The City of Carmel
Stormwater Technical Standards Manual

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CHAPTER 100 POLICY AND PROCEDURES

SECTION 101 INTRODUCTION

101.01 Section Purpose

This manual provides technical standards for proper stormwater management and stormwater quality practices for those engineers, builders, contractors, land planners, and property owners contemplating some form of land alteration or improvement within the City of Carmel. This Stormwater Technical Standards Manual is intended to establish the policies relating to stormwater management, stormwater quality practices, and flood control, submittal requirements and procedures for issuance of a stormwater permit, and procedures for inspection, testing and final acceptance of stormwater facilities.

101.02 Provisions

This Manual, together with all future revisions, shall be referred to as "The City of Carmel Stormwater Technical Standards Manual". The City of Carmel has been granted authority to "protect the safety, health, and general welfare of the citizens of the City of Carmel by requiring compliance with standards and practices, which result in proper stormwater drainage and sediment control in the accomplishment of land alterations or other improvements.

101.03 Applicability

This Manual applies to all land altering projects as stated and defined in §6-181 of the Carmel City Code. Any land alteration, within the jurisdiction of this Manual, shall be accomplished in conformity with the stormwater requirements set forth herein. "Land Alteration" shall generally refer to any on-site or off-site action taken relative to land which either:

1. Changes the contour; or
2. Increases the runoff rate or volume; or
3. Changes the elevation; or
4. Decreases the rate at which water is absorbed; or
5. Changes the drainage pattern; or
6. Creates or changes a stormwater facility; or
7. Involves construction, enlargement, location or relocation of any building on a permanent foundation; or
8. Increases the delivery of point and/or non-point source pollution to streams; or
9. Relocates, encloses, or alters a stream or open channel stormwater conveyance; or
10. Creates an impoundment.

This Manual should be used in conjunction with §6-180 through §6-209 of the Carmel City Code. Additional requirements related to land alteration shall be found in the existing codes and ordinances of the City of Carmel. Exceptions to the provisions of this Manual are provided in §6-180 through §6-209 of the Carmel City Code.

101.04 Stormwater Manual Organization

This Manual is organized to present the technical and engineering procedures and criteria needed to comply with the City of Carmel stormwater regulations. A copy of the City of Carmel's pertinent stormwater management ordinance is presented in the Appendix of this Chapter. In addition, the general design policy and procedures are presented.

101.05 Updating

The process of updating this Manual shall be through the City of Carmel Engineering Department. This Manual shall be periodically updated and revised, as necessary, to reflect current engineering practices and information applicable to the City of Carmel. Users of this Manual shall obtain any and all updates and supplements to this Manual each time a land alteration project is considered. The users shall bear the ultimate responsibility for checking for and obtaining updated material.

The most current standards shall be required for approval of a land alteration. The incorporation of outdated standards in the design, implementation, and construction of a land alteration shall be cause for the City of Carmel to reject the proposed land alteration.

SECTION 102 PERMIT REQUIREMENTS AND PROCEDURES

102.01 Introduction

The project site owner shall submit an application for a stormwater management permit to the City of Carmel per §6-199 of the Carmel City Code.

The project site owner shall submit an application for a Stormwater Management Permit to the City of Carmel. If the applicant is submitting a packet to the City of Carmel Technical Advisory Committee, then the information that should be included with each submittal to satisfy the requirements of the application is detailed in the following sections. If the applicant is not submitting a packet to the Technical Advisory Committee, then the applicant shall still submit Construction Plans (Section 102.02), a Stormwater Drainage Technical Report (Section 102.03), and a Stormwater Pollution Prevention Plan (Section 102.04) to the City of Carmel Engineering Department.

Specific projects or activities may be exempt from all or part of the informational requirements listed below. Exemptions are detailed in the applicable ordinances and "Applicability and Exemptions" Sections of Chapters 200 through 700. If a project or activity is exempt from any or all requirements of the ordinances or this Manual, an application should be filed listing how the exemption criteria are satisfied, in lieu of the information requirements listed below. The level of detailed information requested below is not required from individual lots developed within a larger permitted project site. Review and acceptance of such lots is addressed in Section 102.08 of this Chapter. Conforming to the requirements of this manual does not relieve the project site owner from complying with the requirements of the City of Carmel Flood Hazard Ordinance. Protection must be developed in accordance with that ordinance in addition to those set forth in this manual.

