OVERALL SITE and DRAINAGE CERTIFICATION

Commercial, Multi-Family and Subdivision Certification Form and Checklist

Project Name: _____

Date: _____

Building Permit Numbers: _____
(Commercial or multi-family)

Per the requirement in Fort Collins Stormwater Criteria Manual (FCSCM) Chapter 3, Section 3.0 to certify as-built construction to the approved drainage and grading plans, please fill in all applicable items in this Certification Form for Commercial, Multi-Family and Overall Single Family sites. **NOTE: several items must be verified during construction.** A copy of the approved grading plan must be submitted with the as-built grading plan. (As-built elevations must be written in red next to the approved elevations.)

- Use "Yes" for items completed as described.
- Use "N/A" for items that are not applicable to the site being certified.
- If any blanks are "No," attach an explanation referencing the item number below.

Attach an explanation or description of the as-built condition for any items listed or for anything not listed but shown on the approved construction plans.

Provide an as-built redline or Mylar drawing with the following:

I. <u>Water Quality and Quantity Detention Basin - FCSCM Ch. 6 and 7</u>

For multiple detention basins on a site, provide the following for each basin separately:

A. **Volume**: _____ As-built topographic verification is attached at 1-foot (or less) contour intervals and volume verification calculations for the water quality capture volume and the 100-year detention storage volume.

1. _____ Detention basin topography was prepared by a professional land surveyor registered in the state of Colorado.
2. _____ Both proposed and as-built contours are shown on the same plan sheet (dashed lines for proposed and solid lines for as-built).
3. _____ All critical spot elevations as shown on the approved construction plans have been verified and the as-built elevations are shown on the plan sheet.
4. _____ Stage-storage-discharge tables are provided on a separate document.
5. _____ Verification that designed drain time is in compliance with Colorado Revised Statute § 37-92-602(8) is attached and has been uploaded to the Statewide Compliance Portal (tinyurl.com/COCompliancePortal) for approval. Uploaded documents must include:
   a. The cover sheet from the approved drainage report
   b. The stamped certification page from the approved drainage report
   c. As-built topographic survey
   d. Stamped certification page from the Overall Site & Drainage Certification
   e. PDF output from the Stormwater Detention and Infiltration Design Data Speadsheet

B. **Water Quality and Quantity Detention Basin Grading**: _____ Attached is as-built verification that there is a minimum 2% positive fall into the concrete trickle pans or flow-line(s) from all areas in the bottom of the detention pond. If there is a "soft pan" in the flow-line, all areas still must meet the minimum 2% grade requirement.

1. **Low Flow**: ***Choose one*** of the following detention basin low flow options as applicable:
   a. _____ Turf swale for low flow path in detention basin.
   There is a minimum 2% grade in the flow-line(s) of the detention basin. The flattest as-built grade is _____.
   b. _____ Concrete pan for low flow in detention basin.
   There is a concrete pan installed that meets the grades as shown on the approved construction plans. (Show as-built spot elevations.)
   c. _____ Soft pan for low flow in detention basin.
   - Verify and document the soft pan material gradation, trench width and depth - ***to be verified during construction by engineer.*** Picture documentation is preferred or engineer's statement of visual inspection and compliance. (Choose one below.)
     - _____ There is a soft pan ***with an underdrain*** installed that meets the design on the approved construction plans. (Show the underdrain grades, bedding material, geotextile, spot elevations, bends, cleanouts, etc.)
     - _____ There is soft pan installed ***without an underdrain*** but there is a type A or B soil. The soil type must be documented by supplying verification from a registered professional geotechnical engineer.

NOTE: Spot elevations are to be within 0.2 ft. +/-.

2. **Side Slopes**: _____ The as-built side slopes of the detention basin have been calculated and are shown. Indicate the side slope with an arrow and a numerical value (e.g., 6.25:1). The maximum slope allowed is 4:1. Small areas of 3:1 may be acceptable, but slopes steeper than 3:1 must be stabilized or re-graded. Provide documentation if a variance was granted for steeper slopes during the design process.

3. **Spillway:** The following items must be field verified:
   a. _____ The location of the spillway is indicated on the as-built plan.
   b. _____ The width of the spillway is indicated on the as-built plan.
   c. _____ The elevation(s) of the spillway is shown on the as-built plan.
   d. _____ A concrete ribbon defines the location and grade of the spillway.
   e. _____ There is downstream scour protection in the spillway as per the construction plans. Indicate type: _____ (riprap size "D50" gradation and bedding type, geotextile, buried riprap with _____ inches of bury, etc.).
   f. _____ There are no obstructions in the spillway, such as trees, bushes, sidewalks, landscape features, rocks, etc.

