalties
- Fines
- Permit Denial for Non-Compliance

4.2.4.1.7 Evaluation

The success of this minimum control measure will be measured by documenting compliance and non-compliance during site inspections.

Specific BMPs for each year of the permit are presented as follows:

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Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Review Construction Plans	X	X	X	X	X
Update Stormwater Maps as Appropriate	X	X	X	X	X
Inspect Construction Sites	X	X	X	X	X
Enforce Ordinances/Regulations	X	X	X	X	X
Update Construction BMPs with New Methodologies				X	

Carthage selected these BMPs because they provide oversight in all aspects of construction from planning to completion.

The rationale for these goals is that educating stakeholders, providing review processes, suggesting alternative methods, monitoring sites, and enforcing ordinances improves the likelihood that construction projects maintain or improve water quality.

MCM #5: Post-Construction Stormwater Management in New Development and Redevelopment

4.2.5.1 Permit Requirement

Section 4.2.5.1 of the general MS4 permit requires the permittee to develop, implement and enforce a program to address the quality of long-term stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that will prevent or minimize water quality impacts by reasonably mimicking pre-construction runoff conditions on all affected new development projects and by effectively utilizing water quality strategies and technologies on all affected redevelopment projects, to the maximum extent practicable. Pre-design site characteristics must be considered to provide effective water quality treatment. The permit requires that this program include the following:

- Strategy to minimize water quality impacts, by reasonably mimicking pre-construction runoff conditions in affected new development and incorporating water quality protection in affected redevelopment projects to the maximum extent practicable, and include a combination of structural and/or non-structural BMPs appropriate for the permittee's community;
- Ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law;
- Plan to ensure adequate long-term operation and maintenance of BMPs;
- Specific priority areas
- Non-structural BMPs, including:
 - Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation;
 - Policies or ordinances that encourage infill development in higher density urban areas and areas with existing storm sewer infrastructure;
 - Education programs for developers and the public about project designs that minimize water quality impacts; and
 - Other measures such as minimization of the percentage of impervious area after development, use of measures to minimize directly connected impervious areas, site designs that provide for integration of a variety of infiltration practices, and source control measures often thought of as good housekeeping, preventive maintenance and spill prevention.
- Structural BMPs, including:
 - Practices that provide infiltration, evapotranspiration or re-use
 - Redevelopment practices

- Plan to evaluate the success of this minimum measure.

4.2.5.1.1 Strategy to Minimize Impacts

Carthage requires a combination of structural and/or non-structural BMPs that are appropriate for the site and provide for construction runoff to reasonably mimic pre-construction runoff conditions.

4.2.5.1.2 Ordinance

Carthage uses ordinances and regulations to control post-construction runoff from new development and redevelopment projects to the extent allowable under State and Local law. A copy of the ordinance is attached.

4.2.5.1.3 Long-Term Operation & Maintenance

Carthage implemented options to ensure the long-term operation and maintenance (O&M) of their selected BMPs. These options identify future O&M responsibilities.

4.2.5.1.4 Priority Areas

Carthage ordinances regulate stormwater runoff from new development and redevelopment projects to minimize adverse water quality impacts and attempt to maintain pre-development conditions. There are no areas identified as priority areas.

mimic quality?

4.2.5.1.5 Non-Structural BMPs

4.2.5.1.5.1 Policies & Ordinances

Carthage uses site based local controls to minimize impervious surfaces and minimize disturbance of soil and vegetation.

4.2.5.1.5.2 Infill Development

? N/A

4.2.5.1.5.3 Education

BMP educational materials are readily available for developers and the public to inform them about project designs that minimize water quality impacts.

4.2.5.1.5.4 Other Non-Structural Measures

? N/A

4.2.5.1.6 Structural BMPs

4.2.5.1.6.1 Infiltration/Evapotranspiration

Carthage uses detention/retention structures and filtration practices to reduce sediment runoff and to provide infiltration and evapotranspiration of stormwater.

4.2.5.1.6.2 Redevelopment Practices

? Redevelopment projects are encouraged to utilize structural BMPs that will reduce runoff, require little long-term maintenance, and improve water quality.

→ required per permit

4.2.5.1.7 Evaluation

The success of this minimum control measure will be measured by evaluating and documenting the effectiveness the selected BMPs on reducing the rate of runoff and improving water quality.

Specific BMPs for each year of the permit are presented as follows:

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Inspection and Maintenance of Long-Term BMPs	X	X	X	X	X
Detention/Retention	X	X	X	X	X
Filtration Practices	X	X	X	X	X

Plan review/approval? Up front check list?

Carthage selected these BMPs because they provide cost effective options that have proven successful for the MS4 in the past.

The rationale for these goals is that a combination of ordinances, cost effective BMP options, inspection, and BMP maintenance reduce pollutants and maintain or improve water quality.

MCM #6: Pollution Prevention/Good Housekeeping for Municipal Operations

4.2.6.1 Permit Requirement.

Section 4.2.6.1 of the general MS4 permit requires the permittee to develop and implement an operations and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. The program is required to provide the following information:

- List of all municipal operations that are impacted by the operation and maintenance program;
- Maintenance BMPs, maintenance schedules and long term inspection procedures for controls to reduce floatables and other pollutants;
- Controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, waste transfer stations, fleet or maintenance shops with outdoor storage areas and salt/sand storage locations and snow disposal areas the permittee operates;
- Controls described in Sections 4.1.5 through 4.1.8 of the general MS4 permit;
- Procedures for the proper disposal of waste removed from the permittee's MS4 and area of jurisdiction, including dredged materials, accumulated sediments, floatables and other debris;
- Procedures to ensure that new flood management projects are assessed for incorporation of additional water quality protection devices or practices; and
- Procedures to train employees to prevent and reduce stormwater pollution from municipal activities in coordination with public education and illicit discharge minimum controls.
- Plan to evaluate the success of this minimum measure.

4.2.6.1.1 Municipal Operations Impacted

The following City activities are included in the operation and maintenance program:

- Catch Basin Cleaning
- Street Sweeping
- Recycling Program
- Maintenance Schedule
- Maintenance Activities
- Long-Term Inspection Procedures
- Pesticide Use
- Proper Disposal of Waste from Storm Sewer System
- Employee Training

4.2.6.1.2 Maintenance BMPs/Schedules and Long-Term Inspection

The following activities are implemented to reduce the floatables and other pollutants in the MS4:

- Maintenance Schedule
- Maintenance Activities

- Long-Term Inspection Procedures

4.2.6.1.3 Controls to Reduce/Eliminate Runoff from Municipal Facilities

Carthage intends to reduce or eliminate the discharged pollutants from the following locations:

- Streets
- Roads
- Highways
- Municipal Parking Lots
- Maintenance and Storage Yards
- Salt/Sand Storage Locations
- Snow Disposal Areas

The following controls and/or programs are in place to reduce or eliminate the discharge of pollutants from facilities owned by the City of Carthage:

- Catch Basin Cleaning
- Street Sweeping
- Recycling Program
- Minimize Pesticides Used
- Proper Disposal of Storm Sewer System Waste
- Employee Training

4.2.6.1.4 Controls for Section 4.1.5 through 4.1.8 Pollutants

4.1.5 Solid Waste – Solid waste from municipal operations is disposed of in accordance with state and federal regulations.

4.1.6 Fueling Facilities – NA

4.1.7 Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) substances – Substances regulated under RCRA and CERCLA are managed according to the provisions of those acts.

4.1.8 Paint, solvents, petroleum products and petroleum waste products (except fuels) – The city stores these products so they are not exposed to stormwater. Procedures are in place to reduce the likelihood of spills and to contain/clean-up spills to prevent pollutants from entering stormwater and groundwater.

4.2.6.1.5 Proper Disposal of Removed Waste

Dredged material, accumulated sediments, floatables and other debris removed from the Carthage MS4 are disposed of in compliance with state and federal regulations.

4.2.6.1.6 Flood Management Projects

Carthage periodically reviews their current flood management regulations to ensure that new projects are assessed for water quality impacts and existing projects are considered for additional water quality protection devices or practices.

4.2.6.1.7 Employee Training

Carthage uses educational materials from EPA, State and other organizations, to train employees how to plan and conduct their work in a manner that will prevent or reduce pollutants from

entering stormwater. These activities are coordinated with the outreach programs developed for the public information and illicit discharge minimum control measures so that a consistent message is presented throughout Carthage's program. The employee education program is aimed at the following activities:

- Park and Open Space Maintenance
- Fleet and Building Maintenance
- New Construction and Land Disturbances
- Storm Water System Maintenance
- Street Maintenance
- Snow Removal Operations

4.2.6.1.8 Evaluation

Carthage evaluates the success of the pollution prevention/good housekeeping minimum control measure by regularly inspecting work areas and by observing maintenance activities in progress. Training and re-training is provided as warranted.

Specific BMPs for each year of the permit are presented as follows:

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14
11*

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Employee Training	X	X	X	X	X
Storm Drain Debris Removal after Each Major Storm Event	X	X	X	X	X
Facilities/Equipment Inspection, Maintenance, and Upgrades	X	X	X	X	X

Carthage selected these BMPs because they have proven successful in the past to minimize negative water quality impact from municipal activities.

The rationale for these goals is that a combination of training and regular maintenance will reduce discharge of pollutants and will maintain or improve water quality.

Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 6 - BUILDINGS AND BUILDING REGULATIONS >> **ARTICLE XII. - SEDIMENT AND EROSION CONTROL MEASURES ON CONSTRUCTION SITES >>**

ARTICLE XII. - SEDIMENT AND EROSION CONTROL MEASURES ON CONSTRUCTION SITES ¹³⁵¹

Sec. 6-461. - Purpose.

Sec. 6-462. - Definitions.

Sec. 6-463. - Permits.

Sec. 6-464. - Review

Sec. 6-465. - Sediment and erosion control plan.

Sec. 6-466. - Design requirements.

Sec. 6-467. - Pre-construction meeting.

Sec. 6-468. - Inspection.

Sec. 6-469. - Enforcement.

Sec. 6-470. - Penalties.

Secs. 6-471—6-490. - Reserved.

Sec. 6-461. - Purpose.

The purpose of this article is to safeguard persons, protect property, and prevent damage to the environment in the city while meeting EPA requirements for developing an effective SWPPP. This article will promote the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity that disturbs or breaks the topsoil or results in the movement of earth on land in the city.

(Ord. No. 04-50, § 1, 12-14-2004)

Sec. 6-462. - Definitions.

BMPs best management practices used for reducing sediment in runoff waters or to minimize erosion due to wind or water.

Certified contractor or inspector: A person who has received training and is licensed by (state or local environmental agency), or is a CPESC, to inspect and maintain sediment and erosion control practices.

Clearing: Any activity that removes existing vegetative surface cover.

CPESC: Certified professional in erosion and sediment control.

CWA: Clean Water Act.

Drainage way: Any channel that conveys surface runoff throughout the site.

EPA: Environmental Protection Agency.

Erosion control: A measure that minimizes the removal of soil particles due to wind or water.

Grading: Excavation of fill material, including the resulting conditions thereof.

NOI: Notice of intent.

NOT: Notice of termination.

NPDES: National Pollutant Discharge Elimination System.

Phasing: Removing existing vegetation from a parcel of land in distinct phases, with the stabilization of each phase completed before clearing the next.

Project: An undertaking by the applicant as described in the proposed plan, including (but not limited to) all phases of a proposed subdivision, development of multiple lots or parcels, building of a roadway, or other earth disturbing activities.

Sediment control: Measures that reduce suspended particles found in runoff waters.

Sediment and erosion control plans: A set of plans prepared by or under the direction of a CPESC, licensed engineer, or other Missouri approved professional. The plans indicate specific measures and sequencing to be used for reducing sediment in runoff waters and minimizing erosion on a construction site during pre and post construction activities.

Site: A parcel of land or a contiguous combination thereof, where grading work is performed as a single unified operation.

Site development permit: A permit issued by the municipality for the construction or alteration of ground improvements and structures to reduce sediment in runoff waters, controlling runoff, and grading.

Stabilization: Practices that minimize erosion of exposed soil due to wind and water.

Start of construction: The first land-disturbing activity including land preparation such as grubbing, clearing, grading and filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings.

SWPPP: Storm Water Pollution Prevention Plan.

Watercourse: Any body of water, including, but not limited to lakes, ponds, rivers, streams, and bodies of water delineated by the City of Carthage.

Waterway: A channel that directs surface runoff to a watercourse or to the public storm drain.

(Ord. No. 04-50, § II, 12-14-2004)

Sec. 6-463. - Permits.

- (a) In order to ensure EPA's Phase I and Phase II regulations are met, and to comply with sections 25-59 and 25-60 of the Code of Carthage, no person, corporation firm, or entity shall commence grading and earth movement activities without first obtaining a site development (land use) permit from the city.
- (b)

No person, corporation, firm, or entity shall be granted a site development permit for land-disturbing activity that require the uncovering of greater than or equal to one (1) acre without the approval of a sediment and erosion control plan by the public work department.

- (c) No site development permit is required for the following activities:
- (1) Any emergency activity that is immediately necessary for the protection of life, property, or natural resources.
 - (2) Cemetery graves.
 - (3) Refuse disposal sites controlled by other regulations.
 - (4) Any activity where the total volume of material disturbed, stored, disposed of or used as fill does not exceed five (5) cubic yards or the area disturbed does not exceed five hundred (500) square feet provided it does not obstruct a watercourse, and is not located in a floodplain.
- (d) A written application from the owner of the site, or his/her authorized representative, in the form prescribed by the public works department, shall be required for each permit. Plans and specifications shall be prepared or approved and signed by a civil engineer, surveyor, architect, or landscape architect. The public works director may waive the preparation or approval and signature by the civil engineer, surveyor, architect, or landscape architect when it is self-evident that the work is simple, clearly shown, and entails no hazard or nuisance potential to adjacent property or watercourse, and does not include the placement of fill upon which a structure may be erected.
- (e) Each application shall bear the name(s) and address(es) of the owner or developer of the site, and a statement that
- (1) The movement of earth shall be in accordance with the sediment and erosion control plan.
 - (2) A certified contractor, inspector, or CPESC shall be on site on all days when construction or grading activity takes place.
- (f) For areas of disturbance equal to or greater than one (1) acre, applicant is also required to submit a land disturbance application to State of Missouri Department of Natural Resources (DNR).
- (g) The applicant may be required to file with the city a faithful performance bond, letter of credit, or other improvement security in an amount deemed sufficient by public works department to cover all costs of improvements, landscaping, maintenance of improvements for such period as specified by the city. The amount specified will also cover all expenditures associated with:
- (1) Engineering and inspection.
 - (2) Repair of improvements installed on site.
 - (3) Rehabilitation of disturbed lands as identified by the city as being in violation of the CWA and NPDES permit regulations.
- (h) NPDES requirements will remain in force until NOT requirements are fulfilled and approved by the public works department.
- (i) Permits issued under this ordinance shall be valid for the period during which the proposed land disturbing or filling activities and soil storage takes place or are scheduled to take place, whichever is shorter, but in no event shall such a permit be valid for more than one (1) year. The permittee shall commence permitted activities within one hundred eighty (180) days of the scheduled commencement date for grading or the permittee shall resubmit all required application forms, maps, plans, and schedules to the public works department, except where an item to be resubmitted is waived by the issuing authority.
- (j)

Permit fees for areas of one (1) acre and not part of a platted subdivision, shall be twenty-five dollars (\$25.00). For areas greater than one (1) acre and not part of a platted subdivision, the fee shall be twenty-five dollars (\$25.00) for the first acre and five dollars (\$5.00) per each acre thereafter. For lots within a platted subdivision, a ten dollars (\$10.00) fee per lot with a minimum of one hundred dollars (\$100.00) per phase.

(Ord. No. 04-50, § III, 12-14-2004)

Sec. 6-464. - Review

and approval.

- (a) The public works department will review each application for a site development permit to determine its conformance with the provisions of this regulation. Within thirty (30) days after receiving an application, the public works department shall, in writing:
 - (1) Approve the permit application; or
 - (2) Approve the permit application subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation, and issue the permit subject to these conditions; or
 - (3) Disapprove the permit application, indicating the reason(s) and procedure for submitting a revised application and/or submission.
- (b) If the public works department determines that the plan cannot be reviewed within thirty (30) working days, the applicant shall be notified and they shall mutually agree upon the time for completion of the plan review. If the applicant wishes to have the plan approved prior to thirty (30) working days or at a time sooner than the public works department can complete the review, the applicant shall agree to pay for an outside review that will be performed by a qualified person selected by the public works department.
- (c) Failure of the public works department to act on an original or revised application within thirty (30) days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and the public works department.
- (d) If the applicant amends an approved plan before construction activities commence, the amended plan shall be submitted for review by the public works department. No work shall commence pursuant to the amended plan until the amended plan is approved by the public works department.

(Ord. No. 04-50, § IV, 12-14-2004)

Sec. 6-465. - Sediment and erosion control plan.

- (a) The sediment and erosion control plan shall include, but not be limited to, the following:
 - (1) Maps identifying:
 - a. The site vicinity and adjacent properties within five hundred (500) feet.
 - b. The soils, vegetative cover, and other resources protected under this code.
 - c. The site boundary survey of the site on which the work is to be performed.
 - (2) Drawings that should typically consist of the following:
 - a. One (1) set of pre-construction drawings that illustrate at least the following:
 - Existing topography at contour intervals of one (1) foot
 - Existing drainage basins
 - Historic runoff patterns

- Location and nature of existing problems (e.g., wetlands)
 - General location of where structural BMP's are to be installed
 - BMP specifications, quantity
 - Construction time schedule
 - Inspection and maintenance requirements
- b. One (1) set of during construction drawings that illustrate at least the following:
- Proposed topography at contour intervals of one (1) foot
 - Proposed drainage basins
 - Proposed runoff patterns
 - Location and nature of potential problems
 - General location of where structural BMP's are to be installed
 - General locations of where nonstructural BMP's are to be installed while construction activities occur
 - BMP specifications and quantity
 - Construction time schedule
 - Inspection and maintenance requirements
- c. If agreed upon by the public works department, the pre-construction and during construction plans can be combined into one (1) set of drawings. Items found above shall be included in the drawings. However, topographic features of combined drawings shall consist of existing contours printed in faded dash lines and new contours in solid lines at intervals specified by the public works department.
- d. One (1) set of post construction drawings that illustrate at least the following:
- Proposed topography at contour intervals of one (1) foot
 - Proposed drainage basins
 - Proposed runoff patterns
 - Disturbed lands where seeding, mulching, use of rolled erosion control products (RECPs) and other nonstructural erosion control methods (e.g., riprap) are to be installed
 - Detailed information on erosion control measures (including vegetation establishment specifications) and quantity
 - Requirements on removal of structural sediment control measures
 - Inspection and maintenance requirements
- All drawings shall have a maximum scale of one (1) inch equal to one hundred (100) feet and consist of one (1) or more sheets of paper no smaller than eleven (11) inches by seventeen (17) inches and no larger than twenty-four-inches by thirty-six-inches.
- (3) Depending upon the complexity of the project, the drafting of intermediate plans will be required at the close of each season as specified by the public works department.
- (b) The public works department reserves the right to require additional updates, deletions, and other modifications to the plans as may be needed.