102.02 Construction Plans General

Construction plan sheets (larger than 11" by 17", but not to exceed 24" by 36" in size) with a scale of 1 inch = 20 feet, 30 feet, 40 feet, 50 feet or 60 feet, and an accompanying narrative report shall describe and depict the existing and proposed conditions. The current revision date shall be indicated on all sheets. Construction plans need to include the following detailed items:

i. Title sheet which includes location map, vicinity map, operating authority, design company name, developer name, and index of plan sheets.

ii. A copy of a legal boundary survey for the site, performed in accordance with Rule 12 of Title 865 of the Indiana Administrative Code or any applicable and subsequently adopted rule or regulation for the subdivision limits, including all drainage easements and wetlands.

iii. An overall project stormwater management plan that includes the location, dimensions, and supporting analyses of all detention/retention facilities, primary conveyance facilities, and outlet conditions for all phases of a multi-phase development.

iv. A reduced plat or project site map showing the parcel identification numbers, lot numbers, lot boundaries, easements, and road layout and names. The reduced map shall be legible and submitted on a sheet or sheets no larger than eleven (11) inches by seventeen (17) inches for all phases or sections of the project site.

v. An existing project site layout that shall include the following information:

a. A topographic map of the land to be developed and such adjoining land whose topography may affect the layout or drainage of the development. When a road borders the land being developed, the survey shall include the road to the limits of the right-of-way on the opposite side of the road and across entire frontage. The contour intervals shall be one (1) foot if the general slope of the development is less than or equal to three percent (≤3%) and shall be two (2) feet when the general slope is greater than three percent (>3%). All elevations shall be given in North American Vertical Datum of 1988 (NAVD). The horizontal datum of topographic map shall be based on Indiana State Plane Coordinates, NAD83. The map will contain a notation indicating these datum information. The names of adjoining properties shall be labeled on the map.

a] If the project site is less than or equal to two (2) acres in total land area, the topographic map shall include all topography of land surrounding the site to a distance of at least one hundred (100) feet.

b] If the project site is greater than two (2) acres in total land area, the topographic map shall include all topography of land surrounding the site to a distance of at least two hundred (200) feet.

b. Location, name, and normal water level of all wetlands, lakes, ponds, and water courses on or adjacent to the project site.
c. Location of all existing structures on the project site.
d. One hundred (100) year floodplains, floodway fringes, and floodways, established or identified in accordance with the City of Carmel Flood Hazard Area Ordinance. Please note if none exists.
e. Identification and delineation of vegetative cover such as grass, weeds, brush, and trees on the project site.
f. Location of storm, sanitary, combined sewer, and septic tank systems and outfalls with all top of casting elevation, invert elevations, pipe sizes, and pipe material indicated. Existing structure and pipe information shall be as-built information and not design information.
g. Land use of all adjacent properties.
h. Identification and delineation of sensitive areas.
i. The location of regulated drains, farm drains, inlets and outfalls and associated easements and widths of said easements.
j. Location of all existing cornerstones within the proposed development and a plan to protect and preserve them.
k. Location of all known wells.
l. Location of known potential contaminant facilities.
m. Location of all other known utilities with pertinent information including top of casting elevation, invert elevations, pipe size, valve locations, hand hole locations.
n. Other information per the Digital Submission Policy.

vi. Utility plan sheet(s) showing the location of all existing and proposed utility lines for the project, including all available information related to the utilities, such as pipe size and material, and invert elevations. This shall be in addition to any other plan or profile sheets required by the utility having jurisdiction over the utility installation.

vii. Storm sewer plan/profile sheet(s) at a scale of 5 vertical and 50 horizontal showing the elevation, size, length, slope, location of all proposed storm sewers, including subsurface drains, existing and proposed ground surface profiles, top of casting elevations, structure numbers, pipe invert elevations, casting type, structure type, and all existing and proposed utility crossings also shall be indicated and any other information per the Digital Submission Policy. The actual correct datum (not an assumed one) shall be used for the profile sheets and all invert and other elevations noted. Limits of granular backfill may be indicated on the plan and profile sheets; however, any references with general notes, plan notes, or legends to the granular backfill material shall reference the appropriate trench detail on the detail sheets. The hydraulic grade line shall be indicated on the profiles to demonstrate that the hydraulic grade line remains below the rim elevation for the design condition. The following statement shall be included on all plan/profile sheets:

> The storm sewer system shall be constructed per design specified and as approved by the City of Carmel on the final approved construction plans. Deviations from the approved design shall only be permitted due to special circumstances or difficulty during construction and will require prior field approval from a designated representative of the City of Carmel in addition to supplemental approval by the design engineer. An explanation of any such deviation shall be included as a requirement on as-built/record drawings submitted for release of performance guarantees. Approved design slopes identified as generating velocities of 2.5 fps or less or 10 fps or greater (at full flow capacity) shall require as-built certification at the time of construction, prior to backfilling the pipe. The contractor is instructed to as-built each section of storm pipe as it is being installed to ensure compliance with the design plans and as approved by the City of Carmel.

viii. Proposed subdivision landscape plans

ix. A copy of the subdivision covenants

x. Any other information required by the City of Carmel in order to thoroughly evaluate the submitted material.