4. **Outlet Structure:**
   a. _____ The orifice plate for the approved release rate is installed with the correct size and location of the orifice.
   b. _____ The orifice plate for the water quality outlet is installed with the correct hole size, number of rows and columns of holes.
   c. _____ The bottom hole on both the water quality and quantity outlets are at the bottom of the plate so no water ponds in front of the plate.
   d. _____ The well screen is the correct material and is installed as shown on the construction plans.
   e. _____ 100-year overflow grate elevation is _____. (Elev. A on detail D-46)
   f. _____ The top elevation of the water quality capture volume is _____. (Elev. B on detail D-46)
   g. _____ Overflow grate is made of the correct material, has the correct bar spacing, is hinged at the top and bolted at the bottom.
   h. _____ The bottom of the outlet box has no obstructions or misalignments that will cause it to retain runoff water and is sloped at 2% towards outlet.

II. <u>Channels/Swales - FCSCM Ch. 8, Sec. 2.0 and Ch. 9, Sec. 5.0</u>

A. **Capacity**: _____ The as-built capacity of all the major channels and swales has been verified. They meet or exceed capacity requirements shown in the approved drainage study for this project.
   1. _____ All swales are located within the drainage easements as shown on the construction plans.
   2. _____ Longitudinal slopes and side-slopes (cross-sections) have been verified. Design criteria requires longitudinal slopes of 2% min. (on vegetated swales) and side-slopes no steeper than 4:1. If these criteria are not met, the certification engineer will write a justification and propose mitigation for each instance or have the issues corrected. If variances to these criteria have previously been approved and are shown on the construction plans, no justification is needed.
   3. _____ As-built spot elevations on channels/swales are shown that correspond to spot elevations shown on the approved construction plans.
   4. _____ All permanent erosion control measures are installed as shown on the approved construction plans (e.g., drop structures, riprap, TRMs, etc.). (Include pictures and verification of the materials used as part of this verification.)
   5. _____ All pans, curbs, storm pipes or other appurtenances appropriately tie into each other in the system. (Pictures at tie-in points suggested.)
   6. _____ The minimum freeboard is provided for all channels and swales as shown on the approved construction plans or as identified in the approved drainage study. (Show the freeboard provided on the cross-sections as on the construction plan set or attached as separate documentation.)
   7. _____ The low flow portion of all channels or swales is clear of obstructions. (No landscaping, trees, shrubs, sod, etc. infringe on the low flow portion of channels or swales.)

III. Storm Pipes (aka storm drains) - FCSCM Ch. 9, Sec. 4.0

A. **Storm Drain Pipe Capacity**: _____ The as-built capacity of all pipes installed on this project has been verified and meets or exceeds the capacity requirements shown in the approved drainage study for this project.
   1. _____ All storm drain pipe sizes and materials have been verified and are in conformance with the approved construction plans. (Indicate on the plan and profile sheets that they have been verified.) Material and size substitutions must be approved prior to installation. If a pipe size or material was changed during construction, the certification engineer must attach the approval documents or supply them with this certification. Approval documents must include a calculation documenting the capacity equivalency (equal or greater) of the substituted size.
   2. _____ The longitudinal slope of the pipe is as shown on the approved construction plans. The acceptable minimum slope is 0.4%. All slopes flatter than the designed slope on the construction plans must be justified with capacity calculations on an attached sheet.
   3. _____ The as-built invert elevations have been verified and are shown on the plan and profile sheets of the approved construction plans.

B. **Storm Drain Pipe Installation Requirements**: _____ All pipes are installed in accordance with the approved construction plans and construction specifications.
   1. _____ The minimum cover requirements for all pipes have been met as shown on the approved construction plans. These will be called out in critical locations.
   2. _____ All encasements and clearances as specified on the approved construction plans have been met.
   3. _____ Any specific joint types or construction methods specified on the approved construction plans have been met. (List on a separate sheet and attach to this certification.)