(Ord. No. 04-50, § V, 12-14-2004)

Sec. 6-466. - Design requirements.

- (a)

Grading, sediment control practices, erosion control practices, and waterway crossings shall meet at least the design criteria set forth in the most recent version of city's sediment and erosion control manual. However, the public works department encourages use of innovative, cost effective, and new BMP methods, but may require justification and approval before their implementation.

- (b) Clearing and grading of natural resources, such as forests and wetlands, shall not be permitted, except when in compliance with all other chapters of this Code. Clearing techniques that retain natural vegetation and drainage patterns shall be used to the satisfaction of the public works department.
- (c) Clearing of existing vegetation, except that necessary to install structural BMP's, shall not begin until all structural BMP's illustrated in the pre-construction drawings have been installed by the contractor and approved by the inspector.
- (d) Structural BMPs illustrated in the during construction drawings shall be installed in a timely manner, inspected and maintained.
 - (1) Sediment containment systems (e.g., sediment basins) shall be designed in a manner that allows adaptation to provide long term stormwater management, if required by public works department.
- (e) Nonstructural BMPs to control erosion illustrated in the during and post construction drawings will be implemented during construction activities and as is feasible and as required by the public works department. Where applicable, the following minimum criteria shall be met:
 - (1) Phasing the removal of existing vegetation shall be required on all sites disturbing greater than twenty (20) acres, with the size of each phase to be established at plan review and as approved by public works department.
 - (2) Soil stabilization against erosion shall be completed within seven (7) working days of clearing or inactivity in construction.
 - (3) Soil stockpiles must be stabilized against erosion with a frequency (e.g., daily, weekly, etc.) directed by public works department.
 - (4) All exposed ground of a site must be stabilized against erosion at the close of the construction season or when construction activities will cease for more than thirty (30) days.
 - (5) Techniques shall be employed while construction activities occur to minimize the development of wind borne particles.
 - (6) Techniques that divert upland runoff past disturbed slopes shall be employed.
- (f) Waterway and watercourse protection requirements shall include:
 - (1) A temporary stream crossing installed and approved by the Missouri Department of Natural Resources if a wet watercourse will be crossed regularly during construction.
 - (2) Stabilization of the watercourse channel before, during, and after any in-channel work.
- (g) Construction site access requirements shall include measures required by the public works department in order to ensure that minimal amounts of sediment are not tracked onto public streets by construction vehicles or washed into storm drains.

(Ord. No. 04-50, § VI, 12-14-2004)

Sec. 6-467. - Pre-construction meeting.

- (a) At least five (5) working days before construction activities begin, a pre-construction meeting shall be held with the applicant and his/her contractors and representatives from the public works department. As a minimum at the meeting, the following will be addressed:

- (1) A decision as to whether inspection of BMPs proposed to be used on the construction site throughout the entire development process shall be completed by the services of an applicant's inspector or the public works department's designated agent.
 - a. If an applicant's inspector services are to be used, such services must be approved by, and be accountable to, the public works department.
 - b. If the inspector services of a public works department designated agent are to be used, such services shall be billed to the applicant by the public works department.
- (b) The public works department shall clearly explain to contractors their obligation to protect the environment while construction activities occur. Specific topics to be discussed shall include (but not be limited to) the following:
 - (1) Adherence to, and changes of, the sediment and erosion control plans.
 - (2) Frequency of inspections.
 - (3) Record keeping and accountability issues.
 - (4) Potential penalties for repeated violations and noncompliance issues.
 - (5) If applicable, winter shutdown provisions.
 - (6) Posting the permit at the site.
 - (7) Keeping a set of plans at the site.

(Ord. No. 04-50, § VII, 12-14-2004)

Sec. 6-468. - Inspection.

- (a) Inspection of the construction site shall occur to ensure BMPs are implemented and maintained in a timely manner as required and illustrated in the pre-, during, and post-construction drawings or their approved modifications. Modifications, additions, and omission of BMPs required making a plan more effective is permitted. However, when BMPs are not installed as illustrated on the pre-, during, and post construction drawings or their modifications, the inspector must provide written justification in an inspection report as to why omissions and/or changes were allowed to occur.
- (b) Inspectors shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the sediment and erosion control plan as approved.
 - (1) Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the public works department shall be maintained at the site during the progress of the work.
 - (2) Inspections shall occur at least once each week and within twenty-four (24) hours after a climatic event results in runoff to evaluate the overall effectiveness of a control plan and to assess the need for possible additional or less control measures.
 - (3) All inspections shall be documented in written form and submitted to the public works department at the time interval specified in the approved permit. Inspection reports include the following:
 - a. When compliance issues found in the plans are met.
 - b. When noncompliance issues with the plans are found and what (and when) mitigation measures were implemented.
 - c. When CWA or other environmental violation issues are found. Detailed information of the violation is to be given accompanied by descriptions of what was done to correct the problem.

Copies of all inspection reports are to be kept and maintained in a logbook at the construction site. The logbook is to be retained by the contractor and the public works department for three (3) years after construction activities cease.

- (4) Permittees shall notify the public works department at least two (2) working days before the following:
- a. Start of construction as signified by submittal of a NOI.
 - b. Completion of site clearing.
 - c. Completion of rough grading.
 - d. Completion of final grading.
 - e. Closings of the project site for any reason including the end of a construction season.
 - f. Completion of final landscaping and submittal of a NOT.
- (c) The public works department or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections and to review the logbook to ensure the validity of the reports filed under subsection (b)(3).

(Ord. No. 04-50, § VIII, 12-14-2004)

Sec. 6-469. - Enforcement.

- (a) *Stop-work order; revocation of permit.*
- (1) If the plan approved by the public works department is not complied with or the time schedule is not met, the public works department may issue a notice to stop work on the project. Within the time period specified in the notice to stop work, the work specified in the approved plan must be completed, and, if necessary, any unauthorized deviations from the approved plan must be corrected, abated, removed or repaired. If the project is not in compliance with the approved plan within time specified in the notice, the public works department shall issue a stop work order. Work shall not resume on the project until the public works department approves a completion and/or correction plan.
 - (2) If deemed necessary, the public works department may revoke the site development permit.
- (b) *Violation and penalties.*
- (1) No person shall construct, enlarge, alter, repair, or maintain any grading, excavation, or fill, or cause the same to be done, contrary to or in violation of any terms of this article. Any person violating any of the provisions of this article shall be deemed guilty of a misdemeanor and each day during which any violation of any of the provisions of this article is committed, continued, or permitted, shall constitute a separate offense.
 - (2) Upon conviction of any such violation, such person, partnership, or corporation shall be punished by a fine as specified in section 1-12 of the Code of Carthage.

(Ord. No. 04-50, § IX, 12-14-2004)

Sec. 6-470. - Penalties.

- (a) Certain persons are required to pay certain fees established by the public works department for work done inside the City of Carthage.
- (b) Persons, companies, businesses or corporations who do not pay the required fee or obtain the required permit through the public works department will be subject to the following penalties:
- (1) First offense, a fine of \$25.00 plus cost.
 - (2)

- Second offense, a fine of \$100.00 plus cost.
- (3) Third offense, a fine of \$250.00 plus cost.
 - (4) Fourth and subsequent offense, a fine of no less than two hundred fifty dollars (\$250.00) and no more than five hundred dollars (\$500.00) and a revocation of contractors and/or business license for one (1) year.
 - (5) If the violator does not have a contractors and/or business license their ability to apply for a contractors and/or business license will be suspended for one (1) year.

(Ord. No. 08-41, § 1, 9-11-08)

Editor's note—

Fee schedules for permits pertaining to the above-listed penalties are not listed herein, however can be found on record at the city public works department.

Secs. 6-471—6-490. - Reserved.

FOOTNOTE(S):

⁽³⁵⁾ ***Editor's note—*** Ord. No. 04-50, §§ I—IX, adopted Dec. 14, 2004 did not specify manner of codification, hence; inclusion of these provisions as Art. IX, §§ 6-461—6-469 was at the discretion of the editor. ([Back](#))

**Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 17 - PLANNING AND DEVELOPMENT >>
ARTICLE VI. - FLOODPLAIN MANAGEMENT ORDINANCE >>**

ARTICLE VI. - FLOODPLAIN MANAGEMENT ORDINANCE ^[62]

DIVISION 1. - STATUTORY AUTHORIZATION, FINDINGS OF FACT, AND PURPOSES

DIVISION 2. - GENERAL PROVISIONS

DIVISION 3. - ADMINISTRATION

DIVISION 4. - PROVISIONS FOR FLOOD HAZARD REDUCTION

DIVISION 5. - FLOODPLAIN MANAGEMENT VARIANCE PROCEDURES

DIVISION 6. - AMENDMENTS

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DIVISION 8. - PENALTIES FOR VIOLATION

FOOTNOTE(S):

⁽⁶²⁾ *Editor's note*— Ord. No. 04-39, Arts. 1—7, adopted Aug. 10, 2004 did not specify manner of codification, hence; inclusion of these provisions as Art. VI, §§ 17-101—17-103, 17-121—17-127, 17-141—17-144, 17-161—17-165, 17-171—17-176, 17-191, 17-211 was at the discretion of the editor. ([Back](#))

**Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 17 - PLANNING AND DEVELOPMENT >>
ARTICLE VI. - FLOODPLAIN MANAGEMENT ORDINANCE >> DIVISION 1. - STATUTORY AUTHORIZATION,
 FINDINGS OF FACT, AND PURPOSES >>**

DIVISION 1. - STATUTORY AUTHORIZATION, FINDINGS OF FACT, AND PURPOSES

Sec. 17-101. - Statutory authorization.

Sec. 17-102. - Findings of fact.

Sec. 17-103. - Statement of purpose.

Secs. 17-104—17-120. - Reserved.

Sec. 17-101. - Statutory authorization.

The Legislature of the State of Missouri has in RSMo 89.020 delegated the responsibility to local governmental units to adopt floodplain management regulations designed to protect the health, safety, and general welfare. Therefore, the City Council of City of Carthage, Missouri ordains as follows.

(Ord. No. 04-39, Art. 1, § A, 8-10-2004)

Sec. 17-102. - Findings of fact.

1. *Flood losses resulting from periodic inundation.* The special flood hazard areas of the City of Carthage, Missouri are subject to inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base; all of which adversely affect the public health, safety and general welfare.
2. *General causes of the flood losses.* These flood losses are caused by (1) the cumulative effect of development in any delineated floodplain causing increases in flood heights and velocities;

and (2) the occupancy of flood hazard areas by uses vulnerable to floods, hazardous to others, inadequately elevated, or otherwise unprotected from flood damages.

3. *Methods used to analyze flood hazards.* The flood insurance study (FIS) that is the basis of this article uses a standard engineering method of analyzing flood hazards which consist of a series of interrelated steps.
 - a. Selection of a base flood that is based upon engineering calculations which permit a consideration of such flood factors as its expected frequency of occurrence, the area inundated, and the depth of inundation. The base flood selected for this article is representative of large floods which are characteristic of what can be expected to occur on the particular streams subject to this article. It is in the general order of a flood which could be expected to have a one (1) percent chance of occurrence in any one (1) year as delineated on the Federal Insurance Administrator's FIS, and illustrative materials for Jasper County dated November 2, 2012 as amended, and any future revisions thereto.
 - b. Calculation of water surface profiles are based on a standard hydraulic engineering analysis of the capacity of the stream channel and over bank areas to convey the regulatory flood.
 - c. Computation of a floodway required to convey this flood without increasing flood heights more than one (1) foot at any point.
 - d. Delineation of floodway encroachment lines within which no development is permitted that would cause any increase in flood height.
 - e. Delineation of flood fringe, i.e., that area outside the floodway encroachment lines, but still subject to inundation by the base flood.

(Ord. No. 04-39, Art. 1, § B, 8-10-2004; Ord. No. 06-13, § 1, 2-28-2006; Ord. No. 07-12, § 1, 3-13-2006; Ord. No. 12-35, § 1, 8-28-2012)

Sec. 17-103. - Statement of purpose.

It is the purpose of this article to promote the public health, safety, and general welfare; to minimize those losses described in section 17-102(1); to establish or maintain the community's eligibility for participation in the National Flood Insurance Program (NFIP) as defined in 44 Code of Federal Regulations (CFR) 59.22(a)(3); and to meet the requirements of 44 CFR 60.3(d) by applying the provisions of this article to:

1. Restrict or prohibit uses that are dangerous to health, safety, or property in times of flooding or cause undue increases in flood heights or velocities;
2. Require uses vulnerable to floods, including public facilities that serve such uses, be provided with flood protection at the time of initial construction; and
3. Protect individuals from buying lands that are unsuited for the intended development purposes due to the flood hazard.

(Ord. No. 04-39, Art. 1, § C, 8-10-2004)

Secs. 17-104—17-120. - Reserved.

Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 17 - PLANNING AND DEVELOPMENT >> ARTICLE VI. - FLOODPLAIN MANAGEMENT ORDINANCE >> DIVISION 2. - GENERAL PROVISIONS >>

DIVISION 2. - GENERAL PROVISIONS

Sec. 17-121. - Lands to which article applies.

Sec. 17-122. - Floodplain administrator.

Sec. 17-123. - Compliance.

Sec. 17-124. - Abrogation and greater restrictions.

Sec. 17-125. - Interpretation.

Sec. 17-126. - Warning and disclaimer of liability.

Sec. 17-127. - Severability.

Secs. 17-128—17-140. - Reserved.

Sec. 17-121. - Lands to which article applies.

This article shall apply to all lands within the jurisdiction of the City of Carthage, Missouri identified as numbered and unnumbered A zones and AE zones, on the Flood Insurance Rate Maps (FIRMs) for Jasper County on map panel numbers 29097C0187D and 29097C0191D dated March 16, 2006 and on map panel numbers 29097C0179E, 29097C0183E, 29097C0190E, 29097C0193E, and 29097C0325F, dated November 2, 2012 as amended, and any future revisions thereto. In all areas covered by this article, no development shall be permitted except through the issuance of a floodplain development permit, granted by the city council or its duly designated representative under such safeguards and restrictions as the city council or the designated representative may reasonably impose for the promotion and maintenance of the general welfare, health of the inhabitants of the community, and as specifically noted in division 4.

(Ord. No. 04-39, Art. 2, § A, 8-10-2004; Ord. No. 06-13, § I, 2-28-2006; Ord. No. 07-12, § 1, 3-13-2006; Ord. No. 12-35, § I, 8-28-2012)

Sec. 17-122. - Floodplain administrator.

The director of public works is hereby designated as the floodplain administrator under this article.

(Ord. No. 04-39, Art. 2, § B, 8-10-2004)

Sec. 17-123. - Compliance.

No development located within the special flood hazard areas of this community shall be located, extended, converted, or structurally altered without full compliance with the terms of this article and other applicable regulations.

(Ord. No. 04-39, Art. 2, § C, 8-10-2004)

Sec. 17-124. - Abrogation and greater restrictions.

It is not intended by this article to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this article imposes greater restrictions, the provisions of this article shall prevail. All other ordinances inconsistent with this article are hereby repealed to the extent of the inconsistency only.

(Ord. No. 04-39, Art. 2, § D, 8-10-2004)

Sec. 17-125. - Interpretation.

In their interpretation and application, the provisions of this article shall be held to be minimum requirements, shall be liberally construed in favor of the governing body, and shall not be deemed a limitation or repeal of any other powers granted by state statutes.

(Ord. No. 04-39, Art. 2, § E, 8-10-2004)

Sec. 17-126. - Warning and disclaimer of liability.

The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on rare occasions or the flood heights may be increased by manmade or natural causes, such as ice jams and bridge openings restricted by debris. This article does not imply that areas outside the floodway and flood fringe or land uses permitted within such areas will be free from flooding or flood damage. This article shall not create a liability on the part of city, any officer or employee thereof, for any flood damages that may result from reliance on this article or any administrative decision lawfully made thereunder.

(Ord. No. 04-39, Art. 2, § F, 8-10-2004)

Sec. 17-127. - Severability.

If any section, clause, provision, or portion of this article is adjudged unconstitutional or invalid by a court of appropriate jurisdiction, the remainder of this article shall not be affected thereby.

(Ord. No. 04-39, Art. 2, § G, 8-10-2004)

Secs. 17-128—17-140. - Reserved.

Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 17 - PLANNING AND DEVELOPMENT >> ARTICLE VI. - FLOODPLAIN MANAGEMENT ORDINANCE >> DIVISION 3. - ADMINISTRATION >>

DIVISION 3. - ADMINISTRATION

Sec. 17-141. - Floodplain development permit (required).

Sec. 17-142. - Designation of floodplain administrator.

Sec. 17-143. - Duties and responsibilities of floodplain administrator.

Sec. 17-144. - Application for floodplain development permit.

Secs. 17-145—17-160. - Reserved.

Sec. 17-141. - Floodplain development permit (required).

A floodplain development permit shall be required for all proposed construction or other development, including the placement of manufactured homes, in the areas described in section 17-121. No person, firm, corporation, or unit of government shall initiate any development or substantial-improvement or cause the same to be done without first obtaining a separate floodplain development permit for each structure or other development. * A fee of twenty-five dollars (\$25.00) per permit shall be charged for each approved permit application.

(Ord. No. 04-39, Art. 3, § A, 8-10-2004)

Sec. 17-142. - Designation of floodplain administrator.

The director of public works is hereby appointed to administer and implement the provisions of this article.

(Ord. No. 04-39, Art. 3, § B, 8-10-2004)

Sec. 17-143. - Duties and responsibilities of floodplain administrator.