xi. A grading and drainage plan, including the following information:

a. Existing drainage facilities, including size, material, invert elevations and top casting information. Existing structure and pipe information shall be as-built information and not design information.
b. Location of all proposed site improvements, including roads, utilities, lot delineation and identification, proposed structures, and common areas.
c. One hundred (100) year floodplains, floodway fringes, and floodways established in accordance with the City of Carmel Flood Hazard Area Ordinance. Please note if none exists.
d. Delineation of all proposed land disturbing activities, including off-site activities that will provide services to the project site.
e. Information regarding any off-site borrow, stockpile, or disposal areas that are associated with a project site, and under the control of the project site owner.
f. Proposed topographic information at one-foot contour interval based on NAVD 1988.
g. Details of all existing streams and watercourses, and new drainage systems such as culverts, bridges, storm sewers, sub-surface drains (for both swales and roadways), curbing, conveyance channels, and 100-year overflow paths/ponding areas shown as hatched areas, along with all associated easements. Details to be shown include structure locations, with structure number reference and top of casting elevations, piping between structures as well as other drainage pipe (roof drains, subsurface drains, etc.). Existing structure and pipe information shall be as-built information and not design elevations.
h. Indication as to the system being public or private.

i. Locations of any off-site drainage swales, ditches and any other facilities that discharge onto the site of the proposed subdivision.
j. Location, size, and dimensions of features such as permanent retention or detention facilities, including natural or constructed wetlands, used for the purpose of stormwater management. Include existing retention or detention facilities that will be maintained, enlarged, or otherwise altered and new ponds or basins to be built, critical pond elevations, pond bottom elevation, top bank elevation, spillway location and elevation, and transverse slopes of dry detention areas.
k. Emergency flood routing path(s) and their invert elevations from detention facilities to the receiving system.
l. One or more typical cross sections of all existing and proposed channels or other open drainage facilities carried to a point above the 100-year high water and showing the elevation of the existing land and the proposed changes, together with the high water elevations expected from the 100-year storm under the controlled conditions called for by the City of Carmel's Stormwater Management Ordinance, and the relationship of structures, streets, and other facilities.
m. A drainage summary, which summarizes the basic conditions of the drainage design, including site acreage, off-site/upstream acreage, allowable release rates, post-developed 10-year, and 100-year flows leaving the site, volume of detention required, volume of detention provided, and any release rate.
n. If a storm sewer or similar type of system is used, provide details showing connection to the main system or method of discharge into stream or reservoir, distance to stream outlet, locations and sizes of lift stations, manholes, inlets, junction boxes, and other necessary appurtenances.
o. The elevations at each corner of every lot, all grade breaks (in swales, or lots and streets), a minimum house pad elevation for each lot or block, and the flood protection grade for each lot or block.
p. Definition of minimum flood protection grade in accordance with this manual.
q. Drainage arrows shall be indicated for all surface drainage, swales and on each side of every break in swale slopes.
r. Label slopes of all surface drainage swales.
s. Typical cross section of pond if not in accordance with standard cross section.
t. Other information required by the Digital Submission Policy.

xii. Site or development plan per the Subdivision Control Ordinance and ADLS/DP Ordinance

xiii. Detail sheets identifying pertinent details related to the stormwater management system.

xiv. A Structure Data Table shall be provided in the plan set. At a minimum, the structure data shall include the following information: structure number reference, upstream structure number, downstream structure number, top casting elevation, upstream pipe elevation, downstream pipe elevation, pipe length, pipe material, pipe size, type of structure and detail reference to type of structure and any notes related to the structure.

102.03
Stormwater Drainage Technical Report General

A stormwater drainage technical report shall contain a discussion of the steps taken in the design of the stormwater drainage system. Note that in order to gain an understanding of and to evaluate the relationship between the proposed improvements for a specific project section/phase and the proposed improvements for an overall multi-section (phased) project, the detailed information requested herein for the first section/phase being permitted shall be accompanied by an overall project plan that includes the location, dimensions, and supporting analyses of all detention/retention facilities, primary conveyance facilities, and outlet conditions. Analysis that includes impact of or impact on existing drainage facilities shall be based on the as-built condition, not the original design condition. The technical report needs to include the following detailed items:

i. Drainage calculations:
   a. Pre-development calculations

i. Pre-development watershed map, including the drainage area designation corresponding to the designations in the drainage calculations, the area in acres for each drainage area and any off-site drainage areas that need to be accommodated by the system, including the fully developed right-of-way per the City of Carmel Thoroughfare Plan, the post developed curve numbers for each drainage area.
ii. Pre-existing soils hydrologic group calculations.
iii. Soils hydrologic group calculations.
iv. Existing conditions peak runoff calculations including the runoff curve number calculation, time of concentration calculation, and anticipated "C" values of master planned areas.
v. Rainfall intensity data table.