IV. Concrete Pans - FCSCM Ch. 8, Sec. 2.0

A. **Construction/Installation**: _____ All concrete pans have been constructed in accordance with the approved construction plans.
   1. _____ The concrete pans are the correct size/width as shown on the approved construction plans.
   2. _____ The longitudinal slopes of the pans are as shown on the approved construction plans. The certification engineer must justify or mitigate longitudinal slopes less than the minimum of 0.4% unless a flatter slope was approved and is shown on the approved construction plans. Provide mitigation or justification by separate document.
   3. _____ The cross-section of the pan is as shown on the construction plans. (Specifically, the pan cross-section is “V” shaped and meets the side slope shown on the detail.)
   4. _____ The concrete pans are a minimum of 6 inches thick without reinforcement and a minimum of 4 inches thick with a minimum of 6X6-W14xW14 reinforcement per detail D20B and D20C. (Provide documentation of the reinforcement used if different than shown on the details or on the approved construction plans.)
   5. _____ The spot elevations shown on the concrete pan(s) have been verified and are shown on the as-built drawings.

V. Storm Drain Inlets - FCSCM Ch. 9, Sec. 3.0

A. **Construction/Installation**: _____ All storm drain inlets have been constructed in accordance with the approved construction plans and construction specifications.
   1. _____ The size and type of inlets are consistent with the inlets shown on the approved construction plan. Indicate by writing "Verified" on each inlet on the plan sheet or list on a separate document the inlet number(s), type and size (length). If the inlet installed is other than the one on the approved construction plan detail sheet, provide the name and source of the detail with justification for equal or better capacity.
   2. _____ The size of the inlet opening is consistent with the approved detail. (Check height and width.)
   3. _____ The elevation of the grate (if applicable) is at the elevation shown on the street profile or as indicated by a spot elevation on the construction plans.
   4. _____ The as-built invert elevations of all pipes entering and leaving the inlet are shown on the plan and profile sheets within construction tolerance of 0.2 feet. If substantially different, provide justification and capacity calculations to show the capacity is not affected or propose mitigation.
   5. _____ The as-built size of the inlet box is as shown on the construction plans or an explanation or justification is attached.
   6. _____ All Type C, R, 13 and 16 inlet covers are stenciled or stamped with the following designation (or an equivalent): NO DUMPING – DRAINS TO POUDRE RIVER.

VI. Culverts - FCSCM Ch. 9, Sec. 4.0

A. **Construction/Installation**: _____ All culverts have been constructed and/or installed in accordance with the approved construction plans and construction specifications.
   1. _____ All culvert sizes have been verified as indicated on the as-built construction plans as correct.
   2. _____ The culvert material type for all culverts installed is as on the approved construction plans and is indicated on the as-built plans.
   3. _____ The as-built invert "in and out" elevations have been verified and are indicated on the as-built construction plans.
   4. _____ The culvert headwalls or wing walls have been installed as shown on the approved construction plans. Headwalls or wing walls may be needed in the as-built conditions onsite if the slopes adjacent to the culvert are greater than 4:1. Please note areas needing stabilization in the certification narrative. An alternative to consider is a turf reinforcement mat (TRM).

VII. Sub-Drains

A. **Construction/Installation**: _____ All sub-drains shown on the construction plans have been installed in accordance with those plans and the construction specifications. Sub-drains installed with the sanitary sewer are to be verified on the sanitary sewer plan and profile sheets of the construction plans. (NOTE: Indicate any sub-drains installed after the plans were approved on the as-built plans.)
   1. _____ The size of the sub-drains are as approved on the construction plans and are indicated on the as-built plans.
   2. _____ The type of sub-drain, in particular the perforated and non-perforated sections of the drain, are as indicated on the approved construction plans.

3. _____ The cover requirements per the construction plans are provided.
4. _____ The cleanouts have been installed at the locations shown on the construction plans and are accessible for cleaning. (Cleanouts can be buried a maximum of 6 inches deep with their locations marked.)
5. _____ The backfill materials for sub-drains are as shown on the approved construction plans. (This includes the type, depth and width.)
6. _____ The geo-textile liner completely wraps the sub-drain and the permeable backfill material unless shown otherwise on the approved construction plans. (Sub-drain pipe wrapped in a sock filter material is accepted only if approved prior to installation.)

VIII. Curb Cuts

A. **Construction**: _____ All curb cut openings are constructed in accordance with the approved construction plans and construction specifications.
1. _____ The size (width) of the curb cut opening is as shown on the approved construction plans.
2. _____ The curb cut openings tie into a downstream swale, pipe, or other appurtenances with a smooth transition and there no obstructions such as riprap or sod impeding the flow downstream of the curb cut.