Duties of the director of public works shall include, but not be limited to:

1. Review of all applications for floodplain development permits to assure that sites are reasonably safe from flooding and that the floodplain development permit requirements of this ordinance have been satisfied;
2. Review of all applications for floodplain development permits for proposed development to assure that all necessary permits have been obtained from federal, state, or local governmental agencies from which prior approval is required by federal, state, or local law;
3. Review all subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding;
4. Issue floodplain development permits for all approved applications;
5. Notify adjacent communities and the Missouri State Emergency Management Agency prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency (FEMA);
6. Assure that the flood carrying capacity is not diminished and shall be maintained within the altered or relocated portion of any watercourse;
7. Verify and maintain a record of the actual elevation (in relation to mean sea level) of the lowest floor, including basement, of all new or substantially improved structures;
8. Verify and maintain a record of the actual elevation (in relation to mean sea level) that the new or substantially improved non-residential structures have been floodproofed;
9. When floodproofing techniques are utilized for a particular non-residential structure, the director of public works shall require certification from a registered professional engineer or architect.

(Ord. No. 04-39, Art. 3, § C, 8-10-2004)

Sec. 17-144. - Application for floodplain development permit.

To obtain a floodplain development permit, the applicant shall first file an application in writing on a form furnished for that purpose. Every floodplain development permit application shall:

1. Describe the land on which the proposed work is to be done by lot, block and tract, house and street address, or similar description that will readily identify and specifically locate the proposed structure or work;
2. Identify and describe the work to be covered by the floodplain development permit;
3. Indicate the use or occupancy for which the proposed work is intended;
4. Indicate the assessed value of the structure and the fair market value of the improvement;

5. Specify whether development is located in designated flood fringe or floodway;
6. Identify the existing base flood elevation and the elevation of the proposed development;
7. Give such other information as reasonably may be required by the director of public works;
8. Be accompanied by plans and specifications for proposed construction; and
9. Be signed by the permittee or his authorized agent who may be required to submit evidence to indicate such authority.

(Ord. No. 04-39, Art. 3, § D, 8-10-2004)

Secs. 17-145—17-160. - Reserved.

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DIVISION 4. - PROVISIONS FOR FLOOD HAZARD REDUCTION

Sec. 17-161. - General standards.

Sec. 17-162. - Specific standards.

Sec. 17-163. - Manufactured homes.

Sec. 17-164. - Floodway.

Sec. 17-165. - Recreational vehicles.

Sec. 17-161. - General standards.

1. No permit for floodplain development shall be granted for new construction, substantial-improvements, and other improvements, including the placement of manufactured homes, within any numbered or unnumbered A zones and AE zones, unless the conditions of this section are satisfied.
2. All areas identified as unnumbered A zones on the FIRM are subject to inundation of the 100-year flood; however, the base flood elevation is not provided. Development within unnumbered A zones is subject to all provisions of this article. If flood insurance study data is not available, the community shall obtain, review, and reasonably utilize any base flood elevation or floodway data currently available from federal, state, or other sources.
3. Until a floodway is designated, no new construction, substantial improvements, or other development, including fill, shall be permitted within any numbered A zone or AE zone on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community.
4. All new construction, subdivision proposals, substantial-improvements, prefabricated structures, placement of manufactured homes, and other developments shall require:
 - a. Design or adequate anchorage to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
 - b. Construction with materials resistant to flood damage;
 - c. Utilization of methods and practices that minimize flood damages;

- d. All electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
 - e. New or replacement water supply systems and/or sanitary sewage systems be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and on-site waste disposal systems be located so as to avoid impairment or contamination; and
 - f. Subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, located within special flood hazard areas are required to assure that:
 - (1) All such proposals are consistent with the need to minimize flood damage;
 - (2) All public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage;
 - (3) Adequate drainage is provided so as to reduce exposure to flood hazards; and
 - (4) All proposals for development, including proposals for manufactured home parks and subdivisions, of five (5) acres or fifty (50) lots, whichever is lesser, include within such proposals base flood elevation data.
5. *Storage, material, and equipment.*
- a. The storage or processing of materials within the special flood hazard area that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited.
 - b. Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.
6. *Accessory structures.* Structures used solely for parking and limited storage purposes, not attached to any other structure on the site, of limited investment value, and not larger than four hundred (400) square feet, may be constructed at-grade and wet-floodproofed provided there is no human habitation or occupancy of the structure; the structure is of single-wall design; a variance has been granted from the standard floodplain management requirements of this article; and a floodplain development permit has been issued.
7. *Agricultural structures.* Structures used solely for agricultural purposes in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock, may be constructed at-grade and wet-floodproofed provided there is no human habitation or occupancy of the structure; the structure is of single-wall design; there is no permanent retail, wholesale, or manufacturing use included in the structure; a variance has been granted from the floodplain management requirements of this article; and a floodplain development permit has been issued.

(Ord. No. 04-39, Art. 4, § A, 8-10-2004; Ord. No. 12-35, § I, 8-28-2012)

Sec. 17-162. - Specific standards.

1. In all areas identified as numbered and unnumbered A zones and AE zones, where base flood elevation data have been provided, as set forth in section 17-161(2), the following provisions are required:
 - a. *Residential construction.* New construction or substantial-improvement of any residential structures, including manufactured homes, shall have the lowest floor, including basement, elevated to one (1) (feet/foot) above base flood elevation.

* [In all unnumbered and numbered A zones and AE zones, the FEMA, Region VII office recommends elevating to one (1) foot above the base flood elevation to accommodate floodway conditions when the floodplain is fully developed.]

- b. *Non-residential construction.* New construction or substantial-improvement of any commercial, industrial, or other non-residential structures, including manufactured homes, shall have the lowest floor, including basement, elevated to one (1) (feet/foot) above the base flood elevation or, together with attendant utility and sanitary facilities, be floodproofed so that below the base flood elevation the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification shall be provided to the floodplain administrator as set forth in section 17-143(9).

* [The FEMA, Region VII office recommends elevating to one (1) foot above the base flood elevation to qualify for flood insurance rates based upon floodproofing.]

- c. Require, for all new construction and substantial-improvements, that fully enclosed areas below lowest floor used solely for parking of vehicles, building access, or storage in an area other than a basement and that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:
- (1) A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided; and
 - (2) the bottom of all opening shall be no higher than one (1) foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

(Ord. No. 04-39, Art. 4, § B, 8-10-2004)

Sec. 17-163. - Manufactured homes.

1. All manufactured homes to be placed within all unnumbered and numbered A zones and AE zones, on the community's FIRM shall be required to be installed using methods and practices that minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors.
2. Require manufactured homes that are placed or substantially improved within unnumbered or numbered A zones and AE zones, on the community's FIRM on sites:
 - a. Outside of manufactured home park or subdivision;
 - b. In a new manufactured home park or subdivision;
 - c. In an expansion to an existing manufactured home park or subdivision; or
 - d. In an existing manufactured home park or subdivision on which a manufactured home has incurred substantial-damage as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to one (1) (feet/foot) above the base flood elevation and be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
- 3.

Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within all unnumbered and numbered A zones and AE zones, on the community's FIRM, that are not subject to the provisions of subsection 2. of this section, be elevated so that either:

- a. The lowest floor of the manufactured home is at one (1) (feet/foot) above the base flood level; or
- b. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade and be securely attached to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

* [In all unnumbered and numbered A zones and AE zones, the FEMA, Region VII office recommends elevating to one (1) foot above the base flood elevation to accommodate floodway conditions when the floodplain is fully developed.]

(Ord. No. 04-39, Art. 4, § C, 8-10-2004)

Sec. 17-164. - Floodway.

Located within areas of special flood hazard established in section 17-121 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters that carry debris and potential projectiles, the following provisions shall apply:

1. The community shall select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood without increasing the water surface elevation of that flood more than one (1) foot at any point.
2. The community shall prohibit any encroachments, including fill, new construction, substantial-improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.
3. If subsection 2. of this section is satisfied, all new construction and substantial-improvements shall comply with all applicable flood hazard reduction provisions of division 4.
4. In unnumbered A zones, the community shall obtain, review, and reasonably utilize any base flood elevation or floodway data currently available from federal, state, or other sources as set forth in section 17-161(2).

(Ord. No. 04-39, Art. 4, § D, 8-10-2004)

Sec. 17-165. - Recreational vehicles.

1. Require that recreational vehicles placed on sites within all unnumbered and numbered A zones and AE zones on the community's FIRM either:
 - a. Be on the site for fewer than one hundred eighty (180) consecutive days, or
 - b. Be fully licensed and ready for highway use*; or
 - c. Meet the permitting, elevation, and the anchoring requirements for manufactured homes of this article.

* A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick-disconnect type utilities and security devices, and has no permanently attached additions.

(Ord. No. 04-39, Art. 4, § E, 8-10-2004)

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DIVISION 5. - FLOODPLAIN MANAGEMENT VARIANCE PROCEDURES

Sec. 17-171. - Establishment of appeal board.

Sec. 17-172. - Responsibility of appeal board.

Sec. 17-173. - Further appeals.

Sec. 17-174. - Floodplain management variance criteria.

Sec. 17-175. - Conditions for approving floodplain management variances.

Sec. 17-176. - Conditions for approving variances for agricultural structures.

Secs. 17-177—17-190. - Reserved.

Sec. 17-171. - Establishment of appeal board.

The board of adjustment as established by the city shall hear and decide appeals and requests for variances from the floodplain management requirements of this article.

(Ord. No. 04-39, Art. 5, § A, 8-10-2004)

Sec. 17-172. - Responsibility of appeal board.

Where an application for a floodplain development permit or request for a variance from the floodplain management regulations is denied by the director of public works the applicant may apply for such floodplain development permit or variance directly to the appeal board, as defined in section 17-171.

The board of adjustment shall hear and decide appeals when it is alleged that there is an error in any requirement, decision, or determination made by the director of public works in the enforcement or administration of this article.

(Ord. No. 04-39, Art. 5, § B, 8-10-2004)

Sec. 17-173. - Further appeals.

Any person aggrieved by the decision of the board of adjustment or any taxpayer may appeal such decision to the Circuit Court of Jasper County as provided in 89.110 of Revised Statutes of the State of Missouri.

(Ord. No. 04-39, Art. 5, § C, 8-10-2004)

Sec. 17-174. - Floodplain management variance criteria.

In passing upon such applications for variances, the board of adjustment shall consider all technical data and evaluations, all relevant factors, standards specified in other sections of this article, and the following criteria:

1. The danger to life and property due to flood damage;
2. The danger that materials may be swept onto other lands to the injury of others;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative locations, not subject to flood damage, for the proposed use;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters, if applicable, expected at the site; and,
11. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems; streets; and bridges.

(Ord. No. 04-39, Art. 5, § D, 8-10-2004)

Sec. 17-175. - Conditions for approving floodplain management variances.

1. Generally, variances may be issued for new construction and substantial-improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items 2 through 6 below have been fully considered. As the lot size increases beyond the one-half acre, the technical justification required for issuing the variance increases.
2. Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places, the State Inventory of Historic Places, or local inventory of historic places upon determination provided the proposed activity will not preclude the structure's continued historic designation.
3. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
4. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
5. Variances shall only be issued upon (a) a showing of good and sufficient cause, (b) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (c) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
6. A community shall notify the applicant in writing over the signature of a community official that (1) the issuance of a variance to construct a structure below base flood level will result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars (\$25.00) for one hundred dollars (\$100.00) of insurance coverage and (2) such construction

below the base flood level increases risks to life and property. Such notification shall be maintained with the record of all variance actions as required by this article.

(Ord. No. 04-39, Art. 5, § E, 8-10-2004)

Sec. 17-176. - Conditions for approving variances for agricultural structures.

Any variance granted for an agricultural structure shall be decided individually based on a case by case analysis of the building's unique circumstances. Variances granted shall meet the following conditions as well as those criteria and conditions set forth in division 5, sections 17-174 and 17-175 of this article.

In order to minimize flood damages during the 100-year flood and the threat to public health and safety, the following conditions shall be included for any variance issued for agricultural structures that are constructed at-grade and wet-floodproofed.

1. All agricultural structures considered for a variance from the floodplain management regulations of this article shall demonstrate that the varied structure is located in wide, expansive floodplain areas and no other alternate location outside of the special flood hazard area exists for the agricultural structure. Residential structures, such as farm houses, cannot be considered agricultural structures.
2. Use of the varied structures must be limited to agricultural purposes in zone A only as identified on the community's flood insurance rate map (FIRM).
3. For any new or substantially damaged agricultural structures, the exterior and interior building components and elements (i.e., foundation, wall framing, exterior and interior finishes, flooring, etc.) below the base flood elevation, must be built with flood-resistant materials in accordance with section 17-161(4)b.
4. The agricultural structures must be adequately anchored to prevent flotation, collapse, or lateral movement of the structures in accordance with section 17-161(4)a. All of the building's structural components must be capable of resisting specific flood-related forces including hydrostatic, buoyancy, and hydrodynamic and debris impact forces.
5. Any mechanical, electrical, or other utility equipment must be located above the base flood elevation or floodproofed so that they are contained within a watertight, floodproofed enclosure that is capable of resisting damage during flood conditions in accordance with section 17-161(4)d.
6. The agricultural structures must meet all National Flood Insurance Program (NFIP) opening requirements. The NFIP requires that enclosure or foundation walls, subject to the 100-year flood, contain openings that will permit the automatic entry and exit of floodwaters in accordance with section 17-162(1)c.
7. Major equipment, machinery, or other contents must be protected from any flood damage.
8. No disaster relief assistance under any program administered by any federal agency shall be paid for any repair or restoration costs of the agricultural structures.
9. A community shall notify the applicant in writing over the signature of a community official that (1) the issuance of a variance to construct a structure below base flood level will result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars (\$25.00) for one hundred dollars (\$100.00) of insurance coverage and (2) such construction below the base flood level increases risks to life and property. Such notification shall be maintained with the record of all variance actions as required by this article.
- 10.

Wet-floodproofing construction techniques must be reviewed and approved by the community and a registered professional engineer or architect prior to the issuance of any floodplain development permit for construction.

(Ord. No. 04-39, Art. 5, § F, 8-10-04; Ord. No. 12-35, § I, 8-28-12)

Secs. 17-177—17-190. - Reserved.

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DIVISION 6. - AMENDMENTS

Sec. 17-191. - Amendments.

Secs. 17-192—17-210. - Reserved.

Sec. 17-191. - Amendments.

The regulations, restrictions, and boundaries set forth in this article may from time to time be amended, supplemented, changed, or appealed to reflect any and all changes in the National Flood Disaster Protection Act of 1973, provided, however, that no such action may be taken until after a public hearing in relation thereto, at which parties of interest and citizens shall have an opportunity to be heard. Notice of the time and place of such hearing shall be published in a newspaper of general circulation in the city. At least twenty (20) days shall elapse between the date of this publication and the public hearing. A copy of such amendments will be provided to the Region VII office of the Federal Emergency Management Agency (FEMA). The regulations of this article are in compliance with the National Flood Insurance Program (NFIP) regulations.

(Ord. No. 04-39, Art. 6, 8-10-2004)

Secs. 17-192—17-210. - Reserved.

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DIVISION 7. - DEFINITIONS

Sec. 17-211. - Definitions.

Secs. 17-212—17-230. - Reserved.

Sec. 17-211. - Definitions.

Unless specifically defined below, words or phrases used in this article shall be interpreted so as to give them the same meaning they have in common usage and to give this article its most reasonable application.

100-year flood. See "base flood."

Accessory structure means the same as "appurtenant structure."

Actuarial rates. See "risk premium rates."

Administrator means the Federal Insurance Administrator.

Agency means the Federal Emergency Management Agency (FEMA).

Agricultural commodities means agricultural products and livestock.

Agricultural structure means any structure used exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities.

Appeal means a request for review of the floodplain administrator's interpretation of any provision of this article or a request for a variance.

Appurtenant structure means a structure that is on the same parcel of property as the principle structure to be insured and the use of which is incidental to the use of the principal structure.

Area of special flood hazard is the land in the floodplain within a community subject to a one (1) percent or greater chance of flooding in any given year.

Base flood means the flood having a one (1) percent chance of being equaled or exceeded in any given year.

Basement means any area of the structure having its floor subgrade (below ground level) on all sides.

Building. See "structure."

Chief executive officer or *chief elected official* means the official of the community who is charged with the authority to implement and administer laws, ordinances, and regulations for that community.

Community means any state or area or political subdivision thereof, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

Development means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, levees, levee systems, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

Elevated building means for insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

Eligible community or *participating community* means a community for which the administrator has authorized the sale of flood insurance under the National Flood Insurance Program (NFIP).

Existing construction means for the purposes of determining rates, structures for which the "start of construction" commenced before the effective date of the FIRM or before January 1, 1975, for FIRMs effective before that date. "existing construction" may also be referred to as "existing structures."

Existing manufactured home park or subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.

Expansion to an existing manufactured home park or subdivision means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

Flood or flooding means a general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland and/or (2) the unusual and rapid accumulation or runoff of surface waters from any source.

Flood boundary and floodway map (FBFM) means an official map of a community on which the administrator has delineated both special flood hazard areas and the designated regulatory floodway.

Flood elevation determination means a determination by the administrator of the water surface elevations of the base flood, that is, the flood level that has a one (1) percent or greater chance of occurrence in any given year.

Flood elevation study means an examination, evaluation and determination of flood hazards.

Flood fringe means the area outside the floodway encroachment lines, but still subject to inundation by the regulatory flood.

Flood hazard boundary map (FHBM) means an official map of a community, issued by the administrator, where the boundaries of the flood areas having special flood hazards have been designated as (unnumbered or numbered) A zones.

Flood insurance rate map (FIRM) means an official map of a community, on which the administrator has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

Flood insurance study (FIS) means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.

Floodplain or flood-prone area means any land area susceptible to being inundated by water from any source (see "flooding").

Floodplain management means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

Floodplain management regulations means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain and grading ordinances) and other applications of police power. The term describes such state or local regulations, in any combination thereof, that provide standards for the purpose of flood damage prevention and reduction.

Flood proofing means any combination of structural and nonstructural additions, changes, or adjustments to structures that reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, or structures and their contents.

Floodway or regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot.