b. Post-development calculations
i. Post-development watershed map, including the drainage area designation corresponding to the designations in the drainage calculations, the area in acres for each drainage area, the post developed curve numbers for each drainage area.
ii. Watershed map showing that all off-site acreage draining through the site is accommodated, including the fully developed right-of-way per the City of Carmel Thoroughfare Plan,
iii. Soils hydrologic group calculations.
iv. Post-developed peak runoff calculations including the runoff curve number calculation, time of concentration calculation, and anticipated "C" values of master planned areas.
v. Rainfall intensity data table.

c. Detention calculations
i. Stage/Storage Discharge Calculations
ii. Critical storm discharge routed through pond/outlet structure
iii. Critical pond elevations, including top bank and spillway elevations.

d. Pipe sizing calculations
i. Storm Basin Watershed Map, include the basin area designation corresponding to each individual inlet designation in the drainage calculations and the area in acres for each basin area.
ii. Inlet grate design, including gutter spread calculations.
iii. Confirm sizing of existing roadside culverts to which site runoff (including water draining to culvert from offsite) is being discharged.
vi. Basin runoff coefficients. Master planned areas shall indicate an assumed "C" value for future development.
vii. Time of concentration and time of travel calculations
a. Local basin
b. Aggregate basin
viii. Total runoff calculations
a. Local basin
b. Aggregate basin
ix. Rainfall intensity data table
x. Pipe sizing
xi. Pipe length
xii. Full flow capacity
xiii. Pipe velocities
a. Critical design
b. Full flow capacity
xiv. Hydraulic grade line calculations

ii. A summary report, including the following information:

a. Description of the nature and purpose of the project.

b. The significant drainage problems associated with the project.
c. The analysis procedure used to evaluate these problems and to propose solutions.
d. Any assumptions or special conditions associated with the use of these procedures, especially the hydrologic or hydraulic methods.
e. The proposed design of the drainage control system.
f. The results of the analysis of the proposed drainage control system showing that it does solve the project's drainage problems and that it meets the requirements of the ordinance and these standards. This shall include a table summarizing, for each eventual site outlet, the pre-developed acreage tributary to each eventual site outlet, the unit discharge allowable release rate used, the resulting allowable release rate in cfs for the post-developed 10-year and 100-year events, pre-developed 2-year flow rates in cfs as well as pre- and post-developed flow rates for 10- and 100-year events. The worksheet provided as Table 102-1 should be filled and submitted as part of the report. Any hydrologic or hydraulic calculations or modeling results shall be adequately cited and described in the summary description. If hydrologic or hydraulic models are used, the input and output files for all necessary runs shall be included in the appendices. A map showing any drainage area subdivisions used in the analysis shall accompany the report.
g. Soil properties, characteristics, limitations, and hazards associated with the project site and the measures that will be integrated into the project to overcome or minimize adverse soil conditions.
h. A narrative and photographic record of the condition of the downstream receiving system and a report of the expected impact of the development's stormwater runoff or any receiving stream or downstream property.
i. Identification of any other State or Federal water quality permits that are required for construction activities associated with the owner's project site.
j. Proof of Errors and Omissions Insurance for the registered professional engineer or licensed surveyor showing a minimum amount of $1,000,000 in coverage.
k. Current revision date.
l. A statement as to whether or not the FEMA Base Flood elevation will flood portions of the property via the outfall or storm piping system.

iii. A Hydrologic/Hydraulic Analysis, consistent with the methodologies and calculation included in Chapters 200 and 300 of this Manual, and including the following information:

a. A hydraulic report detailing existing and proposed drainage patterns on the subject site. The report should include a description of present land use and proposed land use. Any off-site drainage entering the site or any downstream restrictions shall be addressed as well and accommodated by the system. This report should be comprehensive and detail all of the steps the engineer took during the design process.
b. All hydrologic and hydraulic computations should be included in the submittal. These calculations should include, but are not limited to the following: runoff calculations, stage-discharge relationships, and storage volumes.
c. Copies of all computer runs. These computer runs should include both the input and the outputs. Electronic copies of the computer runs with input files shall also be included.
d. A set of exhibits should be included showing the drainage sub-areas and a schematic detailing of how the computer models were set up.
e. A conclusion which summarizes the hydraulic design and details how this design satisfies the City of Carmel's Stormwater Management Ordinance.