IX. Sidewalk Culverts & Chases

A. **Construction/Installation**: _____ All sidewalk culverts have been installed at the locations shown on the approved construction plans.
1. _____ The size (width and length) of the culverts are as shown on the approved construction plans.
2. _____ The cover plate is a minimum 5/8-inch galvanized plate bolted to a galvanized angle iron per the detail shown on the approved construction plans or per the City's detail.
3. _____ The sidewalk culvert invert "in and out" elevations have been verified and are indicated on the as-built plans.
4. _____ The sidewalk culvert opening is as shown on the approved construction plans or per the City's detail.
5. _____ There is a smooth transition both on the inlet and outlet ends of the sidewalk culvert with no obstructions such as riprap or sod impeding the flow into or out of the sidewalk culvert.

X. Site Grading - FCSCM Ch. 8

A. **Construction**: _____ All common open spaces have been graded in accordance with the approved construction plans.
1. _____ The grading on all common open spaces bordering private lots has been verified as correct and the as-built rear lot corner elevations have been shown on the as-built plans.

2. _____ The as-built contours for “overlot grading” are shown on the as-built construction plans for all common open spaces, tracts, outlots, etc. If not in compliance, please attach a narrative describing the situation for noncompliance and when it may be corrected. An escrow for overlot grading may be required. (NOTE: Residential Lot Grading Certification is a separate process from this Overall Site Certification. It is understood that residential lots will be brought to final grade once the foundation is backfilled so they may be lower than the plan shows at this Overall Site Certification stage.)
3. _____ All turf reinforcement mats (TRMs) have been installed as shown on the approved construction plans and the slopes are stabilized.

XI. Permanent Erosion Control BMPs - FCSCM Ch. 9, Sec. 7.0

A. **Construction**: _____ All permanent erosion control BMPs have been installed per the approved construction plans.
   1. _____ All riprap has been installed in the locations and sizes indicated on the approved construction plans.
   2. _____ All fabric has been installed in the locations and sizes indicated on the approved construction plans.
      a. _____ All fabric was installed per the details on the approved construction plans.

XII. Post-Construction Site Cleanup - FCSCM Ch. 3, Sec. 2.0

A. **Construction**: _____ All construction debris and obstructions of any kind have been removed from drainage paths.
   1. _____ All construction debris has been removed except in staging area(s).
   2. _____ All ruts have been smoothed out in all construction areas.
   3. _____ All areas needing reseeding have been identified and future stabilization goals have been coordinated with the Erosion Control Inspector and in accordance with FCSCM Vol.2 Chapter 12. Note the area needing stabilization in the narrative.

XIII. Certification of LID and Water Quality Facilities - FCSCM Ch. 7

A. _____ Attached are the During Construction Inspection Checklist for Low Impact Development (LID) and other items to be verified during construction, along with pictures and other required documentation.
B. _____ Attached is verification of the rain garden and/or sand filter flat surface area(s) and ponding volume(s). This verification includes survey of critical elevations.
C. _____ Attached is verification of the underground infiltration required volume(s), weir elevations, orifices, inspection ports and filtering fabric. This verification includes survey of critical elevations.
D. _____ All visible LID design features were verified as part of the engineer's site visit.

XIV. Certification of Other Permanent BMPs

A. _____ The construction of other permanent BMPs not specifically addressed in this certification is in accordance with the approved plan. This may include grade control structures, rundowns, bridges, stream access/improvements, etc.
Please specify other permanent BMPs included on this site: _____

XV. Certification and Erosion Control Measures - FCSCM Ch. 3

A. All temporary erosion control measures shall be removed upon stabilization. If at the time of preparing this certification there are any erosion control measures still remaining on the site, please note them in the narrative and verify that they need to remain at this time. If in doubt as to the need for any control measure, please consult with the Erosion Control Inspector at erosion@fcgov.com.

XVI. Statement of Compliance - FCSCM Ch. 3

A. This certification is signed and stamped. By signing this form, the engineer(s) attests that he/she has visited and observed the site, and to the best of his/her knowledge, the as-built conditions of the drainage facilities are as described in the above form and in the enclosed as-built plans.

B. Failure to properly disclose all known information could result in the rejection of this certification and prevent the release of any and all Stormwater Utility permit holds on Building Permits and/or Certificates of Occupancy within this development.

XVII. Signature and Stamp by a Colorado-Registered Professional Engineer

Engineer's contact information:

Name: _____

Email: _____

Phone: _____

Company: _____

Address: _____

_____

PE Stamp
Sign and date over stamp