Floodway encroachment lines means the lines marking the limits of floodways on federal, state and local floodplain maps.

Freeboard means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as bridge openings and the hydrological effect of urbanization of the watershed.

Functionally dependent use means a use that cannot perform its intended purpose unless it is located or carried out in close proximity to water. This term includes only docking facilities and facilities that are necessary for the loading and unloading of cargo or passengers, but does not include long-term storage or related manufacturing facilities.

Highest adjacent grade means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure means any structure that is (a) listed individually in the National Register of Historic Places (a listing maintained by the department of interior) or preliminarily determined by the secretary of the interior as meeting the requirements for individual listing on the National Register; (b) certified or preliminarily determined by the secretary of the interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the secretary to qualify as a registered historic district; (c) individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the secretary of the interior; or (d) individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either (1) by an approved state program as determined by the secretary of the interior or (2) directly by the secretary of the interior in states without approved programs.

Lowest floor means the lowest floor of the lowest enclosed area, including basement. An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable floodproofing design requirements of this article.

Manufactured home means a structure, transportable in one (1) or more sections, that is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

Manufactured home park or subdivision means a parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

Map means the flood hazard boundary map (FHBM), flood insurance rate map (FIRM), or the flood boundary and floodway map (FBFM) for a community issued by the Federal Emergency Management Agency (FEMA).

Market value or fair market value means an estimate of what is fair, economic, just and equitable value under normal local market conditions.

Mean sea level means, for purposes of the National Flood Insurance Program (NFIP), the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's flood insurance rate map (FIRM) are referenced.

New construction means, for the purposes of determining insurance rates, structures for which the "start of construction" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, "new construction" means structures for which the "start of construction" commenced on or after the effective date of the floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.

New manufactured home park or subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lot on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by the community.

(NFIP) means the National Flood Insurance Program (NFIP).

Participating community also known as an *eligible community*, means a community in which the administrator has authorized the sale of flood insurance.

Person includes any individual or group of individuals, corporation, partnership, association, or any other entity, including federal, state, and local governments and agencies.

Principally above ground means that at least fifty-one (51) percent of the actual cash value of the structure, less land value, is above ground.

Recreational vehicle means a vehicle which is (a) built on a single chassis; (b) four hundred (400) square feet or less when measured at the largest horizontal projections; (c) designed to be self-propelled or permanently towable by a light-duty truck; and (d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Remedy a violation means to bring the structure or other development into compliance with federal, state, or local floodplain management regulations; or, if this is not possible, to reduce the impacts of its noncompliance.

Repetitive loss means flood-related damages sustained by a structure on two (2) separate occasions during a ten-year period for which the cost of repairs at the time of each such flood event, equals or exceeds twenty-five (25) percent of the market value of the structure before the damage occurred.

Risk premium rates means those rates established by the administrator pursuant to individual community studies and investigations which are undertaken to provide flood insurance in accordance with Section 1307 of the National Flood Disaster Protection Act of 1973 and the accepted actuarial principles. "Risk premium rates" include provisions for operating costs and allowances.

Special flood hazard area. See "area of special flood hazard."

Special hazard area" means an area having special flood hazards and shown on an FHBM, FIRM or FBFM as zones (unnumbered or numbered) A and AE.

Start of construction includes substantial-improvements, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvements were within one hundred eighty (180) days of the permit date. The "actual start" means either the first placement of permanent construction of a structure on a site, such as the pouring of slabs or footings, the installation of piles, the construction of columns, any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling, the installation of streets and/or walkways, excavation for a basement, footings, piers, foundations, the erection of temporary forms, nor installation on the property of accessory structures, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial-improvement, the "actual start of construction" means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

State coordinating agency means that agency of the state government, or other office designated by the governor of the state or by state statute at the request of the administrator to assist in the implementation of the National Flood Insurance Program (NFIP) in that state.

Structure means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. "Structure" for insurance purposes, means a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.

Substantial-damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred. The term includes repetitive loss buildings (see definition).

For the purposes of this definition, "repair" is considered to occur when the first repair or reconstruction of any wall, ceiling, floor, or other structural part of the building commences. The term does not apply to:

- (a) Any project for improvement of a building required to comply with existing health, sanitary, or safety code specifications which have been identified by the code enforcement official and which are solely necessary to assure safe living conditions; or
- (b) Any alteration of a "historic structure" provided that the alteration will not preclude the structure's continued designation as a "historic structure; or
- (c) Any improvement to a building.

Substantial-improvement means any combination of reconstruction, alteration, or improvement to a building, taking place during a ten-year period, in which the cumulative percentage of improvement equals or exceeds fifty (50) percent of the current market value of the building. For the purposes of this definition, an improvement occurs when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the building. This term includes structures, which have incurred "repetitive loss" or "substantial damage," regardless of the actual repair work done. The term does not apply to:

- (a)

Any project for improvement of a building required to comply with existing health, sanitary, or safety code specifications which have been identified by the code enforcement official and which are solely necessary to assure safe living conditions; or

- (b) Any alteration of a "historic structure" provided that the alteration will not preclude the structure's continued designation as a "historic structure"; or
- (c) Any building that has been damaged from any source or is categorized as repetitive loss.

Substantially improved existing manufactured home parks or subdivisions is where the repair, reconstruction, rehabilitation or improvement of the streets, utilities and pads equals or exceeds fifty (50) percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced.

Variance means a grant of relief by the community from the terms of a floodplain management regulation. Flood insurance requirements remain in place for any varied use or structure and cannot be varied by the community.

Violation means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required by this article is presumed to be in violation until such time as that documentation is provided.

Water surface elevation means the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929 (or other datum where specified) of floods of various magnitudes and frequencies in the floodplain.

(Ord. No. 04-39, Art. 7, 8-10-2004; Ord. No. 12-35, § 1, 8-28-2012)

Secs. 17-212—17-230. - Reserved.

Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 17 - PLANNING AND DEVELOPMENT >> **ARTICLE VI. - FLOODPLAIN MANAGEMENT ORDINANCE** >> DIVISION 8. - PENALTIES FOR VIOLATION >>

DIVISION 8. - PENALTIES FOR VIOLATION

Sec. 17-231. - Penalties for violation.

Sec. 17-231. - Penalties for violation.

Violations of the provisions of this article or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with granting of variances) shall constitute a misdemeanor. Any person who violates this article or fails to comply with any of its requirements shall, upon conviction thereof, be fined as specified in section 1-12 of the Code of Carthage, and in addition, shall pay all costs and expenses involved in the case. Each day such violation continues shall be considered a separate offense. Nothing herein contained shall prevent the city or other appropriate authority from taking such other lawful action as is necessary to prevent or remedy any violation.

(Ord. No. 05-25, § 1, 5-10-2005)

Sec. 24-177. - Stormwater, surface water, etc.

- (a) No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water or unpolluted industrial process waters to any sanitary sewer.
- (b) Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers, or to a natural outlet approved by the superintendent. Industrial cooling water or unpolluted process waters may be discharged, on approval of the superintendent, to a storm sewer, combined sewer, or natural outlet.

(Code 1978, § 530.050(A), (B))

Sec. 24-178. - Prohibited discharges.

No person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewers:

- (1) Any gasoline, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid or gas.
- (2) Any waters or wastes containing toxic or poisonous solids, liquids, or gases in sufficient quantity, either singly or by interaction with other wastes, to injure, or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plant, including but not limited to cyanides in excess of two (2) mg/l as CN in the wastes as discharged to the public sewer.
- (3) Any waters or wastes having a pH lower than 5.5 or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the sewage works.
- (4) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewage works such as, but not limited to, ashes, cinders, sand, unground garbage, shavings, straw, mud, metal, glass, rags, feathers, tar, plastics, wood, whole blood, paunch manure, hair and fleshings, entrails and paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders.

(Code 1978, § 530.050(C))

Sec. 24-179. - Certain discharges regulated and restricted.

- (a) No person shall discharge or cause to be discharged the following described substances, materials, waters, or wastes if it appears likely in the opinion of the superintendent that such wastes can harm either the sewers, sewage treatment process, or equipment, have an adverse effect on the receiving stream or can otherwise endanger life, limb, public property, or constitute a nuisance. In forming his opinion as to the acceptability of these wastes the superintendent will give consideration of such factors as the quantities of subject wastes in relation to flows and velocities in the sewers, materials of construction of the sewers, nature of the sewage treatment process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant, and other pertinent factors. The substances prohibited are:

- (1)

- Any liquid or vapor having a temperature higher than one hundred fifty (150) degrees Fahrenheit.
- (2) Any water or waste containing fat, wax, grease, or oils, whether emulsified or not, in excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between thirty-two (32) and one hundred fifty (150) degrees.
 - (3) Any garbage that has not been properly shredded. The installations and operation of any garbage grinder equipped with a motor of three-fourths horsepower (0.76 hp metric) or greater shall be subject to the review and approval of the superintendent.
 - (4) Any waters or wastes containing strong acid iron pickling wastes, or concentrated plating solutions whether neutralized or not.
 - (5) Any waters and wastes containing iron, chromium, copper, zinc, and similar objectionable or toxic substances; or wastes exerting an excessive chlorine requirement to such a degree that any such material received in the composite sewage at the sewage treatment works exceeds the limits established by the superintendent for such materials.
 - (6) Any waters or wastes containing phenols or other taste-or odor-producing substances, in such concentrations exceeding limits which may be established by the superintendent as necessary, after treatment of the composite sewage, to meet the requirements of the state, federal, or other public agencies of jurisdiction for such discharge to the receiving waters.
 - (7) Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the superintendent in compliance with applicable state or federal regulations.
 - (8) Any waters or wastes having pH in excess of 9.5.
 - (9) Materials which exert or cause:
 - a. Unusual concentrations of inert suspended solids (such as, but not limited to, fuller's earth, lime slurries, and lime residues) or of dissolved solids (such as, but not limited to, sodium chloride and sodium sulfate.)
 - b. Excessive discoloration (such as, but not limited to, dye wastes and vegetable tanning solutions.)
 - c. Unusual BOD, chemical oxygen demand, or chlorine requirements in such quantities as to constitute a significant load on the sewage treatment works.
 - d. Unusual volume of flow or concentration of wastes constituting slugs.
 - (10) Waters or wastes containing substances which are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirement of other agencies having jurisdiction over discharge to the receiving waters.
 - (11) Water or wastes which fail to comply with federal pretreatment standards pursuant to the Code of Federal Regulations, title 40, part 403 (40CFR403).
 - (12) Any waters or wastes:
 - a. Having a five-day BOD greater than three hundred fifty (350) parts per million by weight; or
 - b. Containing more than three hundred fifty (350) parts per million, by weight, of suspended solids; or
 - c. Having an average daily flow greater than two (2) percent of the average sewage flow of the city;

Shall be subject to the review of the superintendent. Where necessary in the opinion of the superintendent, the owner shall provide, at his expense, such preliminary treatment as may be necessary to:

1. Reduce the biochemical oxygen demand to three hundred (300) parts per million by weight; or
 2. Reduce the suspended solids to three hundred fifty (350) parts per million by weight; or
 3. Control the quantities and rates of discharge of such water or wastes. Plans, specifications, and any other pertinent information relating to proposed preliminary treatment facilities shall be submitted for the approval of the superintendent and no construction of such facilities shall be commenced until said approvals are obtained in writing.
- (b) Any waters or wastes which are discharged, or are proposed to be discharged to the public sewers, which waters contain the substances or possess the characteristics enumerated in subsection (a) of this section, and which in the judgment of the superintendent, may have a deleterious effect upon the sewage works, processes, equipment, or receiving waters, or which otherwise create a hazard to life or constitute a public nuisance, the superintendent may:
- (1) Reject the wastes;
 - (2) Require pretreatment to an acceptable condition for discharge to the public sewers;
 - (3) Require control over the quantities and rates of discharge; and/or
 - (4) Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges.

If the superintendent permits the pretreatment or equalization of waste flows, the design and time schedule for installation of the plans and equipment shall be subject to the review and approval of the superintendent, and subject to the requirements of all applicable codes, ordinances and laws.

(Code 1977, § 530.050(D),(E))

Carthage, Missouri, Code of Ordinances >> - CODE >> Chapter 24 - WATER, SEWERS AND SEWAGE DISPOSAL >> **ARTICLE IV. - STORMWATER DETENTION >>**

ARTICLE IV. - STORMWATER DETENTION ^[83]

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- Sec. 24-207.1. - Energy dissipation.
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Sec. 24-201. - In General.

Stormwater runoff and the velocity of discharge are considerably increased through development and growth of the city.

Prior to the development of the land, surface conditions provide a higher percentage of permeability and longer time of concentration. With the construction of buildings, parking lots, etc., permeability and the time of concentration are significantly decreased, resulting in an increase in both the rate and volume of runoff.

These modifications may create harmful effects on properties downstream. Therefore, to minimize these effects the following minimum stormwater detention requirements have been established.

This section shall apply to all industrial, commercial, institutional, apartment developments, and all housing developments containing one (1) acre or more, within the incorporated limits of the City of Carthage. Detention on areas of less than one (1) acre in size shall be at the discretion of the city engineer.

All housing developments containing one (1) acre or more lying outside the corporate limits of the City of Carthage shall not be considered for annexation until the owner of said development has submitted information to the City of Carthage Engineering Department showing stormwater retention plans as necessary to comply with the provisions of this section. Detention on areas of less than one (1) acre in size shall be at the discretion of the city engineer.

This section shall not apply to platted subdivisions or additions filed of record prior to the passage of this section, in which the streets and utilities have been constructed.

(Ord. No. 6628, § 1 (§ 1(A), 7-26-94; Ord. No. 97-50, § 1, 9-23-97)

Sec. 24-202. - Stormwater detention plans.

A complete set of stormwater detention plans and calculations shall be provided for all construction projects which increase stormwater runoff.

Plans for the construction of public improvements shall be submitted to and approved by the city engineer.

The required stormwater detention plans for private improvements shall be submitted along with the building plans to the city engineer for review and approval. These plans shall be prepared by a professional engineer licensed to practice in the State of Missouri.

(Ord. No. 6628, § 1 (B), 7-26-94)

Sec. 24-203. - General.

Introduction: This document provides acceptable procedures for designing storm drainage systems and detention facilities within the City of Carthage, Missouri. While these procedures or methods will provide for the design of most drainage systems and storage facilities, certain situations may require additional criteria or a more in-depth design than that described in this document. Designers are encouraged to discuss anticipated requirements for any new or rehabilitated system with the city engineer prior to commencing design.

Related documents: Construction requirements of components of the stormwater drainage system shall be as specified in the Standard Specifications for Street Construction, City of Carthage.

Erosion from construction activities shall be controlled as per the requirements of the City of Carthage, Model Best Management Practices (BMP's) for Land Disturbance.

Applicability: The criteria within this document shall apply to all new and storm drainage and detention facilities and to the rehabilitation of existing drainage systems and facilities.

Design requirements: All designs shall be completed under the direct supervision of a registered professional engineer licensed to practice in the State of Missouri. Designs shall be based on land use in the tributary area as zoned, as actually or proposed developed, or as indicated by the city's land use plan. The basis for determining which criteria shall be whichever use indicates the greatest runoff volume.

Precipitation data is shown in Table 1. These quantities shall be utilized in all calculations unless the designer can show sufficient evidence of justification for lesser amounts.

Runoff coefficients for various land uses are shown in Table 2 and shall be utilized for both pre-developed and post-developed conditions.

All drainage systems shall be designed with sufficient capacity to convey flows from a 25-year storm event.

Detention facilities shall be designed to limit post-development outflow volumes to equal to or less than pre-developed volumes for the 2-, 10-, 25-, 50- and 100-year rainfall events.

(Ord. No. 10-12, § 1, 5-11-10)

Editor's note—

Ord. No. 10-12, § 1, adopted May 11, 2010, repealed former § 24-203, and enacted a new § 24-203 as set out herein. Former § 24-203 pertained to method of evaluation and derived from Ord. No. 6628, § 1(C), July 26, 1994.

Sec. 24-203.1. - Key terms.

CFS means volume of flow, cubic feet per second.

City means the City of Carthage, Missouri having jurisdiction and authority to govern.

City engineer means the municipal public works engineer or official having the jurisdiction and authority to review and approve plans and designs for stormwater management.

Developer means any person, partnership, association, corporation, public agency, or governmental unit proposing to engage or currently engaged in development excluding the widening, resurfacing or other improvement to existing streets, alleys and sidewalks.

Development means any manmade change to improved or unimproved real estate. The changes may include but not be limited to buildings, structures, pavement, filling grading or storage of equipment or materials.

FPS means velocity, feet per second.

Improved channel means any new open channel which has been constructed or any existing channel which has been changed by grading or installation of lining materials.

Natural channel means any existing channel which has not been altered by previous construction.

Owner means the owner of record of real property.

Pre-developed conditions means the topography, surface cover and other hydrologic conditions in the watershed being considered as they exist prior to the proposed development.

Pre-developed conditions means the topography, surface cover and other hydrologic conditions in the watershed being considered after the proposed developments are completed.

Registered professional engineer means a person licensed in the State of Missouri to practice engineering.

Site means a tract or contiguous tracts of land owned or controlled by a developer or owner. Platted subdivisions, industrial or commercial parks and other planned developments shall be considered as a single tract.

Storm drainage system means all of the manmade and natural facilities which serve to convey surface drainage. Such facilities include but are not limited to, natural and improved channels, pipes, culverts, bridges, street gutters, gutter inlets, and detention systems.

Stormwater detention facility means any structure designed to control a stormwater discharge rate to less than the stormwater inflow rate.

Stormwater detention facility, dry means any detention facility, public or private, that is designed to permit no permanent impoundment of water.

Stormwater detention facility, private means any detention facility controlling discharge from a site wholly owned or controlled by one (1) owner or and not platted for future subdivision of ownership.

Stormwater detention facility, public means any detention facility controlling discharge from a tributary area owned by more than one (1) owner or platted for future subdivision ownership.

Stormwater detention facility, wet means any detention facility, public or private, that is designed to include temporary storage above a permanent pool of water and control stormwater discharge from the temporary pool.

Stormwater detention facility, regional means any detention facility designed and located to provide detention on drainage channels and with a tributary area of one hundred (100) acres or greater.

Tributary area means all land draining to the point of consideration regardless of ownership.

(Ord. No. 10-12, § 1, 5-11-10)

Sec. 24-204. - Drainage system types.