102.04
Stormwater Pollution Prevention Plan General

A Stormwater Pollution Prevention Plan (SWPPP) for new development and redevelopment shall contain a SWPPP for construction and post-construction activities:

i. SWPPP for Construction Sites:

a. Location, dimensions, detailed specifications, and construction details of all temporary and permanent stormwater quality measures.
b. Soil map of the predominant soil types, as determined by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Soil Survey, or as determined by a soil scientist. Hydrologic classification for soils should be shown when hydrologic methods requiring soils information are used. A soil legend shall be included with the soil map accompanied by a brief description of how the site has accommodated the existing soil limitations.
c. 14-Digit Watershed Hydrologic Unit Code.
d. An estimate of the peak discharge, based on the ten (10) year storm 24-hour event, of the project site for post-construction conditions.
e. Locations where stormwater may be directly discharged into groundwater, such as abandoned wells or sinkholes. Please note if none exists.
f. Locations of specific points where stormwater discharge will leave the project site.
g. Name of all receiving waters. If the discharge is to a separate MS4, identify the name of the municipal owner and the ultimate receiving water.
h. Temporary stabilization plans and sequence of implementation, including specifications and application rates for soil amendments and seed mixtures and the type and application rate for anchored mulch.
i. Permanent stabilization plans and sequence of implementation, including specifications and application rates for soil amendments and seed mixtures and the type and application rate for anchored mulch.
j. General construction sequence of how the project site will be built, including phases of construction.
k. Construction sequence describing the relationship between implementation of stormwater quality measures and stages of construction activities.
l. Location of proposed soil stockpiles and borrow areas or disposal areas.
m. A typical erosion and sediment control plan for individual lot development.
n. A description of potential pollutant sources associated with the construction activities.
o. Material handling and storage associated with construction activity shall meet the spill prevention and spill response requirements in 327 IAC 2-6.1.
p. Name, address, telephone number, and list of qualifications of the trained individual in charge of the mandatory stormwater pollution prevention self-monitoring program for the project site.
q. Current revision date on all sheets.

ii. SWPPP for Post-Construction
a. Description of the potential pollutant sources associated with the proposed land use.
b. Location, dimensions, detailed specifications, and construction details of all post-construction stormwater quality measures.
c. A sequence describing when each post-construction stormwater quality measure will be installed.
d. A description of measures that will be installed to control pollutants in stormwater discharges that will occur after construction activities have been completed. Such practices include infiltration of runoff, flow reduction by use of open vegetated swales and natural depressions, buffer strip and riparian zone preservation, filter strip creation, minimization of land disturbance and surface imperviousness, maximization of open space, and stormwater retention and detention ponds.
e. Stormwater quality measures that will be implemented to prevent or minimize adverse impacts to stream and riparian habitat.
f. An operation and maintenance manual for all post-construction stormwater quality measures to facilitate their proper long-term function. This operation and maintenance manual shall be made available to future parties who will assume responsibility for the operation and maintenance of the post-construction stormwater quality measures. The manual shall include the following:
    i. Contact information for the BMP owner (i.e. name, address, business phone number, cell phone number, pager number, e-mail address).

ii. A statement that the BMP owner is responsible for all costs associated with maintaining the BMP.
iii. A right-of-entry statement allowing the City of Carmel to inspect and maintain the BMP.
iv. Specific actions to be taken regarding routine maintenance, remedial maintenance of structural components, and sediment removal. Sediment removal procedures should be explained in both narrative and graphical forms. A tabular schedule should be provided listing all maintenance activities and dates for performing these required maintenance activities.
v. Site drawings showing the location of the BMP and access easement, cross sections of BMP features (i.e. pond, forebay(s), structural components, etc.), and the point of discharge for stormwater treated by the BMP.

102.05 Primary Plat Submission Requirements for Residential Sites

Plans submitted to the City of Carmel Technical Advisory Committee for primary plat shall include the following, in addition to requirements from other applicable City codes:

i. Basic drainage information, including the location of proposed methods of drainage:
   a. If a storm sewer or similar type of system is planned, show connection into stream or reservoir; distance to stream outlet; lift stations, if any; approximate size; approximate location; manholes, if any; inlets; junction boxes and other necessary appurtenances.
   b. If surface drainage is planned (roadside ditches, swales, grassed waterways, water courses, open ditches, roll curb and gutter sections), show location of said type; location and approximate size of road culverts; and location and typical cross-section of grades, swales, waterways, roadside ditches and open ditches, if applicable.
   c. If subsurface drain tile is planned, show location; connection to storm sewer; outlet in open drain or retention facility or other adequate outlet.
   d. Indicate portions of site within a floodway, flood fringe, or floodplain as determined by the City of Carmel Flood Hazard Area Ordinance.
   e. Minimum flood protection grades.
   f. The approximate location, size, and capacity of any retention basins to be located in or directly affecting the proposed subdivision, critical pond elevations, top of bank and spillway elevations.
   g. A statement as to whether or not the FEMA Base Flood elevation will flood portions of the property via the outfall or storm piping system.
   h. Indicate flood routing of off-site and on-site runoff.
   i. Basic outline of post construction stormwater quality features (locations, sizes, easements, etc.)

