Appendix A - Submittal Checklists

1. **Conceptual Review Submittal Checklist**
2. **Landscape and Grading Permit Requirements and Checklist**
3. **Sufficiency Review Checklist**
4. **Minor Grading and Drainage Report and Plan Review Checklist**
5. **Major Grading and Drainage Report and Plan Review Checklist**
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Conceptual Design Checklist

CITY OF ASPEN ENGINEERING DEPARTMENT
GRADING AND DRAINAGE REQUIREMENTS FOR CONCEPTUAL DESIGN

DRAINAGE **REPORT** SHALL INCLUDE:

General

- □ Description of the existing site, including common location, topography, land use, ground cover, soil type, drainage pattern, and receiving system.
- □ Description of the proposed project, including changes to land use, topography, ground cover, soil type, drainage pattern and receiving system.
- □ Discussion of any previous drainage studies (i.e., project master plans) for the site that influence or are influenced by the drainage design and the mitigation plan for any negative impacts.
- □ Discussion of the drainage impact of site constraints such as streets, utilities, existing structures, and development or site plan.
- □ Describe the downstream stormwater system – size, material, condition (if known), etc.
- □ Identification of all irrigation facilities and waterways within the watershed that will influence or be influenced by the site drainage.
- □ Discussion of floodplains, wetlands, environmentally sensitive areas, geologic hazard areas (steep slopes or mudflow hazard areas) located within the site.
- □ Discussion of easements and tracts for drainage purposes, including the conditions and limitations for use.

Drainage Basins and Sub-basins

- □ Describe existing and proposed sub-basins, including ground cover, acreage, soil type, and location and method of discharge.
- ⊟ Delineate and reference sub-basins on a map with contours. Each drainage basin should be labeled with its area (in acres), runoff coefficient (C), and Q (cfs).
- □ Discuss offsite drainage patterns and impact on site under existing basin conditions and fully-developed basin conditions.
- □ Discuss pre-developed (historic) and post-developed drainage flow rates at specified point locations (should match labeled locations on plan).

Low Impact Site Design

- □ Describe what efforts have been made to reduce runoff and increase infiltration (e.g. reduce impervious area, disconnect impervious area, route runoff via landscape rather than hard infrastructure).

Hydrologic Criteria

- □ Identify runoff calculation method. Discussion and justification of other criteria or calculation methods used that are not presented in or referenced by the criteria.
- □ Identify the area, storm frequency, rainfall intensity, time of concentration, runoff coefficients, and adjustments for each sub-basin.
- □ Calculate runoff prior to the project.

- □ Calculate the post development runoff flows for each sub-basin and compare these flows to pre-development flows. Determine post development flow prior to inclusion of detention. Flow should be calculated for each location that runoff leaves the site. A map showing all drainage basins should be labeled with basin area (in acres), runoff coefficient (C), and Q (cfs).
- □ Provide calculations of the WQCV, minor event (5-yr for drywell, 5- or 10-year for storm system and detention) and major storm runoff (100yr) at specific design points.

Hydraulic Criteria

- □ Identify flow capacity of drainage facilities.
- □ Calculate culvert sizes with capacities and area of contribution.
- □ Calculate storm sewer capacity including capacity of next two downstream drainage structures.
- □ Calculate gutter capacity.
- □ Calculate storm inlet capacity.
- □ Provide open channel size.
- □ Provide volumes and release rates for detention storage facilities.

Proposed Facilities

- □ Describe proposed better site design practices (BMPs) used to treat the water quality capture volume, detention methods and outlet design with protection techniques.
- □ Provide sizing calculations and approximate locations, with drainage basins, of BMPs used to treat the water quality capture volume.