- (a) *Enclosed pipe with inlet system*: Enclosed systems consisting of curb inlets, storm sewer manholes, and similar appurtenances and all connected by underground piping shall be used to convey stormwater runoff under the following conditions:
 - (1) Within the right-of-way of an improved street, regardless of system design capacity.
 - (2) In residential areas where the bank line of an open channel (either natural or constructed) would be within sixty (60) feet of any existing or proposed residential structure.
 - (3) In all areas other than residential where the bank line of an open channel (either natural or constructed) would be within thirty (30) feet of any existing or proposed habitable structure, regardless of system design capacity.
 - (4) Enclosed systems may be used in lieu of open systems at all locations where open systems are allowed.
- (b) *Open system—Improved channel*: Systems consisting of improved open channels with intermittent culverts or bridges crossing streets and all other surfaced areas, may be used at all locations except in areas noted above.
- (c) *Open system—Natural channel*: Existing natural channels may be incorporated into the drainage system design when allowed by the public works department of the City of Carthage. The developer shall submit preliminary design proposals indicating areas in which a natural channel will be utilized. Natural channels may be utilized in all developments where the peak flow in the channel will exceed three hundred (300) CFS. Where design velocity exceeds the velocity noted below, the channel shall be improved as necessary or an enclosed system constructed.

Soil Type	Max. Velocity of 2-year Peak Flow (fps)
Fine sand, sandy loam	2
Silt loam, non-colloidal silts	3
Colloidal clays and silts, fine gravel	4

Coarse gravel, cobbles	5
Shale	8
Limestone bedrock	12

(Ord. No. 10-12, § I, 5-11-10)

Editor's note—

Ord. No. 10-12, § I, adopted May 11, 2010, repealed former § 24-204, and enacted a new § 24-204 as set out herein. Former § 24-204 pertained to volume of detention and derived from Ord. No. 6628, § I(D), July 26, 1994.

Sec. 24-205. - Drainage system design.

A drainage system shall be provided for all new developments. Components of the system may consist of any of the following items or combination thereof: open channels, culverts, storm sewers, curbs and gutters, curb inlets, and drop inlets.

All components shall be shown on the design plans and shall be designed with sufficient capacity to accommodate a 25-year storm event.

(Ord. No. 10-12, § I, 5-11-10)

Editor's note—

Ord. No. 10-12, § I, adopted May 11, 2010, repealed former § 24-205, and enacted a new § 24-205 as set out herein. Former § 24-205 pertained to method of detention and derived from Ord. No. 6628, § I(C), July 26, 1994 and Ord. No. 97-50, § I, Sept. 23, 1997.

Sec. 24-206. - Hydrologic criteria and methods.

- (a) *Computation methods for runoff:* Runoff rates for each element of the proposed storm drainage and detention systems shall be calculated using the criteria shown in Tables 1, 2 and 3.
- (b) *Rainfall:* Rainfall data for runoff computations are shown in Table 1.
- (c) *Runoff coefficients:* Runoff coefficients relative to pre-developed and post-developed land use shall be as shown in Table 2.

The runoff coefficient for areas of multiple types of development (i.e. subdivision of single-family homes with fringe area of duplex — patio homes) shall be determined by a weighted coefficient base on area of each type of development.

- (d) *Time of concentration (Tc):* Time of concentration shall be calculated by the SCS TR-55 method. This method is defined as the sum of sheet flow time, shallow concentrated flow time and channel flow time.

$$T_c = T_{\text{sheet}} + T_{\text{shallow}} + T_{\text{channel}}$$

Sheet flow time is defined by the formula:

$$T_{\text{sheet}} = \frac{0.007 (nL)^{0.8}}{P^{2.05} S^{0.4}}$$

Where:

- n = Manning's roughness coefficient
- L = flow length (must be <= 300 feet per TR-55)
- P2 = two-year 24-hour rainfall (inches)
- S = land slope (%)

Shallow concentrated flow time (T_{shallow}) (hours)

Shallow concentrated flow time is defined by the formula:

$$T_{\text{shallow}} = \frac{L}{3600V}$$

Where:

L = flow length (feet)

V = average velocity (fps)

and where V is defined as:

$$V = C_p \sqrt{S}$$

Where:

V = average velocity (ft./s)

C_p = 20.3282 paved surfaces

C_p = 16.1345 unpaved surfaces

S = watercourse slope (ft./ft.)

Channel flow time is defined by the formula:

$$T_{\text{channel}} = \frac{L}{3600V}$$

Where:

L = flow length (feet)

V = average velocity (fps)

and where V is defined as:

$$V = \frac{1.49R^{2/3}S^{1/2}}{n}$$

Where:

V = average velocity (ft./s)

R = hydraulic radius (ft.) = area/wetted perimeter

S = channel slope (ft./ft.) entered as percent

n = Manning's roughness coefficient

(Ord. No. 10-12, § I, 5-11-10)

Editor's note—

Ord. No. 10-12, § I, adopted May 11, 2010, repealed former § 24-206, and enacted a new § 24-206 as set out herein. Former § 24-206 pertained to verification of adequacy and derived from Ord. No. 6628, § I(F), July 26, 1994.

Sec. 24-206.1. - Hydraulic calculations.

- (a) *Pipes and open channels:* Flow in both pipes and open channels shall be calculated utilizing Manning's equation.

$$Q = \frac{A (1,486) (R^{2/3}) (S^{1/2})}{n}$$

Q = Discharge in cubic feet per second

A = Cross sectional area of flow in square feet

n = Roughness coefficient (see Table 3)

R = Hydraulic radius (R = A/P) in feet

S = Slope in feet per foot

P = Wetted perimeter in feet

Pipe network designs shall include:

- (1) Diameter of pipe;
 - (2) Slope of pipe in percent;
 - (3) Top of structure elevations; and
 - (4) Flowline of structure elevations.
- (b) *Culverts*: Culvert capacity shall be calculated per standard engineering practices.
- (c) *Street gutters*: Flow in street gutters shall be calculated by Izzard's formula.

$$Q = \frac{0.56 (z) (S^{1/2}) (D^{8/3})}{n}$$

Q = Discharge in cubic feet per second

z = the reciprocal of the average cross slope including gutter section in feet per foot

S = Slope in feet per foot

D = Depth of flow at curb face in feet

n = Roughness coefficient (see Table 3)

- (d) *Open channels*: Open channel designs shall include:
- (1) Channel slope in percent;
 - (2) Bottom width in feet;
 - (3) Side slopes (horizontal feet/vertical foot); and
 - (4) Type of construction (earth and grass, concrete liner, rock liner, gravel, etc.).
- (e) *Curb inlets*: Curb opening inlets (single, double or triple) with gutter deflectors, as specified and shown in the Standard Specifications for Street Construction, shall be installed. Inlets shall be spaced such that width of flow (measured from face of curb) in the streets is limited to the following:

Type of Street	Minimum Pavement Width (Back to Back of Curb)	Maximum Width of Flow (feet)
Freeway	48*	12
Expressway	48*	12
Arterial, urban	120	12
Arterial, rural	24	12
Collectors	41	10
Local, nonresidential, central traffic zone	41	10
Local, nonresidential, all other	41	10
Local, residential	31	6
Cul-de-sacs, residential (stem portion)	31	6
Estate lanes	31	6
Marginal Access roads	20	4

* Additional shoulder widths required for this type of street. Maximum width of flow is distance from face of curb.

Capacities of the inlets at maximum width of flow are shown in Table 4 - Inlet Capacities in section 24-207.2. These capacities shall be utilized in design of curb inlet locations.

(f) *Pipes and culverts.*

Minimum pipe size shall be fifteen (15) inches diameter.

Minimum cover for all pipes and culverts shall be twelve (12) inches.

Pipe sizes, based on square feet of end area, shall not decrease from upstream to downstream regardless of the calculated capacity of each conduit.

Flow in pipes shall be calculated utilizing Manning's equation.

$$Q = \frac{A (1.486) (R^{2/3}) (S^{1/2})}{n}$$

where:

Q = Discharge in cubic feet per second

A = Cross sectional area of flow in square feet

n = Roughness coefficient (see table below)

R = Hydraulic radius (R = A/P) in feet

S = Slope in feet per foot

P = Wetted perimeter in feet

Head losses, except friction losses, shall be calculated by

$$h = k (V^2/2g)^{1/2}$$

where:

h = Head loss in feet

V = velocity of flow in feet per second

2g = 64.4 feet per second

k = Coefficient

Typical n values for various pipe materials shall be as follows:

RCP	0.013
CSP	0.024
PVC	0.011
HDPE	0.010

(Ord. No. 10-12, § 1, 5-11-10)

Sec. 24-207. - Detention facilities for flood control.

Detention facilities shall be provided for all new and rehabilitation of existing developments. The facility shall be designed and constructed so as to control runoff rates and minimize downstream flooding. Detention facilities may be public or private and wet or dry.

Rooftop and parking lot detention are acceptable for private facilities only.

Joint uses such as recreational areas (i.e. parks, etc.) may be allowed on a case by case basis. Developers wishing to utilize an area for joint usage shall obtain approval from the city engineer prior to commencing development design.

(1) *General design requirements.*

- a. Detention facilities should be designed and constructed in such manner as to enhance the aesthetic quality of developments. Where practical the city encourages utilizing natural drainageways to provide detention volume.
 - b. Detention basins may be designed "wet" or "dry" and constructed of earth, concrete, concrete blocks, or combination thereof.
 - c. Parking lots may be utilized for detention storage provided the maximum depth does not exceed twelve (12) inches and seventy (70) percent of the lot remains accessible during the storm event.
 1. Location: Detention facilities shall be located within the parcel limits of the project under consideration with the following exceptions:
 - i. No detention or ponding will be permitted within public road rights-of-way without specific written approval of the city engineer.
 - ii. Location of detention facilities immediately downstream of the project will be considered by special request if proper documentation is submitted with reference to practicality, feasibility, proof of ownership or right-of-use of the area proposed, and provisions made for perpetual maintenance.
- (2) *Storage volume.*
- a. Detention storage volume shall be determined by hydrograph methodologies and reservoir routing techniques. Preferred methods for detention basin design include the Corps of Engineers' HEC-1 Flood Hydrograph Package and the Soil Conservation Service's TR-55 and TR-20.
 - b. Methods other than the ones listed above may be used provided the method is documented in generally accepted engineering literature and is used within the method limitations.
 - c. Runoff volumes shall be computed for both pre-developed and post-developed project conditions and shall be computed for each of the noted storm events. The outlet structure shall be designed to limit the runoff rate for each of the design storms to the pre-developed runoff rate. The storage volume shall be sufficient to contain the residual runoff from each storm event.
 - d. Routed hydrographs shall be completed for the 2-year, 10-year, 25-year, 50-year and 100-year storms events.
- (3) *Spillway (outlet structure).* The outlet structure shall consist of one (1) or more culverts, weirs, orifices or combinations thereof which will convey the peak outflow rates from the detention basin during each storm event. The outlet structure shall also be designed with sufficient capacity to release eighty (80) percent of the detention storage volume within twenty-four (24) hours after the peak inflow has entered the basin.
- (4) *Dry basins.* Dry detention basins shall be constructed to the following requirements:
- a. The limits of maximum ponding shall be no less than two (2) feet vertically below the lowest sill elevation and no closer than ten (10) feet horizontally from a building unless waterproofing of the building and pedestrian accessibility are properly documented.
 - b. Side slopes on the banks, dikes or berms shall be no greater than one-foot vertical for three (3) feet horizontal (three (3) to one (1)).
 - c. The bottom of the basin shall slope a minimum of one (1) percent to provide drainage across a grassed surface. The one (1) percent slope may be reduced to one-half of one (1) percent if a paved drainage channel is installed. The drainage

channel shall be a minimum of four (4) feet wide and shall be constructed of concrete or asphalt and shall have a minimum depth of two-tenths of a foot.

- d. The entire basin shall be seeded, fertilized and mulched, sodded or paved.
- (5) *Wet basins.* Wet basins shall be constructed similar to dry basins with the following exceptions and/or additional requirements:
 - a. The limits of maximum ponding shall be no less than two (2) feet vertically below the lowest sill elevation and no closer than thirty (30) feet horizontally from a building.
 - b. Maximum fluctuation from permanent pool elevation to maximum ponding elevation shall be three (3) feet.
 - c. The area above the permanent pool elevation shall be seeded, fertilized and mulched, sodded or paved.
 - d. The basin shall be completely drainable to permit sediment removal or other maintenance items to be completed.

Special consideration should be given to limiting accessibility and providing for the safety of small children in residential areas.

- (6) *Open channels.* Normally permitted open channels may be used as detention areas. Open channels shall conform to the requirements of dry basins with the following exceptions and/or additional requirements:
 - a. The limits of maximum ponding shall conform to the requirements of both wet and dry basins.
 - b. The maximum depth of detention shall not exceed four (4) feet.
 - c. The minimum flow line grade of the open channel may be one-half of one (1) percent within the limits of ponding.
- (7) *Parking lot detention.* Paved parking areas may be utilized as detention areas however the maximum ponding depth shall be limited to eighteen (18) inches. Open channels shall conform to the requirements of dry basins with the following exceptions and/or additional requirements:
 - a. The limits of maximum ponding shall conform to the requirements of both wet and dry basins.
 - b. The maximum depth of detention shall not exceed four (4) feet.
 - c. The minimum flow line grade of the open channel may be one-half of one (1) percent within the limits of ponding.

(Ord. No. 10-12, § I, 5-11-10)

Editor's note—

Ord. No. 10-12, § I, adopted May 11, 2010, repealed former § 24-207, and enacted a new § 24-207 as set out herein. Former § 24-207 pertained to control structures and derived from Ord. No. 6628, § I(G), July 26, 1994).

Sec. 24-207.1. - Energy dissipation.

Energy dissipation structures shall be placed at the discharge point of enclosed systems or detention basins when the design discharge velocity is greater than the following:

System Discharge Velocity (fps)	Receiving Channel Lining
4.0	Natural, unlined

5.0	Constructed, turf lined
7.0	Reinforced vegetation
12.0	Riprap or gabions
15.0	Concrete
15.0	Natural limestone

Dissipaters shall be designed in accordance with the requirements of the American Society of Civil Engineers.

Structures

- (1) *Pipes and pipe-arches (30"Ø and smaller):* Pipes and pipe-arches less than thirty (30) inches in diameter the energy dissipation structure shall be either:
 - a. Prefabricated end section with concrete or rock channel liner.
 - b. Concrete headwall with concrete or rock channel liner.
- (2) *Enclosed system (Qd < 100 cfs):* Enclosed system structures (pipes, pipe-arches, box culverts, etc.) having a design discharge of less than one hundred (100) cfs, shall be constructed with one (1) of the following:
 - a. Prefabricated end section with concrete or rock channel liner.
 - b. Concrete headwall followed by concrete or rock channel liner.
- (3) *Enclosed system (Qd ≥ 100 cfs):* Enclosed system structures (pipes, pipe-arches, box culverts, etc.) having a design discharge of at least one hundred (100) cfs shall be constructed with:
 - a. Concrete headwall with followed by concrete or rock channel liner.
- (4) *Channel lining:* Channel lining shall be required for a distance equal to five (5) times the diameter of the outlet pipe or box culvert width downstream from the headwall apron or flared end section and fifty (50) feet downstream from all energy dissipation structures. Acceptable lining materials include turf-mat reinforcement, rock ditch liner, gabions, concrete, and in-situ limestone.

The channel lining material shall be of the appropriate type, size, and material to adequately resist erosion forces of the structure discharge.

(Ord. No. 10-12, § 1, 5-11-10)

Sec. 24-207.2. - Tables.

TABLE 1

PRECIPITATION DATA

Precipitation data used for computing runoff rates and volumes for use in the design of stormwater management facilities in the City of Carthage are derived from data published by the National Weather Service (NWS). This data is summarized below.