ii. Pre-Developed Drainage Report
   a. Pre-development watershed map including any off-site drainage areas that need to be accommodated, including the fully developed right-of-way per the City of Carmel 20-year Thoroughfare Plan.
   b. Existing conditions peak runoff calculations.

iii. Post-Developed Drainage Report
   a. Post-developed watershed map including off-site drainage areas that need to be accommodated, including the fully developed right-of-way per the City of Carmel 20-year Thoroughfare Plan.
   b. Post-developed conditions peak runoff calculations.
   c. Detention/retention calculations
      i. Detention volume required and detention volume provided.
      ii. Critical storm discharge routed through pond/outlet structures
      iii. Critical pond elevations including top bank and spillway elevations.
      iv. Support reports/calculations

iv. Summary Report
   a. Flooding potential, if any, of the proposed subdivision
   b. The expected impact of the proposed subdivision's storm water runoff on any receiving stream or downstream property.
   c. If legal drains are involved, comments from the Hamilton County Drainage Board shall be included.
   d. If a floodplain of a watershed in excess of one (1) square mile is involved, reports, recommendations, and approvals, where necessary, from the Indiana Natural Resources Commission shall be included.
   e. General statement and supporting documentation demonstrating that detention of the fully developed right-of-way per the City of Carmel 20-year Thoroughfare Plan has been accommodated in the detention facility per Section 302 of this manual, and piping has been sized to convey runoff from the right-of-way to interior ponds.

102.06 Secondary Plat Submission Requirements for Residential Sites

Plans submitted to the City of Carmel Technical Advisory Committee for secondary plat shall include the following, in addition to the requirements of other applicable City codes:

i. Construction Plans (Section 102.02)

ii. Stormwater Drainage Technical Report (Section 102.03)

iii. Stormwater Pollution Prevention Plan (Section 102.04)

102.07 ADLS Development Plan Submission

Plans submitted to the City of Carmel Technical Advisory Committee as part of the ADLS/DP approval process, shall include the following, in addition to the requirements of other applicable City codes:

i. Construction Plans (Section 102.02)

ii. Stormwater Drainage Technical Report (Section 102.03)

iii. Stormwater Pollution Prevention Plan (Section 102.04)

102.08 Review of Individual Lots Within a Permitted Project

For individual lots disturbing less than 1 acre, developed within a larger permitted project, a formal review and issuance of an Individual Lot Plot Plan Permit will be required before a building permit can be issued. All stormwater management measures necessary to comply with the City of Carmel's Stormwater Management Ordinance shall be implemented in accordance with permitted plan for the larger project.

The following information shall be submitted to the City of Carmel, for review and acceptance, by the individual lot owner as part of a request for review and issuance of an Individual Lot Plot Plan Permit that shall be obtained prior to the issuance of a building permit.

A. The individual lot operator shall complete a Residential Lot Plot Plan Permit Request and pay the applicable fee.
B. A certified site layout for the subject lot and all adjacent lots showing building pad location, dimensions, and elevations, and the drainage patterns and swales.
C. Erosion and sediment control plan that, at a minimum, includes the following measures:
   i. Installation and maintenance of a stable construction site access.
   ii. Installation and maintenance of appropriate perimeter erosion and sediment control measures prior to land disturbance.

iii. Minimization of sediment discharge and tracking from the lot.
iv. Clean up of sediment that is either tracked or washed onto roads. Bulk clearing of sediment shall not include flushing the area with water. Cleared sediment shall be redistributed or disposed of in a manner that is in compliance with all applicable statutes and rules.
v. Adjacent lots disturbed by an individual lot operator shall be repaired and stabilized with temporary or permanent surface stabilization.
vi. Self-monitoring program including plan and procedures.

D. Name, address, telephone number, and list of qualifications of the trained individual in charge of the mandatory stormwater pollution prevention self-monitoring program for the project site.

The individual lot owner is responsible for installation and maintenance of all erosion and sediment control measures until the site is stabilized.

102.09
Changes to Plans

Any changes or deviations in the detailed plans and specifications after approval of the applicable stormwater management permit shall be filed with, and accepted by, the City of Carmel prior to the land development involving the change. Copies of the changes, if accepted, shall be attached to the original plans and specifications.