GRADING AND DRAINAGE **PLANS** SHALL INCLUDE

- □ Vicinity map with north arrow and scale.
- □ Drawings must be 24" x 36" in size.
- □ Scale of 1"=10’ to 1"=40’ or plan must be provided in sufficient detail and clarity to identify drainage flows entering and leaving the development and general drainage patterns.
- □ Benchmark and tie to the City of Aspen Survey.
- □ Name of the subdivision or project.
- □ Property map and parcel number.
- □ Date of preparation, scale, and symbol designating true north.
- □ Legend to define map symbols.
- □ Existing and proposed contours at 1-foot maximum intervals. In terrain where the slope exceeds 15%, the maximum interval is 10 feet. The contours shall extend a minimum of 100 feet beyond the property lines. **Additional topography can be obtained from the City of Aspen GIS Department. The two foot contours are acceptable.**
- □ Overall drainage area boundary and drainage sub-area boundaries for all basins on and off site.
- □ Location, elevation, and FIRM rate code for all existing floodplains within 100’ of property.
- □ Indicate the top of slope and delineate the 15’ no-touch setback.
- □ Property lines and easements with purposes noted.

- □ Existing and proposed drainage facilities and structures, roadside ditches, drainage ways, gutter flow directions, and culverts. All pertinent information such as material, size, shape, slope, and location shall also be included.
- □ Existing and proposed building footprints, streets, indicating ROW width, flow line width, curb type, sidewalk, and approximate slopes.
- □ Proposed landscaping (berms, planters, shrub beds, trees, etc.).
- □ Irrigation ditches, major drainage ways, 100-year floodplains, top of slope and 15-ft no-touch setback, environmentally sensitive areas, and geologic hazard areas.
- □ Proposed type of street flow (i.e., vertical or combination curb and gutter), roadside ditch, gutter, slope and flow directions, and cross pans.
- □ Proposed locations of storm sewers and open drainage ways, including inlets, manholes, culverts, and other appurtenances, (i.e. riprap protection). (allowable manhole spacing = 400 feet)
- □ Proposed outfall point for runoff from the developed area and facilities to convey flows to the final outfall point without damage to downstream properties.
- □ Flow path leaving the development through the downstream properties ending at a major drainage way.
- □ Location and (if known) elevations of all existing and proposed utilities affected by or affecting the drainage design.
- □ Routing of offsite drainage flow through the development.
- □ Summary Runoff Table.
- □ Discussion of easements and tracts for drainage purposes, including the conditions and limitations for use.
- □ Drywell locations (if any) - Minimum 10 feet deep, and 10 feet from property line, and 10 feet from foundation

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Landscape / Grading Permit Requirements

You do not need to apply for a Landscape/Grading Permit if **ALL** of the following exemptions are met:

- Not a Historic Property
- Not Removing Any Trees
- Not Working in the Floodplain or Stream Margin
- Not Working in the Smuggler Mountain Superfund Site
- Not Working in the 8040 Greenline Review Area
- Not Hardscaping in the Setbacks

AND

- Less than 200sq.ft. of work

OR

- Less than 1000sq.ft. of total Landscaping that does not include hardscape, or a change in grade or drainage pattern

Definition of Terms:

- **Hardscape** – in the practice of landscaping, refers to hard surfaced areas like decks, patios, walkways, and pools where the soil is no longer exposed to the surface. Hardscape also include other permanent features such as retaining walls and fire pits.
- **Landscape/Softscape** – any activity that modifies the visible features of an area of land. In the case for a landscape and grading permit, it alters features that are planted.
- **Change in Grade** – or "grading" occurs when soil material is disturbed on a site to establish a certain level, shape, or slope. In the case for a landscape and grading permit, the addition of mulch up to 4 inches is not considered "grading."