RAINFALL DURATION AND DEPTH DATA						
Duration (Minutes)	2-year	5-year	10-year	25-year	50-year	100-year
5	5.40	6.48	7.23	8.40	9.30	10.20
10	4.42	5.34	6.00	6.97	7.71	8.46

15	3.75	4.53	5.10	5.91	6.55	7.20
20	3.32	4.04	4.56	5.32	5.91	6.51
25	3.00	3.78	4.17	4.89	5.44	5.99
30	2.72	3.38	3.84	4.52	5.03	5.56
35	2.51	3.13	3.57	4.20	4.70	5.18
40	2.32	2.91	3.32	3.92	4.39	4.84
45	2.16	2.71	3.11	3.68	4.11	4.54
50	2.01	2.52	2.91	3.44	3.85	4.26
55	1.88	2.39	2.74	3.23	3.62	4.02
60	1.80	2.40	2.80	3.20	3.75	4.00

RAINFALL DURATION AND DEPTH DATA						
Duration (Hours)	2-year	5-year	10-year	25-year	50-year	100-year
1	1.80	2.40	2.80	3.20	3.75	4.00
2	2.20	2.80	3.40	4.00	4.50	5.00
3	2.40	3.20	3.80	4.50	5.00	5.50
6	2.80	3.75	4.25	5.00	6.00	6.00
12	3.25	4.25	5.00	6.00	6.75	8.00
24	3.90	5.00	5.90	7.00	8.00	9.00

TABLE 2

SURFACE RUNOFF COEFFICIENTS

Surface Type	Runoff Coefficient
Tall grass, brush	0.15
Asphalt, concrete pavement	0.95
Roofs	0.98
Gravel, Crushed Stone	0.85
Lawns, pasture	
Flat (<2% slope)	0.15
Average (2–7% slope)	0.20
Steep (>7% slope)	0.30
Woods	0.10

Single-Family Residential Areas
(Zoning District A)

	Terrain		
	Flat	Average	Steep
Average lot size, ¼-acre	0.45	0.49	0.55
Average lot size, 1/3-acre	0.40	0.43	0.50
Average lot size, ½-acre	0.35	0.40	0.46
Average lot size, 1-acre	0.25	0.30	0.38

Average lot size, 3 acres	0.20	0.25	0.33
---------------------------	------	------	------

Other Development Areas

Usage	Runoff Coefficient	Zoning Districts
Duplex, patio homes	0.46	B
Multifamily	0.52	C-1, C
Office	0.70	O
Commercial	0.75	D, E, C-P
Industrial	0.80	F, G

TABLE 3

MANNING'S ROUGHNESS COEFFICIENTS ("n")

Open Channel

Lined

Gabions0.025

Concrete

Trowel finish0.013

Float finish0.015

Unfinished0.017

Concrete, bottom float finished, with sides of

Dressed stone0.017

Random stone0.020

Cement rubble or masonry0.025

Riprap0.030

Gravel bottom with sides of

Random stone0.023

Riprap0.030

Grass (sod)0.035

Unlined (excavated or dredged)

Earth, straight and uniform0.027

Earth, winding and sluggish0.035

Natural stream

Clean, straight0.030

With pools, sluggish reaches, underbrush0.100

Flood plains

Grass, no brush0.030

Some brush0.090

Street curbing0.014

Closed conduit

Reinforced concrete pipe (round and elliptical)0.025

Ductile iron pipe

Unlined0.013

Lined0.011

Corrugated metal pipe

22/3" × ½" annular corrugations (unpaved)0.024

22/3" × ½" annular corrugations (paved invert)0.021

3" × 1" annular corrugations (unpaved)0.027

3" × 1" annular corrugations (paved invert)0.023

Polyvinyl chloride pipe (PVC)0.010

High density polyethylene (HDPE)0.010

TABLE 4

INLET CAPACITIES

Maximum Width of Flow (feet)	Longitudinal Slope of Roadway (percent)	Inlet Capacity		
		Single	Double	Triple
4	0.5	0.45	N/A	N/A
4	1.0	0.62	0.64	N/A
4	1.5	0.69	0.79	N/A
4	2.0	0.73	0.91	N/A
4	2.5	0.76	1.01	N/A
4	3.0	0.77	1.11	1.11
4	3.5	0.79	1.18	1.20
4	4.0	0.80	1.23	1.28
6	0.5	0.79	0.81	N/A
6	1.0	0.94	1.15	N/A
6	1.5	1.00	1.41	1.41
6	2.0	1.03	1.58	1.62
6	2.5	1.06	1.69	1.82
6	3.0	1.07	1.76	1.99
6	3.5	1.09	1.82	2.15
6	4.0	1.09	1.86	2.26
10	0.5	1.50	2.18	2.20
10	1.0	1.61	2.67	3.10
10	1.5	1.65	2.87	3.61
10	2.0	1.67	2.98	3.89
10	2.5	1.69	3.05	4.07
10	3.0	1.70	3.10	4.20
10	3.5	1.70	3.14	4.30
10	4.0	1.71	3.17	4.70
12	0.5	1.85	3.00	3.31
12	1.0	1.94	3.40	4.35
12	1.5	1.97	3.57	4.76
12	2.0	1.99	3.66	4.99
12	2.5	2.00	3.72	5.14
12	3.0	2.01	3.77	5.25
12	3.5	2.02	3.80	5.33
12	4.0	2.02	3.83	5.40

Notes:

The above values are calculated per HEC-22 methods.

The above table includes only values for inlets located in continuous grade road roadway. Designers shall provide capacities for inlets located in sag or ponded areas.

(Ord. No. 10-12, § 1, 5-11-10)

Sec. 24-208. - Easements.

Two (2) types of easements shall be provided for stormwater detention.

- (1) *Access easement.* All detention reservoirs with the exception of parking lot and roof detention shall be enclosed by an access easement. The limits of the easement shall extend ten (10) feet beyond the maximum anticipated ponding area. The limits and designation of detention facilities shall be shown on the project plans of final plat.
- (2) *Drainage easement.* A minimum ten (10) feet wide drainage easement shall be provided within the reservoir area, connecting the tributary pipes and the discharge system, along the most direct possible routing of a piping system for possible future elimination of detention. The limits of the drainage easement shall be shown on the project plans of final plat.

(Ord. No. 6628, § 1 (H), 7-26-94)

Sec. 24-209. - Maintenance.

Detention facilities are to be built in conjunction with the storm sewer installation and/or grading. Since these facilities are intended to control increased runoff they must be fully operational soon after the clearing of the vegetation. Silt and debris connected with early construction shall be removed periodically from the detention area and control structure in order to maintain full storage capacity.

The responsibility of maintenance of the detention facilities in single lot development projects shall remain with the general contractor until final inspection of the development is performed and approved, and a legal occupancy permit is issued. After legal occupancy of the project, the maintenance of detention facilities shall be vested with the owner of the project.

If the owner fails to provide a reasonable degree of maintenance and the facilities become inoperative or ineffective, City of Carthage crews may perform remedial work and assess the trustees or owner for the cost of repair and maintenance.

Upon conceptual approval of the location and final approval of the design and construction of multi-lot residential development projects, the City of Carthage will accept the responsibility for the maintenance of the detention facilities. Drainage and access easements will be required giving the City of Carthage the authority to gain vehicular access to the facility from a public street.

(Ord. No. 6628, § 1 (I), 7-26-94; Ord. No. 97-50, § 1, 9-23-97)

Sec. 24-210. - Temporary detention.

It may be advantageous in some situations to delay the building of the permanent detention facilities until after the completion of the other improvements. In these situations temporary detention facilities must be provided. The permanent or temporary detention facilities must be constructed and be functional before proceeding with any other construction.

(Ord. No. 6628, § 1 (J), 7-26-94)

Sec. 24-211. - Off-site and regional detention concepts.

- (1) *Off-site detention.* Stormwater detention facilities designed and constructed off-site or outside the limits of the proposed development will be considered for approval. This approval is contingent upon documentation being furnished to verify that drainage easements have been obtained for the channel area from the proposed development to the detention facility and including the detention area. The drainage easements must clearly set out provisions for maintenance.
- a. Fees for offsite stormwater detention, for use of the city-owned detention facility, located in the Northwest corner of Lot 1, Block 2, Myers Park Subdivision #3, shall be paid to the city within ninety (90) days after issuance of the building permit by the engineering department. Use of said facility shall be subject to available capacity. Said fees shall be based on cubic feet of storage required for detention, as follows:

Number of cubic feet required	Fee per cubic foot
1 cu. ft.—9999 cu. ft.	\$0.90 per cu. ft.
10,000 cu. ft.—49,999 cu. ft.	0.75 per cu. ft.
50,000 cu. ft.—above	0.65 per cu. ft.

- (2) *Regional detention.* Detention facilities designed and located to provide detention on major drainage channels will be considered as a regional detention facility. The drainage area considered for a regional detention facility must be five hundred (500) acres or greater. The facility must provide a detention volume for a 100-year storm for the entire drainage area, and must be designed with a variable control outlet structure that has a one (1) year maximum outlet opening. The regional detention facility must be designed with a low flow concrete channel through the limits of the basin. Upon conceptual approval of the location and final approval of the design and construction, the City of Carthage will accept the responsibility for the maintenance of the regional facility. Drainage and access easements will be required giving the City of Carthage the authority to gain vehicular access to the facility from a public street.

As additional development occurs upstream of the regional facility, onsite detention requirements may be waived, provided the regional detention basin has been designed for full development of the basin, or if modifications are made to the regional facility by the developer to provide for the additional volume of detention required for the new development. Easements must be provided along the drainage channel from the new development to the regional facility and the channel must be constructed to carry the peak rate of runoff from the 100-year storm for the entire basin upstream from the regional facility.

Construction Requirements

1. Minimum time of concentration (tc) shall be five (5) minutes.
2. Volume of detention shall be that computed amount between the 100-year developed and 100-year undeveloped conditions.
3. Discharge structure shall be designed for one (1) year design storm with minimum size outlet being not less than a four (4) inch diameter pipe.

4. All outlet structures and detention walls shall be concrete.
5. Detention for any revision, upgrade or modification to an existing property shall be designed to accommodate any increase in stormwater runoff resulting from the modification being made.
6. Designers not wishing to show calculations may design detention at a rate of three thousand two hundred and forty (3,240) cubic feet per acre of total site.
7. Temporary retention during construction shall be provided.
8. Minimum detention required = five hundred (500) cubic feet.

(Ord. No. 6628, § 1 (K), 7-26-94; Ord. No. 00-76, § 1, 10-24-2000)

FOOTNOTE(S):

⁽⁸³⁾ **Editor's note**— Ord. No. 6628, adopted July 26, 1994, did not specifically amend this Code; hence, codification of § 1 (A—K) of said ordinance as §§ 24-201—24-211 was herein included at the editor's discretion. ([Back](#))



Public Works Department
602 S. Main Street
Joplin, MO 64801
(417) 624-0820 ext. 530
(417) 625-4738 (Fax)

January 24, 2013

All area **Small Municipal Separate Storm Sewer System (MS4) Permit** partners are cordially invited to attend the City of Joplin's

**Storm Water Pollution Prevention
Municipal Employee Training Session**
regarding
Illicit Discharge Detection and Elimination
on the following topics

- Spotting Illicit Discharges at the Source
- Spotting Illicit Discharges at Outfalls
- Evidence of Past Illicit Discharges
- Reporting Illicit Discharges

A professional presentation from Excal Visual will be used for this training. It is a digital video and is designed to be interactive. An acknowledgment of training certificate will be available to aid in your permit requirements. Every effort will be made to hold the session to under one hour.

Tuesday, February 26 ~ 7:30 AM
Joplin Parks & Recreation Office, 3010 West First Street (West of Schifferdecker Avenue)

Wednesday, February 27 ~ 7:30 AM
Joplin Public Works Center Office, 1301 West Second Street (East of Maiden Lane)

Thursday, February 28 ~ 3:00 PM
Joplin City Hall, Basement Conference Room, 602 South Main Street

For additional information, contact Dan Johnson, at Extension 538, or me at Extension 501.

Sincerely,

A handwritten signature in cursive script that reads "Mary Anne Phillips".

Mary Anne Phillips
Recycling Coordinator &
Storm Water Education Manager
MPhillip@joplinmo.org
417-624-0820 Extension 501

IDDE a grate concern	Illicit	Acknowledgment of Training
	Discharge	
	Detection	
	Elimination	

I, the undersigned, acknowledge that on February 27, 2013

I attended a hour long training session at the
Joplin Public Works Center, 1301 West Second Street, Joplin, Missouri

TRAINER:
Mary Anne Phillips 
City of Joplin Recycling Coordinator and Storm Water Education Manager

This training session presented information on illicit discharge detection and elimination. During the session, I viewed the visual multimedia program titled

“IDDE a grate concern.”

I was given adequate time to ask questions about my particular job activities and how I can best conduct these activities in compliance with the applicable regulations.


Signature of Participant

CITY OF CARTHAGE / PUBLIC WORKS
Affiliation/Department/Organization



IDDE a grate concern	Illicit Discharge Detection Elimination	Acknowledgment of Training
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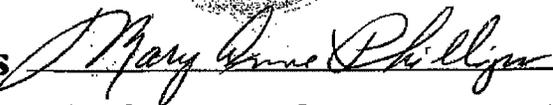
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TRAINER:

Mary Anne Phillips

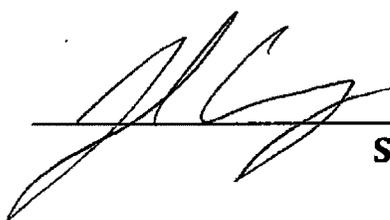


City of Joplin Recycling Coordinator and Storm Water Education Manager

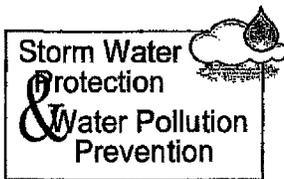
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Signature of Participant



CITY OF CARTHAGE / PUBLIC WORKS
Affiliation/Department/Organization

IDDE
a grate concern

**Illicit
Discharge
Detection
Elimination**

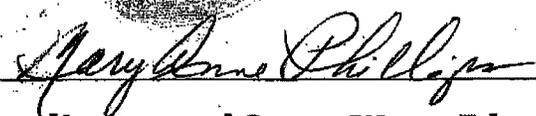
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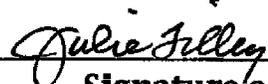
Mary Anne Phillips 

City of Joplin Recycling Coordinator and Storm Water Education Manager

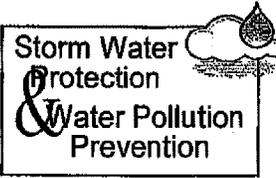
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Signature of Participant



CITY OF CARTHAGE / PUBLIC WORKS
Affiliation/Department/Organization

IDDE
a grate concern

**Illicit
Discharge
Detection
Elimination** Acknowledgment
of Training

I, the undersigned, acknowledge that on February 28, 2013

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Joplin City Hall, 602 South Main Street, Joplin, Missouri

TRAINER:

Mary Anne Phillips *Mary Anne Phillips*

City of Joplin Recycling Coordinator and Storm Water Education Manager

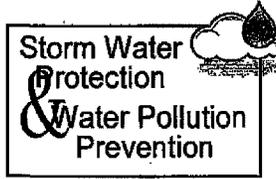
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John Shelley
Signature of Participant

Public Works - City of Carthage
Affiliation/Department/Organization



IDDE a grate concern	Illicit Discharge Detection Elimination	Acknowledgment of Training
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CITY OF
Joplin City Hall, 602 South Main Street, Joplin, Missouri

TRAINER:

Mary Anne Phillips *Mary Anne Phillips*
 City of Joplin Recycling Coordinator and Storm Water Education Manager

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Bob Sandiford

Signature of Participant



CITY OF JOPLIN, STREET DEPT.
Affiliation/Department/Organization

IDDE

a grate concern

Illicit

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Detection

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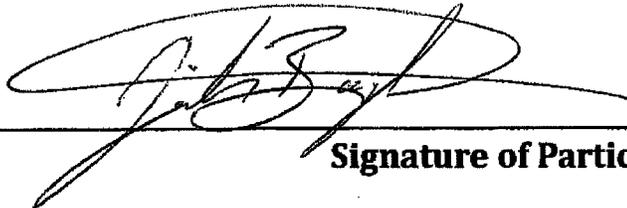


City of Joplin Recycling Coordinator and Storm Water Education Manager

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Signature of Participant

Storm Water
Protection
& Water Pollution
Prevention



CITY OF CAETHAGE, STREET DEPT.
Affiliation/Department/Organization

IDDE
a grate concern

**Illicit
Discharge
Detection
Elimination**

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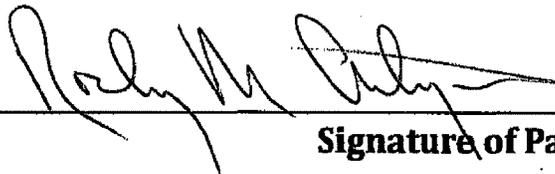
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Signature of Participant



Affiliation/Department/Organization





Frequently Asked Questions

- Can I dispose of old mattresses, box springs or furniture at the Recycling Center?

Yes, there is a disposal fee for each item.

- Does the Recycling Center accept demolition and construction waste?

Yes, there is a disposal fee. The fee is based on the load size.

- Can I bring brush, branches or tree limbs to the Recycling Center?

Yes, there is a disposal fee.

Note: There is **not** a fee for leaves or grass clippings.

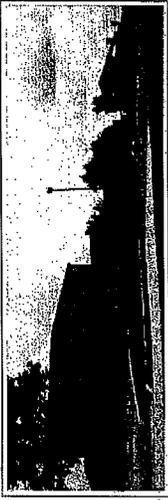
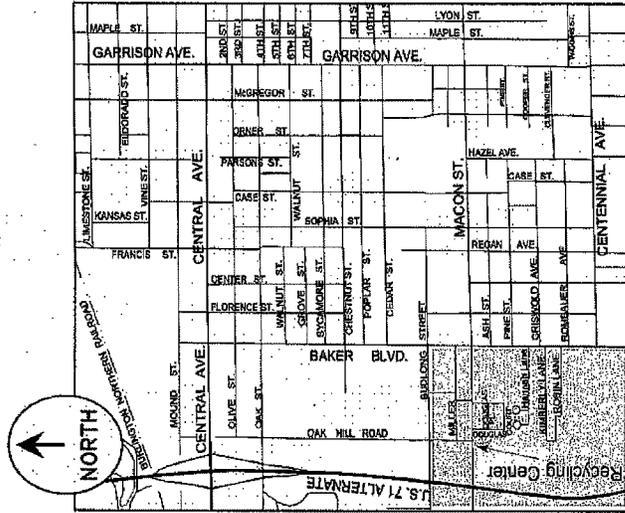
- Can I bring old electronics, microwaves, televisions, monitors or computer equipment to the Recycling Center?

Yes, E-Waste is accepted. There is a disposal fee for TV's, microwaves and monitors.

If you have a question about a certain item or fee, please call the Recycling Center at (417) 237-7024 or the Public Works Department at (417) 237-7010.

Where is the Recycling Center?

The Recycling Center is located at:
1309 Oak Hill Road



Carthage Recycling Center



Recycling Center

1309 Oak Hill Road
Carthage, MO 64836

Hours of Operation:
Tuesday - Saturday
8:30 - 4:30

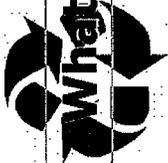
(417) 237-7024

For more information contact:

Public Works Department
623 E. Seventh
Carthage, MO 64836

Phone: (417) 237-7010
Fax: (417) 237-7011

www.carthage-mo.gov



What can be recycled?

The **Carthage Recycling Center** has been in operation since 1998 and is continually updating its facility and operations in order to better serve the community.

The facility strives to maintain a 'user-friendly' environment that enables businesses and families alike a convenient and efficient way to drop-off their recyclables.

Recycling plays an important role in reducing the waste taken to landfills and the negative impact of that waste on the environment.

Come out and see what we are doing at the **Carthage Recycling Center** for you and for our future!

Why Recycle?

- Recycling conserves natural resources
- Recycling saves energy
- Recycling saves clean air and clean water
- Recycling saves landfill space
- Recycling can save money and create jobs

Printed on 100% Recycled Paper

The **Carthage Recycling Center** accepts a variety of materials for recycling. Materials must be separated and placed in the appropriate container.

Tin, Aluminum Cans & Plastic

All metal food cans, beer and soda cans. All #1 and #2 plastic containers such as milk, soda, detergent, water bottles, etc. All lids are to be removed.

All cans and containers shall have no food residue. All foil containers, aluminum foil products, paint cans, solvent or pesticide containers are not acceptable.

Glass

Glass bottles that are brown, green, blue or clear are acceptable.

Plate glass, vehicle glass, safety tempered glass or stained glass is not acceptable. No Pyrex or dinnerware.