SECTION 103 RECORD DRAWINGS

103.01
As-built or
Record Drawings

As part of the final acceptance process, record drawings of the stormwater facilities shall be submitted to the City of Carmel

After completion of construction of the project and before final project acceptance of the stormwater management plan (the issuance of a "verified" NOT or release of performance sureties), a professionally prepared and certified record drawings ('as-built' set of plans) by a Professional Engineer or licensed Land Surveyor registered in the State of Indiana shall be submitted to the City of Carmel for review. Additionally, a digital copy of the record drawings ('as-built' plans) as well as finalized digital versions of all analyses, models, manuals, and reports that are consistent with the as-built conditions are required in a format accepted by the City of Carmel and the Digital Submission policy. Data shall include, but not be limited to:

A. Pipe size and pipe material

B. Invert elevations

C. Top rim elevations

D. Pipe structure lengths

E. BMP types, dimensions, and boundaries/easements

F. "As-planted" plans for BMPs, as applicable

G. Data and calculations showing detention basin storage volume

H. Data and calculations showing BMP treatment capacity

I. Flowline of rear and/or side yard swales at fifty (50) foot intervals or at lot lines

J. Horizontal alignment of storm drain pipes, culverts, streets, and storm drain structures, to a minimum accuracy of +/- two (2) feet

K. The horizontal locations and/or bank cross sections for all detention/retention facilities or other information sufficient to verify that the constructed detention/retention facility provides the required minimum runoff storage volumebe in accordance with Hamilton County Record Drawing and Digital Submission Standards established under Hamilton County Ordinance 4-11-05-A and its amendments.

L. Any other pertinent data relevant to the completed storm drainage system and stormwater management facilities.

M. Other data required by the Digital Submission Policy.

SECTION 104 OTHER REQUIREMENTS

104.01 Minimum Requirements

Each development shall design, provide, and install a stormwater collection and conveyance system to include storm sewer piping, inlets, catch basins and manholes, and an adequately sized stormwater detention facility, and rear yard or other swales such that adequate drainage per the standards of this manual of streets, roadways, alleys, lots, yards, open areas, parking facilities, etc. is provided.

1. All swales shall be installed with a subsurface drain.
2. A rear-yard subsurface drain shall be installed with outlets/connection points for each lot or anticipated connection point.

104.02 Grading and Building Pad Elevations

Maximum yard slopes are 3:1 where soil has been disturbed during construction processes. Finished floor elevation or the lowest building entry elevation shall be no less than 6 inches above finished grade around the building. Also, the building's lowest entry elevation that is adjacent to and facing a road shall be a minimum of 12 inches above the road elevation.

All buildings shall have a minimum flood protection grade shown on the secondary plat. Minimum Flood Protection Grade of all structures fronting a pond or open ditch shall be no less than 2 feet above any adjacent 100-year local or regional flood elevations, whichever is greater, for all windows, doors, pipe entrances, window wells, and any other structure member where floodwaters can enter a building.

For all structures located in the Special Flood Hazards Area (SFHA) as shown on the FEMA maps, the lowest floor elevations of all residential, commercial, or industrial buildings shall be such that Lowest Floor elevation, including basement, shall be at the flood protection grade and therefore have 2 feet of freeboard above the 100-year flood elevation.

The Lowest Adjacent Grade for residential, commercial, or industrial buildings outside a FEMA or IDNR designated floodplain shall have two feet of freeboard above the flooding source's 100-year flood elevation under proposed conditions. Lowest Adjacent Grade is the elevation of the lowest grade adjacent to a structure, where the soil meets the foundation around the outside of the structure (including structural members such as basement walkout, patios, decks, porches, support posts or piers, and rim of the window well.

For areas outside a FEMA or IDNR designated floodplain, the Lowest Adjacent Grade (including walkout basement floor elevation) for all residential, commercial, or industrial buildings adjacent to ponds shall be

set a minimum of 2 feet above the 100-year pond elevation or 2 feet above the emergency overflow weir elevation, whichever is higher. In addition to the Lowest Adjacent Grade requirements, any basement floor shall be at least a foot above the permanent water level (normal pool elevation).

Special considerations, based on detailed geotechnical analysis, should be made prior to considering placement of any basement below the 100-year flood elevation of an adjacent flooding source or pond.

All premises shall be graded so as to prevent the accumulation of stagnant water thereon, within any structure located thereon, or on other premises. Stagnant water shall be determined as any accumulation that has not dispersed within seven (7) days of the last recorded local rainfall, with the exception of Stormwater Detention or Stormwater Quality Facilities approved and or permitted by the City of Carmel. Grading, filling, excavating or any change in the grade of any premises is permitted outside of platted or dedicated easements or rights-of-way, but shall be acceptable in appearance, shall not cause, create or result in or represent the potential to cause, create or result in a Detriment (as defined in the City of Carmel Property Maintenance Code), and shall not result in the diversion of stormwater to surrounding properties. Any obstruction of the natural flow of drainage in the City of Carmel is prohibited.