Submittal Requirements:

- Site Plan
- CMP

In Addition:

If Plan Contains Less than 1000sq.ft. of Grading or Hardscaping:

- See Minor Grading/Drainage Submittal Requirement Checklist

If Plan Contains 1000sq.ft. or More of Grading or Hardscaping:

- See Major Grading/Drainage Submittal Requirement Checklist

If Plan Contains Exterior Lighting:

- Site Lighting Plan
- Individual Specification for each fixture
- Comcheck Energy Audit – **For Commercial Projects Only**

If Plans Contain Exterior Energy Uses (Snowmelt, Pools, and Spas):

- 2009 IECC REMP Worksheet
- The Site Plan must include locations of proposed snowmelt, spas, and/or pools. It must show individual snowmelt area square footages, and total square footage requested.
  Note: Snowmelt proposed in a Right of Way (ROW) will require a separate zone, a ROW permit and a permanent encroachment license. Snowmelt may not drain to the ROW.

If Plans Contain a Firepit:

- Spec Sheet for Appliance

If Plans Contain Hardscape in The Setback:

- Structural Details Showing Improvement Height Above and Below Grade

THE CITY OF ASPEN

CITY OF ASPEN ENGINEERING DEPARTMENT

LANDSCAPE AND GRADING

PERMIT CHECKLIST

If the project will increase or disturb any impervious area (this includes adding hard surface patios, walkways, etc.) < 200SF, or disturb > ? SF of pervious area (this includes pervious pavers, flowerbeds, etc.), or does not include the repair snowmelt then an analysis of stormwater runoff via a Grading and Drainage Plan and Report are not required, unless determined by the Development Engineer to be unnecessary. Two copies of the information is required for Sufficiency Review. Three copies will be required for Building Permit Application.

NOTE: A Design Professional is not required for preparation or submittal of a Landscape and Grading permit.

LANDSCAPE AND GRADING NARRATIVE SHALL INCLUDE:

- □ Area of impervious increase or disturbance.
- □ Area of land disturbance.
- □ Description of the existing site, including common location, topography, land use, ground cover, soil type (if known), drainage pattern (if known).
- □ Description of the proposed project, including changes to land use, topography, ground cover, soil type, drainage pattern (if known).
- □ Discussion of any drainage issues (if known).

LANDSCAPE AND GRADING PLAN (Sketch Plan) SHALL INCLUDE:

The following should be provided on at least 8.5”x11” paper (24”x36” preferred).

- □ The address of the project.
- □ Date of preparation, scale, and symbol designating true north.
- □ Property lines, streets, and waterways (swales, irrigation ditches, streams, etc.).
- □ Boundary lines of project area including disturbance area, construction access, materials storage, etc.
- □ Sketch of proposed work, including calculation of disturbed area.
- □ Drainage direction (with arrows), drainage facilities on site, existing and proposed (if known).
- □ Erosion and sediment control measures plan. Erosion must be controlled, sediment cannot be allowed to leave the site, and disturbed areas must be stabilized prior to completion.

- □ Start and finish dates.

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Sufficiency Checklist

CITY OF ASPEN ENGINEERING DEPARTMENT

SUFFICIENCY REVIEW REQUIREMENTS

If the project will increase impervious area (this includes enlarging a driveway, adding hard surface patios, increasing the footprint of the house, etc.), disturb >200SF of exterior area (this includes grading, even if a structure or hard surface isn't added), or add or repair snowmelt then an engineering review will be required as part of the Building Permit or Landscape and Grading Permit Application review process. All permit applications that must receive an engineering review are required to schedule and participate in a Pre-Application Meeting with the Development Engineer. The sufficiency checklist below and any necessary supporting documents should be completed prior to this meeting, as they will be reviewed during the meeting. **The Development Engineer's signature on this checklist is required in order to submit a Building Permit Application.**

Project Address: _____

Project Common Location/Common Name:_____

Parcel ID Number: _____

Owner and Phone Number: _____

Contact and Phone Number and e-mail address: _____

1. **How much land will be disturbed? _____ acres = _____sq.ft.**
   If one acre or more is disturbed, a CDPHE Construction General Permit is required.
   Yes, Notice of Coverage has been included in the CMP. _____
   No, A statement that Notice of Coverage is not required has been included in the CMP._____

2. **How much impervious area will be disturbed? _____ sq.ft. Added? _____ sq.ft.**

3. **What is the estimated total impervious area of the site (not just the addition)?_____sq.ft.**

4. **What type of permit is being sought (Building or Landscape/Grading)?_____**

5. **What sub-basin (see Secion 1.5 of URMP) is the project located within? _____**

6. **What level of project is this – Minor or Major?_____**
   In general, the project is considered "Minor" if 200 – 1000 sq ft of disturbance/work and "Major" if > 1000 sq ft of disturbance/work.