All bottles are to be rinsed well and the lids removed. Labels are ok to leave on.

Cardboard

Only corrugated boxes, beer and soda flats, paper grocery bags, cereal boxes. (No wax or plastic covered cardboard)

All cardboard materials are to be clean, dry, flattened in size and no more than 48" X 48".

Newsprint/Office Paper

All types of newsprint, inserts, magazines, catalogs, junk mail, envelopes, fax paper, blue prints are all acceptable.

All materials should be clean, dry and with no food contamination.



Region M
Solid Waste
Management District



For more information please contact **The Recycling Center** at (417) 237-7024 or **The Public Works Department** at (417) 237-7010.



HELP CARTHAGE GO GREEN!

- Recycling helps reduce water and air pollution.
- Recycling one aluminum can saves enough energy to run a 100 watt bulb for 20 hours, a computer for 3 hours, or a TV for 2 hours.
- Recycling 1 ton of paper saves: over 15 mature trees, 6,953 gallons of water, 464 gallons of oil, and 4,077 Kilowatt hours of energy
- Plastic water bottles can be recycled to make t-shirts, sweaters, socks, and carpet.

 Printed on 100% Recycled Paper

CARTHAGE RECYCLING & COMPOSTING CENTER

1309 Oak Hill Road
Carthage, MO 64836

HOURS

Tuesday - Saturday
8:30 a.m. — 4:30 p.m.

MATERIALS ACCEPTED

- Corrugated Boxes
- Newspaper
- Magazines
- Catalogs
- Phone books
- Junk Mail
- Tin & Aluminum Cans
- #1 Plastic (no lids)
- #2 Plastic (no lids)
- Office Paper

FOR MORE INFORMATION CONTACT:

Diane Showalter
417-237-7010

EMAIL:

pwdept@carthage.com

Funding Provided In Part By:



Region M
Solid Waste
Management District



Missouri
Department of
Natural Resources

 Printed on 100% Recycled Paper

JOPLIN RECYCLING CENTER 1310 West A Street

Corner of A Street and Porter Avenue,
North Side of Park Works Center

⇒ Items accepted **ONLY** when center is open

⇒ Arrangement will be on duty

⇒ Open to everyone regardless of residency

Tuesday and Thursday 2 PM to 6 PM
Wednesday, Friday and Saturday 9 AM to 1 PM

Items accepted for recycling or reuse:

- ◇ Corrugated Cardboard & Paperboard
- ◇ Newspapers (with inserts)
- ◇ Magazines, Catalogs, Telephone Directories, Books, Junk Mail, Office Paper
- ◇ Plastic #1 & #2 Bottles with Necks (remove lids)
- ◇ Glass Bottles, Jugs, Jars (remove lids)
- ◇ Aluminum Cans and Tin/Steel Cans, All Metal
- ◇ #2 Plastic Shopping Bags
- ◇ Clean Packing Peanuts, Bubble Wrap
- ◇ Ink Jet & Toner Cartridges
- ◇ Electronic Waste (computers, televisions, etc.)
- ◇ All Batteries

(Limited) Household Hazardous Waste including:

- ◇ Insecticides, Herbicides, Acids, Mercury,
- ◇ Home Maintenance Products, Lubricants,
- ◇ Pool/Spa Chemicals, Cleaning Products, and more

Refer to "Paint" or "Motor Oil" in this Guide
for Proper Disposal

The HHW portion is open only to residents of
McDonald, Newton, Jasper, Barton
and Vernon Counties.

Commercial Hazardous Waste IS NOT accepted.

Center Closed:

July 4, November 28 & 29, December 25, 2013, and January 1, 2014

2013 Recycling & Waste Disposal Guide



Residential Postal Customer

All Information Subject to Change Without Notice
View updates to this guide at www.joplinmo.org

Free Self-Serve Document Shredding at Recycling Center

City of Joplin Recycling Department
417-624-0820 Extension 501
www.joplinmo.org

PRSR1, STD.
U.S. POSTAGE
PAID
JOPLIN, MO
PERMIT NO. 187

City of Joplin
602 South Main Street
Joplin, MO 64801

JOPLIN RESIDENTIAL TRASH SERVICE Uses AUTOMATED TRUCKS & POLYCARTS

◇ The City manages residential trash service through **Republic Services** (formerly Allied Waste Services) **800-431-1507** for every dwelling unit that has an "activated" water meter and are inside the Joplin city limits. If the water is turned on but the living unit is unoccupied, a trash fee will still be charged.

◇ A **FREE 96 or 65 gallon (blue) polycart** is provided by Republic Services. Carts remain the property of Republic, and shall stay with the house; do not take the cart with you when you move. If your house does not have one, or you need more information, please contact Republic. All trash must be contained in the cart so that the lid is closed. Any extra trash must be properly containerized and placed next to the cart. An additional cart will be provided to those Republic deems as having extra trash each week, at no additional charge.

◇ **Placement of Polycart** is very important, since the collection vehicle's lifting arm requires clearance---3 feet on both sides and 12 feet overhead. For placement details contact Allied Waste or visit their website at www.disposal.com.

◇ The charge for trash is **\$11.91 (Trash Fee = \$11.36 plus Administration Fee = \$.55)** This monthly charge is on your utility bill generated by the City of Joplin.

◇ To learn which day your house is **scheduled** for weekly trash service, call Republic Services.

◇ Trash collection starts at **6:00 AM**. Place polycart at the curb/alley no earlier than 12 hours before collection day and please remove cart within 12 hours after collection.



Residential Trash Customers may haul **BRUSH, TREE LIMBS and BULKY ITEMS**

to **Republic Services Transfer Station**
1715 East Front Street in Galena, Kansas (Old Route 66)

Monday through Thursday from

8:00 AM to 11:30 AM & 12 Noon to 3:00 PM

and Saturday 8:00 AM to 2:00 PM

620-783-5841

Call ahead to inquire about acceptable and non-acceptable items, holiday schedules and rules.

Persons with a City of Joplin residential utility bill (sewer and trash) or a landlord with a residential trash dumpster rental bill from Republic Services and matching identification may bring acceptable items to the transfer station for a subsidized fee.

THE TRANSFER STATION WILL NOT ACCEPT:

Liquids/Chemicals **Appliances**
Hazardous Materials **Over 5 Tires**
Regular Weekly Trash **Commercial Waste**
Leaves/Grass Clippings **Lead Acid Batteries**

- ◇ Check the Household Hazardous Waste Facility section in this guide for Liquids/Chemicals disposal
- ◇ Take Leaves/Grass Clippings to Joplin Compost Facility, 6457 Eddy Lane

FEES at the Transfer Station (Subject to Change April 1, 2014)

- Bulky Items in Automobile, Truck or
≤ 8 foot trailer = \$6.53
- Bulky Items in Automobile, Truck or
> 8 foot trailer = \$9.80
- Tree Limbs/Brush only or mixed with Bulky Items in
Automobile, Truck or ≤ 8 foot trailer = \$13.06
- Tree Limbs/Brush only or mixed with Bulky Items in
Automobile, Truck or > 8 foot trailer = \$19.60
- Up to 5 Tires per trip, per vehicle = \$1.97 each
- Anything over 1 ton = gate price per trip

◇ **Physically Impaired** residents may call the City at 624-0820 Ext. 501 to arrange for door service and a smaller 65 gallon polycart.

◇ **Landlords with rentals** may call Republic Services to rent a dumpster instead of using the free polycarts.

◇ Trash will be picked up a day late (using Saturday to catch up) on the following **holidays, unless the holiday falls on a weekend**: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas.

◇ **Extreme Weather** can also affect the trash schedule.

◇ **Put Needles, Syringes and Lancets** in a thick plastic bottle (or red biohazard container specifically designed for sharps) with a solution of bleach and water; reseal bottle; when container is nearly full, carefully pour all liquid into toilet; reseal bottle and wrap with tape; write "Sharps" on the bottle; place in polycart.

◇ **Bulky Items** can also be set out with regular weekly trash including furniture, mattresses, televisions, solid old paint, tree limbs and brush bundled & cut to 4 foot maximum lengths, microwave ovens, non-banned large items, dry carpet bundled to 50 pounds maximum, 4 feet maximum and small amounts of bundled or containerized construction/demolition debris. **Customers must call Republic Services to schedule the bulky item pickup.** This is very important, as a different refuse truck will service bulky items. Items must not obstruct the polycart.

◇ **Non-Acceptable Bulky Items**: Oils, appliances, railroad ties, liquid paint, lead acid batteries, tires, commercial waste and large amounts of construction/demolition debris.

HOUSEHOLD HAZARDOUS WASTE & WASTE ELECTRONICS

See Recycling Center section of this guide for details

funded in part by and managed by



JOPLIN
CITY OF MISSOURI

Missouri Department of Natural Resources

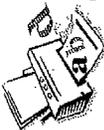
Prescription Drugs and Over-the-Counter Medicines



Joplin Police Stations:

303 East 3rd Street ~ 8 AM to Midnight ~ Monday-Friday
115 East 34th Street ~ 8 AM to 5 PM ~ Monday-Friday

INK JET & TONER CARTRIDGES



Cartridge World - 102 N. Range Line Road 206-3455
DC Trading Company 434-6833
LaserEquipment - 1012 South Illinois Avenue 782-8444
Joplin Recycling Center - 1310 West A St. 624-0820

LEAF PICKUP PROGRAM

No Brush, Limbs, Rocks or Bags
The City of Joplin Street and Park Departments collect leaves from Joplin residential streets. The Fall Leaf Collection normally begins the first Monday following Thanksgiving Day each year. Rake leaves to the curb, not into the street. Call the Recycling Dept. for more information 624-0820 Ext 501.

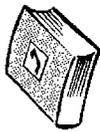
(Note: Refer to "Grass" and "Composting" sections in this guide for more information.)

METAL



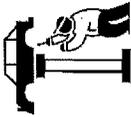
Aluminum - Brass - Copper - Steel
Lead - Zinc - Tin - Nickel
Missouri Metal Recycling-Webb City (redeems) 673-3232
CMC Recycling - 12th & Iowa (redeems) 781-7560
USA Metal Recycling-2002 W. 7 St. (redeems) 623-4500
Joplin Recycling Center - 1310 West A Street
(does not redeem) 624-0820 Ext 501

**MAGAZINES ~ BOOKS
JUNK MAIL ~ CATALOGS
OFFICE PAPER
TELEPHONE DIRECTORIES**



Joplin Recycling Center-1310 W. A St. 624-0820 X 501
KODE TV - 1928 W. 13 Street (Junge Blvd. & Adele Ave.) 625-0700
Paper-Pal Containers

(Used) MOTOR OIL & TRANSMISSION FLUID



Restrictions apply, call ahead. Empty containers not accepted. Do not mix anything with the lubricants.

Lube-N-Oil - 906 West 7 Street 623-5823
Mitchell's Mobil 1 - 2525 S. Range Line Rd. 206-7755
Above recyclers also accept used oil filters & power steering fluid

All Locations: Wal-Mart-O'Reilly Auto Parts-AutoZone
Joplin HHW Facility accepts only contaminated oil.
Call ahead for details, 624-0820 Extension 501

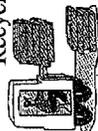
NEWSPAPERS



Must be dry and loose. No plastic bags.

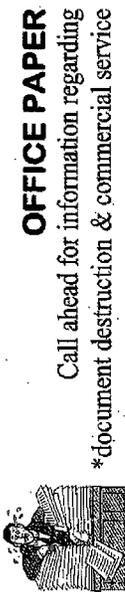
Joplin Waste Paper - 3178 N. Kentucky 624-9779
Joplin Recycling Center-1310 W. A St. 624-0820 X 501
Fiberlite Technologies - 3605 E. 25 St. 781-6380
KODE TV - 1928 W. 13 Street (Junge Blvd. & Adele Ave.) 625-0700
Paper-Pal Containers

PAINT Once latex paint has solidified, it can be discarded in the trash. To solidify, place cat litter or sawdust in can, stir and leave lid off to dry. Keep lids off for disposal. Free sawdust is available at the Joplin Recycling Center, 1310 W. A St.
Recycling Center is NOT able to accept Paint.



PALLETS

Joplin Waste Paper - 3178 N. Kentucky Ave. 624-9779
(JWP also sells landscape mulch in bags and bulk)
Service Recycling - 1015 S. Illinois Ave. 625-0700
Triple R Recycling - 510 S. Tyler Ave. 782-7121



OFFICE PAPER

Call ahead for information regarding *document destruction & commercial service

*Fiberlite Technologies - 3605 E. 25 St. 781-6380
*Midwest Fibre Sales 800-825-1976
Joplin Waste Paper - 3178 N. Kentucky 624-9779
*Cintas Document Management 417-885-1101
*Shred-it 417-865-5105
Paper Pal Containers 625-0700

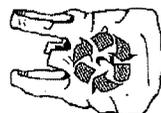
FREE self-serve shredder available at
*Joplin Recycling Center - 1310 West A Street
624-0820 Ext. 501



#1 and #2 PLASTIC BOTTLES with NECKS (remove lids & rinse)

The number on the bottom of any plastic container only indicates its plastic resin code. There are two processes for forming plastic containers - blow molding and injection molding. In a **blow molded** process the plastic is blown into a particular shape, like a **bottle**, whereas in the **injection mold** process the plastic resin is injected into a mold that forms a particular shape, like a **butter tub**. The resins from a milk jug and a butter tub might be the same but the different processes use different chemicals that require different temperatures to melt the resins and therefore must be separated when recycled. Because there is no regional market for the injection molded plastics or other numbers, the **Recycling Center can only accept #1 and #2 blow molded plastic bottles whose neck is smaller than the base of the bottle**. Bottles that held toxins (drain cleaner, automotive fluids, etc.) will NOT be accepted. To dispose of toxins, see flip side of this brochure under Recycling Center Household Hazardous Waste category.

Joplin Recycling Center-1310 W. A St. 624-0820 X 501



2 PLASTIC SHOPPING BAGS

Wal-Mart & Price Cutter
Joplin Recycling Center - 1310 W. A Street
624-0820 Ext 501



ANTIFREEZE (5 Gal. Max. per person)
 Check with your local service station
 Lube-N-Oil - 906 West 7 Street 623-5823
 Mitchell's Mobil 1- 2525 S. Range Line Rd. 206-7755



APPLIANCES & COMPRESSORS
 can be recycled, but compressors must be removed (& Freon evacuated) before delivery to a scrap metal facility. Call companies listed below for details.

CMC Recycling - 12th & Iowa 781-7560
 Missouri Metal Recycling - Webb City 673-3232
 USA Metal Recycling - 2002 W 7 St. 623-4500

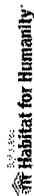


--- LEAD ACID BATTERIES ---
 such as Auto-Truck-Marine-Motorcycle-Wheelchair
 (some locations will redeem batteries)

CMC Recycling - 12th & Iowa 781-7560
 Missouri Metal Recycling - Webb City 673-3232
 Interstate Batteries - 3702 E. 20 Street 623-5665
 Battery Outfitters - 3431 East 7 Street 624-2421
 USA Metal Recycling - 2002 W 7 Street 623-4500



ALL BATTERIES
 Joplin Recycling Center - 1310 West A Street
 624-0820 Ext. 501



Restore BUILDING MATERIALS
 and usable
 FURNITURE & APPLIANCES

315 South Black Cat Road, Joplin - 782-7467
 Open Tuesday through Saturday - 9 AM to 4 PM

ACCEPTS donations of new and used building materials and surplus supplies from contractors, individuals and retail chains, then sells to individuals at a fraction of the original cost. Call ahead for "pick up" details.

JOPLIN 22 Government Access Channel
 on the City's Cable Television Provider
CABLE ONE
 Broadcasts Updated City Programs and Services



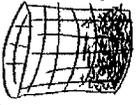
(Natural) CHRISTMAS TREES
 December 26 to January 31
 Drop-off Points: Humphrey Park, McIndoe Park,
 Public Works Center 1301 West 2 Street



**CORRUGATED CARDBOARD
 & PAPERBOARD**
 commercial and residential
 Midwest Fibre 800-825-1976
 Joplin Waste Paper - 3178 N. Kentucky 624-9779
 Joplin Recycling Center - 1310 W. A St. 624-0820 X 501
 Service Recycling - 1015 Illinois 625-0700
 KODE TV-1928 W. 13 Street (Junge Blvd. & Adele Ave.)



COMMERCIAL TRASH HAULERS
 Republic Services 800-431-1507 or 620-783-5841
 B-3 Construction 620-479-2323
 C & R Disposal 417-642-5842
 C.D.R., LLC 417-317-4817
 Cupps Trash Service 624-4440
 Deffenbaugh Industries 623-0854
 Jordan Disposal 624-4444
 Reliable Rolloffs 417-358-4440
 Waste Corporation 623-6620
 Wright's Disposal 417-255-8449



COMPOSTING
 Mix together grass clippings, leaves, non-dairy/meat food scraps in a backyard compost bin. Harvest finished compost from the bottom. Call Joplin Recycling Dept. 624-0820 Ext. 501 for instruction guide.



COMPUTERS & ELECTRONICS
 Computer Trade - 820 South Minnesota Ave.
 (417) 770-6933

Joplin Recycling Center-1310 W A St. 624-0820 X 501



CONSTRUCTION & DEMOLITION DEBRIS
 (Shingles, Sheetrock, Wood, Concrete)
 On-site dumpsters available through commercial trash haulers listed in this guide.
Drop-off disposal locations listed below:

B-3 Construction Landfill-Scammon, Ks. 620-479-2323
 City of Galena Landfill - Old Route 66 624-4444
 Waste Corp.- 3700 West 7 Street 623-6620
 Republic Services - Old Route 66, Galena, Ks. 800-431-1507
 Swift Construction (asphalt roofing shingles only) 417-451-4313
 across from 7429 Newman Road plant 417-451-4313
 Blevins Asphalt (asphalt roofing shingles only) 417-466-3758
 10575 Civil War Ave, Carthage



GLASS
ONLY: Bottles, Jugs & Jars
 Metal lids are recyclable~Plastic lids are trash
 Joplin Recycle Center - 1310 West A Street
 624-0820 Ext. 501



GRASS CLIPPINGS & LEAVES
 (Limbs, Brush, Bags NOT Permitted)
 Bring directly to Joplin Compost Facility west of Turkey Creek Waste Water Treatment Plant-Take North Schifferdecker Avenue to North Peace Church Avenue then west to 6457 Eddy Lane
OPEN ALL YEAR...24 HOURS A DAY



Recycling Department
602 South Main Street
Joplin, Missouri 64801
(417) 624-0820 Extension 501
(417) 625-4738 Facsimile
MPhillip@joplinmo.org
www.joplinmo.org

Greetings 2012 Storm Water Partners:

Please find enclosed a spreadsheet outlining public education and involvement activities (plus documentation) for Joplin and the region for the calendar year of 2012.