Table 102-1: Allowable Release rate Determination and Modeling Results

Site Outlet #	Item	Pre-Development					post-development				
		D.A. (ac)	Depress. Storage? (yes/no)	2-Yr.	10-Yr.	100-Yr.	D.A. (ac)	Depress. Storage? (yes/no)	2-Yr.	10-Yr.	100-Yr.
1	Default Unit Discharge Allowable Release Rate (cfs/acre)									0.1	0.3
	Basin-Specific Unit Discharge Allowable Release Rate, if any (cfs/acre)										
	Unit Discharge Allowable Release Rate Based on D/S Restrictions, if any (cfs/acre)										
	Adopted Unit Discharge Allowable Release Rate (cfs/acre)										
	Allowable Release Rate (cfs)										
	Modeling Results (cfs)							no			

Table 104-1: Listing of Post-Construction Stormwater Quality BMPs Proposed to be Accepted as Part of Hamilton County Regulated Drainage System

Structure Number	BMP Name	BMP Description	BMP Location

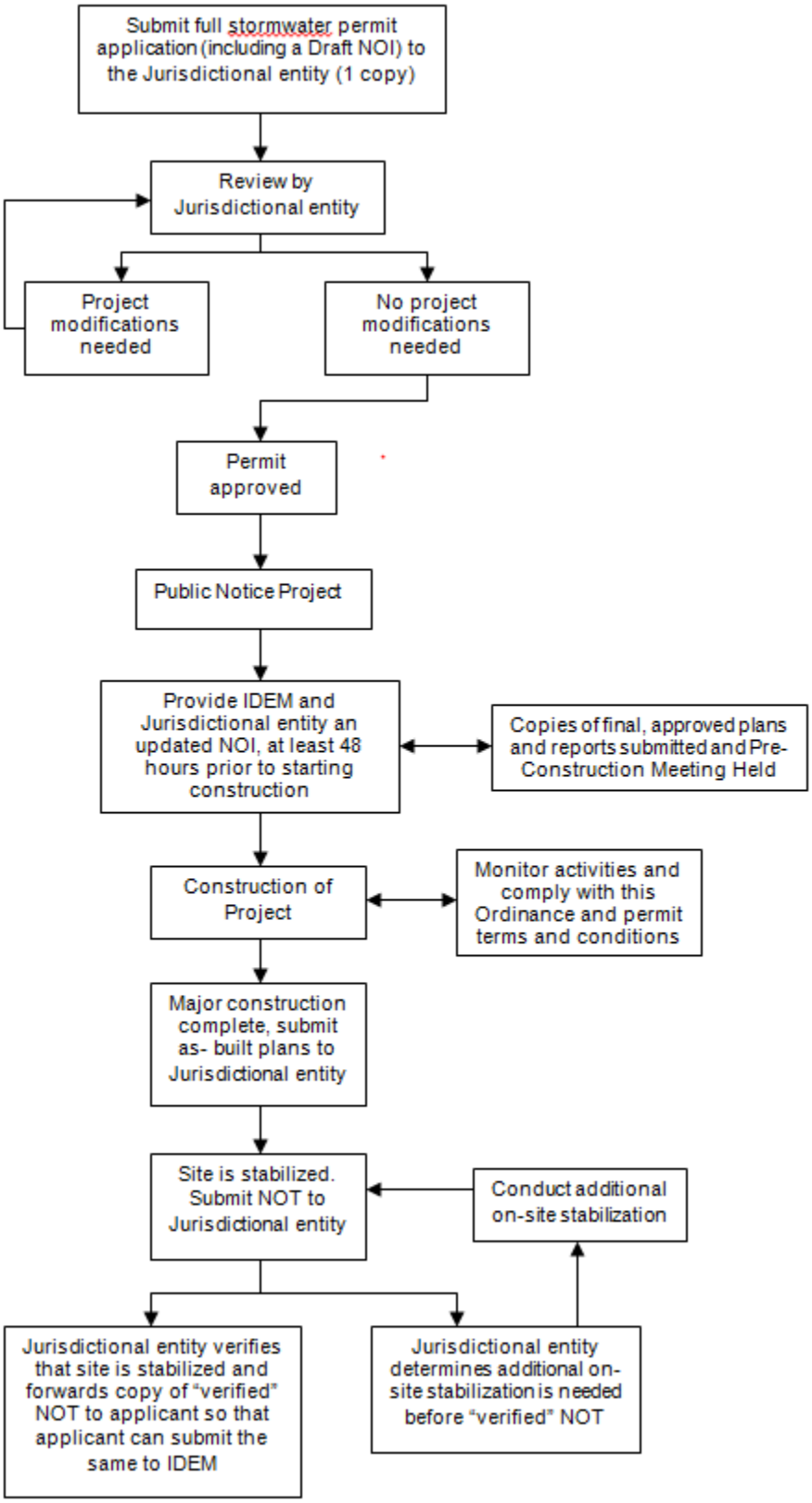

Exhibit 102-1: Flow Chart of the Stormwater Plan Review/Permit Process

APPENDIX 101-1

CITY OF CARMEL STORMWATER MANAGEMENT ORDINANCE