The following information is required for the engineer's review. Please indicate if these documents have been completed and are attached. If any of these documents are not applicable, please provide an explanation in the space provided.

	Included	N/A
7. Minor Grading and Drainage Plan and Report	☐	☐
8. Major Grading and Drainage Plan and Report	☐	☐
9. Compliant City of Aspen Survey	☐	☐
10. Soils Report	☐	☐
11. Excavation Stabilization Plan	☐	☐
12. Construction Management Plan (CMP)	☐	☐
13. Public Improvement Requirements	☐	☐
14. Floodplain Development Requirements	☐	☐
15. Mudflow Analysis	☐	☐

I hereby declare the engineering information submitted in this sufficiency review for this project is sufficient for City of Aspen Building Permit Application submittal.

_____ _____

Applicant's Signature **Date**

_____ _____

City of Aspen Development Engineer's Signature **Date**

Minor Project

THE CITY OF ASPEN

CITY OF ASPEN ENGINEERING DEPARTMENT

GRADING AND DRAINAGE REQUIREMENTS FOR MINOR DESIGN

If the project will increase impervious area (this includes changing a gravel driveway to hard surface, adding hard surface patios, increasing the footprint of the house, etc.), disturb >200SF of land (this includes grading, even if a structure or hard surface is not added, as well as "scrape and replace"), or add or repair snowmelt then an analysis of stormwater runoff via a Grading and Drainage Plan and Report are required, unless determined by the Development Engineer to be unnecessary. "Minor" projects include those that add or disturb 200 – 1000 sq.ft. of soil or impervious area. One copy of the Report and one copy of the Plans is required for Sufficiency Review. Three copies of each will be required for Building Permit Application.

NOTE: A Professional Engineer is not required for preparation or submittal of a plan and report for a minor project.

REFERENCE: Use the Introduction and Chapter 8 of the Urban Runoff Management Plan to design for a minor project.

DRAINAGE REPORT (Narrative) SHALL INCLUDE:

The following should be included in a bound, narrative report.

- □ Description of the existing site, including common location, topography, land use, ground cover, soil type (if known), drainage pattern, and receiving system.
- □ Description of the proposed project, including changes to land use, topography, ground cover, soil type, drainage pattern and receiving system.
- □ Discussion of any drainage issues.
- □ Discussion of drainage basins and drainage alterations, including increases in flow, changes in direction, outfalls, etc. Note: Snowmelt cannot drain to the right-of-way.
- □ Description of downstream stormwater conveyance system – hard infrastructure (Minor (hard)) or "green" infrastructure (Minor (green)).

    - o Minor (green) – Description of water quality improvements. Improvements must be made for at least the project area. Describe what efforts have been made to reduce runoff and increase infiltration (e.g. reduce impervious area, disconnect impervious area, route runoff via landscape rather than hard infrastructure).

    - o Minor (hard) – Calculations to determine the WQCV and design a BMP that can treat that volume.

GRADING AND DRAINAGE PLAN (Sketch Plan) SHALL INCLUDE:

The following should be provided on at least 8.5"x11" paper (24"x36" preferred).

- □ Name of the subdivision or project, property map and parcel number.
- □ Date of preparation, scale, and symbol designating true north.
- □ Property lines, streets, and waterways (swales, irrigation ditches, streams, etc.).