The Rain Barrel Kit partnership continues at Habitat for Humanity ReStore and is available to regional customers.

A general public education storm water brochure and a household hazardous waste brochure is disseminated throughout the metropolitan area in different venues such as the Joplin Library, Joplin City Hall, Joplin Recycling Center, Home Builders Association Home Show, Earth Day events, Nature Center events and many others. The annual "2012 Recycling and Waste Guide" was disseminated in the same manner plus mailed to 20,511 Joplin area households. Because the guides are "bulk mailed," some household outside of the city limits (64804: Leawood, Saginaw, Shoal Cliff Village, Shoal Creek Estates; 64801: Duenweg and the New Addition, and more) receive the guide. It informs all people (regardless of residency) as to where they can recycle or properly dispose of motor oil, antifreeze, household hazardous waste, Freon, etc.

Our Household Hazardous Waste (HHW) Collection Facility continues to take in chemicals, mercury debris, all types of batteries including lead acid, acids, cylinders, fuels, insecticides, pesticides, herbicides, fertilizers, contaminated fuels, lubricants plus the ever popular "unknown". By collecting these unwanted items from our residents, we protect the landfills, trash collection employees and of course our surface and ground water. The 2012 log sheets reflect mostly residents from Joplin, but residents from Carthage, Racine, Cartersville, Nevada, Carl Junction, and Webb City, plus rural Jasper and Newton County also took advantage of this free service, plus a fair amount of residents denoted as "unknown." Because Region M Solid Waste Management District grants pay the cost of the contractor, the City's policy is to allow all residents from McDonald, Newton, Jasper, Barton and Vernon Counties to drop off HHW. Should the City be unable to receive grant funding in the future, a policy change may be implemented.

While I always include Phase II language in all public service announcements, the media does not always print/air it.

The City's web site (www.joplinmo.org/publicworks/stormwater) is available to all residents and contractors.

Four-state area contractors are given documents regarding erosion and sediment control BMPs and regulations when they apply for a Joplin building permit.

Sincerely,

A handwritten signature in cursive script that reads "Mary Anne Phillips".

Mary Anne Phillips

Recycling Coordinator and Storm Water Education Manager

STORM WATER Joplin Regional Education

January 1, 2012 - December 31, 2012

IMPRESSIONS or CIRCULATION or

AUDIENCE QTY or

POSSIBLE

VIEWERS

LOCATION

AUDIENCE

VOLUNTEERS/CITY STAFF

SOURCES

***TARGETED**

POLLUTANT

x HOURLY RATE

STAFF TIME

HOURS OF

TOTAL COST

TO THE CITY

Year 2012	MEDIA OR EVENT	LOCATION	POSSIBLE VIEWERS	VOLUNTEERS/CITY STAFF	SOURCES	*TARGETED POLLUTANT	x HOURLY RATE	STAFF TIME	HOURS OF	TOTAL COST
All Year	Permanent Sign at Joplin City Hall	Joplin	?	Mary Anne Phillips	ALL		2 @ 34.50	2	@ 34.50	69.00
All Year	Permanent Signs at HHW Facility	Regional attendance	?	Mary Anne Phillips	ALL		2 @ 34.50	2	@ 34.50	69.00
All Year	Permanent Signs at Nature Center	Regional attendance	?	Mary Anne Phillips	ALL		2 @ 34.50	2	@ 34.50	69.00
All Year	Storm Water brochure mailed to new business licensees	Joplin	approx. 240	Mary Anne Phillips	ALL		12 @ 34.50	12	@ 34.50	414.00
Jan 6	Photograph and article in Joplin Globe newspaper	Regional readership	28,414	Mary Anne Phillips	T		1 @ 34.50	1	@ 34.50	34.50
Jan	The Current Etc. magazine	Regional readership	3,500	Mary Anne Phillips	LG		1 @ 34.50	1	@ 34.50	34.50
Feb 23-26	HBA Home Show at Hammons Trade Center	Regional attendance		M A Phillips & Steve Cope	ALL		30 @ 34.50 & 10 @ 36.40	30	@ 34.50 & 10 @ 36.40	1,399.00
May	2012 Waste/Recycling Guide mailed to resi postal customers	Regional attendance		Mary Anne Phillips	ALL		4 @ 34.50	4	@ 34.50	138.00
Feb 28-29	DNR Workshop in Columbia	Joplin	20,511	Mary Anne Phillips	Administrative		16 @ 34.50	16	@ 34.50	552.00
March 14	Girl Scout troop	St. Mary's Elem School	15	Mary Anne Phillips	ALL		2 @ 34.50	2	@ 34.50	69.00
April 30	Live TV Show on KSM for Barrel/Bin sale	Regional audience		Mary Anne Phillips	LG		1 @ 34.50	1	@ 34.50	34.50
April 11	Green Infrastructure DNR Workshop-Joplin City Hall	Regional audience		Mary Anne Phillips	PC		16 @ 34.50	16	@ 34.50	552.00
April 19	Rain Barrel and Compost Bin demonstration at downtown Joplin's "Third Thursday"	Regional audience	1,000	Mary Anne Phillips	LG		4 @ 34.50	4	@ 34.50	138.00
May	Newsletters TV show about Rain Barrel and Compost Bin Truckload Sale - aired on KOAM, KGCS and KOZJ TV stations several times	Regional audience		Mary Anne Phillips	LG		1 @ 34.50	1	@ 34.50	34.50
May 8 & 15	Storm Drain Stenciling with Joplin School Sixth Graders	Joplin	200	Chris Pistole (Volunteer) & Phillips	I, LG, T		(24 Volunteer) 12 @ 34.50	12	@ 34.50	414.00
May 31 & June 2	KOAM/FOX TV 30-sec. PSAs for Rain Barrel sale	Regional audience	aired 42 times	Mary Anne Phillips			1 @ 34.50	1	@ 34.50	34.50
June 2	Sold Compost Bins and Rain Barrels	Regional customers	sold 588 units	Mary Anne Phillips	LG		20 @ 34.50	20	@ 34.50	690.00
July 19	Enviroscape Model at Downtown "Third Thursday"	Regional audience	40 people	Willy Crane (Volunteer)			(5 Volunteer hours)			
July 25	Greentown/Joplin meeting re: storm water protection	Regional audience	30	Chris Pistole (Volunteer) & Phillips	PC & T		(4 Volunteer) 2 @ 34.50	2	@ 34.50	69.00
August 6	City Council approved Comprehensive Plan 2012	Joplin	?	Dan Johnson/Troy Bolander	LG & PC		4 @ 34.31 & 37.44	4	@ 34.31 & 37.44	287.00
August 11	Water Festival at Wildcat Glades Nature Center	Regional audience	2,000	Mary Anne Phillips	I, LG, PC, T		7 @ 34.50	7	@ 34.50	241.50
August 16	Compost Bin demo at downtown "Third Thursday"	Regional audience	?	Mary Anne Phillips	LG		4 @ 34.50	4	@ 34.50	138.00
August 26	Shoal Creek cleanup-City recycled the tires	Regional audience	?	Waters Edge Campground & Phillips	T		(8 Volunteer) 2 @ 34.50	2	@ 34.50	69.00
October	The Current Etc. magazine	Regional readership	3,500	Mary Anne Phillips	ALL		1 @ 34.50	1	@ 34.50	34.50
October 29	CART (Tornado Recovery) Public Meeting	Joplin		Mary Anne Phillips	SRC, PC, T		1 @ 34.50	1	@ 34.50	34.50
October 30	DNR Permit/Application Training Workshop			MA Phillips, S Cope, D Johnson	Administrative		4 @ 34.50 & 36.40 & 34.31	4	@ 34.50 & 36.40 & 34.31	420.84
TOTALS (41 Vol.) 174 Staff Hours										\$6,039.84

*TARGETED POLLUTANT SOURCE CODE:

Soil & Erosion Control-Construction Activities = SRC

Post Construction Activities = PC

Municipal Operation = MO

Lawn & Garden Activities = LG

Trash/Litter Reduction &/or Clean Up = T

Illicit Discharge = I

All of the Above = ALL

DISPOSAL OF LEAVES AND GRASS CLIPPINGS

Some City services have been adjusted following the Joplin tornado, including the availability of the leaves and grass collection bins at the Public Works Center. These bins have been temporarily removed until further notice. In the meantime, residents may bring their leaves and grass clippings directly to the Joplin Compost Facility next to the Turkey Creek Waste Water Treatment Plant at 6937 Eddy Lane. The facility is open all day, every day. Directions from Joplin: Go north on Schifferdecker Avenue, until you reach a "T" at North Peace Church Avenue and Zora, just north of Turkey Creek; turn left on Peace Church; then take the first left, which is Eddy Lane. The compost facility is located on the left side of the road before the treatment plant. An alternative to leaf/grass disposal is home composting. To create compost simply put leaves, grass, and

meat-free kitchen scraps in your compost bin, and keep it moist. Stirring the mixture will speed up the decomposition process, and then harvest the finished compost from the bottom of the bin. Finished compost should be available in approximately two seasons and produces a free organic fertilizer. Mary Anne Phillips, the City's Recycling Coordinator, encourages the use of compost instead of non-organic fertilizers and chemicals on lawns and gardens. Compost can be tilled into the soil, thus making the plants healthy and less susceptible to diseases and insects, which will reduce the need for chemicals. Run off of chemical-based fertilizers and pesticides can harm bodies of water. The easiest alternative to leaf disposal is to rake the leaves onto the lawn and run over them with a mulching lawnmower. Less eco-friendly alternatives include

setting out bagged leaves/grass for the regular weekly trash service of burning the leaves. In order to burn, citizens need to obtain a Burn Permit from any of the Fire Stations in the City or at the City's Finance Department at City Hall. The permit costs \$5 and is good for three consecutive days, starting on the day of purchase. Permits are available at the Fire Stations from 8 a.m. to 6 p.m., seven day per week. Please note there may be times when firefighters are not at the station to issue permits, due to the nature of their job. They will only be able to accept payment by check or money order. The Finance Department, located on the third floor

of City Hall, 602 South Main, is open from 8 a.m. to 5 p.m. Monday through Friday. The City Hall location will accept cash, check, debit, money order, or credit card payments. No matter where the Permit is obtained, residents must still inquire with the Joplin Fire Department about weather conditions and if burning is allowed on each day. Residents can obtain this information by calling 623-0403. For information on Joplin residential trash service, call 624-0820, ext. 501. For more information about burn permits and rules, contact the Joplin Fire Department at 623-0403 or go to www.joplinfire.org.

HOW RESIDENTS CAN HELP TO PROTECT OUR WATER QUALITY

- Stop trash from entering storm drains, rivers, creeks, ditches.

- Inspect your septic system routinely.

- Use a commercial car wash or wash your vehicle on your lawn, NOT in the street.

- Dispose of Household Hazardous Waste at the Joplin Recycling Center instead of pouring on the ground or placing in the trash can.

- Use Fertilizers, Pesticides, Herbicides and Fungicides (CHEMICALS) judiciously! Never apply on your lawn or garden before it is due to rain.

- Adopt a stream and clean it up

- Remove all Pet Waste from yard and curb and dispose of in trash to prevent spread of bacteria.

- Never discharge pool or spa



water to a street or storm drain. Let chlorine dissipate for a few days, then drain it gradually onto a landscaped area. Do NOT use copper-based algacides unless absolutely necessary. Control algae with chlorine or alternatives.

- Recycle automotive oil at O'Reilly Auto Parts, or Wal-Mart locations; Recycle automotive antifreeze and oil at Lube-N-Oil.

- Report Illicit Discharges, Spills, or Dumping to the City of Joplin at 417-624-0820, ext. 501.



CREEK-CLEANUP CREW

Members of a cleanup crew this week go about removing debris from the May 22 tornado from Joplin Creek adjacent to Illinois Avenue. Crew member Bob Owens said the most remarkable things found in the creek were a couch and a mattress.

GLOBE | T. ROB BROWN



602 South Main Street • Joplin, Missouri 64801

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JOPLIN RESIDENTIAL CUSTOMER

Schifferdecker Golf Course offer 90¢ green fees in celebration of its 90th birthday

Looking for a way to celebrate summer and warm weather? The Schifferdecker Golf Course is a great place to start. And enjoy a special treat on Friday, June 29 - the Golf Course's 90th Birthday -- by enjoying 90 cent green fees with a cart rental. In addition, guests will also receive birthday cake that day.

Are you interested in golfing throughout the summer? Check out the Course's special golf passes for frequent rounds. The Schifferdecker Golf Course will also be hosting the following tournaments this summer.

- Senior 2 Man..... Tuesday, May 8th
- Summer Kick-Off 4 Person Scramble Friday, May 25th
- Couple ScuffleSaturday, June 30th - Sunday, July 1st
- Ozark Amateur..... Saturday, July 14th- Sunday, July 15th
- Harold Kirk, Jr. Tournament Tuesday, July 17th

Call the Clubhouse at 417-624-5533 if you have questions or are interested in participating in one of the tournaments.

90¢ green fees

Compost Bin and Rain Barrels available on June 2

The Joplin Recycling and Storm Water Education Departments, will host a Compost Bin and Rain Barrel Truckload Sale and Educational Event on Saturday, June 2, 2012 from 9 p.m. to 3 p.m.

This special event will be held rain or shine on the southwest parking lot of Northpark Mall, 101 North Range Line Road, Joplin. There are no residency requirements. Co-sponsors include the Missouri Department of Natural Resources, Region M Solid Waste Management District and Missouri-American Water.

Sale Prices are:

Compost Bins: \$45 - Rain Barrels: \$55 Regularly priced at \$122 and \$120 respectively

Visa, Mastercard, Discover, cash and checks will be accepted. For more information, contact the Joplin Recycling Department at 417-624-0820 Ext. 501.



Rain Barrel



Compost Bin



MISSOURI AMERICAN WATER

DISPOSAL OF LEAVES AND GRASS CLIPPINGS

Some City services have been adjusted following the Joplin tornado, including the availability of the leaves and grass collection bins at the Public Works Center. These bins have been temporarily removed until further notice. In the meantime, residents may bring their leaves and grass clippings directly to the Joplin Compost Facility next to the Turkey Creek Waste Water Treatment Plant at 6937 Eddy Lane. The facility is open all day, every day.

Directions from Joplin: Go north on Schifferdecker Avenue, until you reach a "T" at North Peace Church Avenue and Zora, just north of Turkey Creek; turn left on Peace Church; then take the first left, which is Eddy Lane. The compost facility is located on the left side of the road before the treatment plant.

An alternative to leaf/grass disposal is home composting. To create compost simply put leaves, grass, and meat-free kitchen scraps in your compost bin, and keep it moist. Stirring the mixture will speed up the decomposition process, and then harvest the finished compost from the bottom of the bin. Finished compost should be available in approximately two seasons and produces a free organic fertilizer.

Mary Anne Phillips, the City's Recycling Coordinator, encourages the use of compost instead of non-organic fertilizers and chemicals on lawns and gardens. Compost can be tilled into the soil, thus making the plants healthy and less susceptible to diseases and insects, which will reduce the need for chemicals. Run off of chemical based fertilizers and pesticides can harm bodies of water.

The easiest alternative to leaf disposal is to rake the leaves onto the lawn and run over them with a mulching lawnmower. Less eco-friendly alternatives include setting out bagged leaves/grass for the regular weekly trash service or burning the leaves.

In order to burn, citizens need to obtain a Burn Permit from any of the Fire Stations in the City or at the City's Finance Department at City Hall. The permit costs \$5 and is good for three consecutive days, starting on the day of purchase. Permits are available at the Fire Stations from 8 a.m. to 6 p.m., seven day per week. Please note there may be times when firefighters are not at the station to issue permits, due to the nature of their job. They will only be able to accept payment by check or money order. The Finance Department, located on the third floor of City Hall, 602 South Main, is open from 8 a.m. to 5 p.m. Monday through Friday. The City Hall location will accept cash, check, debit, money order, or credit card payments.

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For information on Joplin residential trash service, call 624-0820, ext. 501. For more information about burn permits and rules, contact the Joplin Fire Department at 623-0403 or go to www.joplinmofire.org.

Two Fire-stations affected by tornado; Fire Station 6 construction continues

When Fire Chief Mitch Randles and his staff worked with architects last year in planning the new fire station in the southwest part of Joplin, they did not realize how beneficial this information would be to the department in following months. With the loss of Fire Station #2, 2216 Maiden Lane, and Fire Station #4, 2010 East 15th Street, this research will be utilized in the design of their replacements.

In addition to the two fire stations destroyed in the May 22 tornado, the Fire Department lost two fire engines, two brush trucks, and extensive damage to equipment and a third engine.

In working with the Federal Emergency Management Association (FEMA), the destroyed buildings were cleared and quickly replaced with temporary structures in order to maintain the City's level of service to our citizens.

The Fire Department is currently working with the City's insurance company and FEMA to facilitate rebuilding these two stations, as well as replacing and repairing the damaged vehicles and equipment. As always, station specifications and locations, building plans, and regulatory considerations are important factors of projects of this size. All current and future requirements and citizen needs are reviewed in the rebuilding process to ensure the new stations and apparatus address the long term goals for the City.

Construction of the new fire station at 5302 West 32nd Street will bring the total number of stations within the City

to six. The southwest station is designed as a state of the art facility and will include: a FEMA-rated safe room for storm protection; construction consistent with LEED (Leadership in Energy and Environmental Design) Silver designation for building design, construction, operations and maintenance; and separate decontamination and laundry areas. The Fire Department is currently hiring and training up to 15 new fire fighters to staff the new station, bringing the total Fire personnel up to 92. Funding for the station, equipment and personnel is provided through the Public Safety Sales Tax passed by Joplin citizens in 2006.

Completion of all projects surrounding the Station #6 project is scheduled for early 2012. Please watch local news media for further announcements about the opening of Station #6.