- □ Boundary lines of project area including disturbance area, construction access, materials storage, etc.
- □ Sketch of proposed work (on topographic map if possible), including calculation of disturbed area.
- □ Drainage direction (with arrows), drainage facilities on site, existing and proposed.
- □ Location and size of BMP to treat WQCV (for Minor (hard) projects only).
- □ Erosion and sediment control measures and revegetation plan. Erosion must be controlled, sediment cannot be allowed to leave the site, and disturbed areas must be stabilized prior to completion.
- □ Start and finish dates.

Major Project

THE CITY OF ASPEN

CITY OF ASPEN ENGINEERING DEPARTMENT

GRADING AND DRAINAGE REQUIREMENTS FOR MAJOR DESIGN

If the project will increase impervious area by more than 1000 SF or 50% of the existing site imperviousness (this includes changing a gravel driveway to hard surface, adding hard surface patios, increasing the footprint of the house, etc.), disturb >1000 SF of land (this includes grading, even if a structure or hard surface is not added, as well as "scrape and replace"), or add or repair snowmelt then an analysis of stormwater runoff via a Grading and Drainage Plan and Report are required, unless determined by the Development Engineer to be unnecessary. The Plan and Report must be signed and stamped by a Colorado Professional Engineer. One copy of the Report and one copy of the Plans set is required for Sufficiency Review. Three copies of each will be required for Building Permit Application.

DRAINAGE REPORT SHALL INCLUDE:

General

- □ Signature, date, and stamp of a Colorado Professional Engineer.
- □ Description of the existing site, including common location, topography, land use, ground cover, soil type, drainage pattern, and receiving system.
- □ Description of the proposed project, including changes to land use, topography, ground cover, soil type, drainage pattern and receiving system.
- □ Discussion of any previous drainage studies (i.e., project master plans) for the site that influence or are influenced by the drainage design and the mitigation plan for any negative impacts.
- □ Discussion of the effects of adjacent drainage issues.
- □ Reference to major drainage way planning studies such as flood hazard delineation reports, master plans, and flood insurance rate maps.
- □ Discussion of the drainage impact of site constraints such as streets, utilities, existing structures, and development or site plan.
- □ Identification of all irrigation facilities and waterways within the watershed that will influence or be influenced by the site drainage.
- □ Discussion of easements and tracts for drainage purposes, including the conditions and limitations for use.
- □ Report must include printed copies of the input and output files for all computer models used for the analysis and design.
- □ Reference plan drawings as needed.

Drainage Basins and Sub-basins

- □ Describe existing and proposed sub-basins, including ground cover, acreage, soil type, and location and method of discharge.
- ⊟ Delineate and reference sub-basins on a map with contours. Each drainage basin should be labeled with its area (in acres), runoff coefficient (C), and Q (cfs).
- □ Discuss offsite drainage patterns and impact on site under existing basin conditions and fully-developed basin conditions.
- □ Discuss pre-developed/historic and post-developed drainage flow rates at specified point locations (should match labeled locations on plan).

Low Impact Site Design

- □ Describe what efforts have been made to reduce runoff and increase infiltration (e.g. reduce impervious area, disconnect impervious area, route runoff via landscape rather than hard infrastructure).

Hydrologic Criteria

- □ Identify design storm recurrence intervals.
- □ Identify design rainfall.
- □ Identify runoff calculation method.
- □ Identify detention discharge and storage calculation method.
- □ Discussion and justification of other criteria or calculation methods used that are not presented in or referenced by the criteria.
- □ Identify the area, storm frequency, rainfall intensity, time of concentration, runoff coefficients, and adjustments for each sub-basin.
- □ Calculate existing runoff or historic runoff as appropriate. Refer to Section 5.2 of the URMP.
- □ Calculate the post development runoff flows for each sub-basin and compare these flows to pre-development flows. Post development flows must not exceed pre-development flows. Determine post development flow prior to inclusion of detention. Flow should be calculated for each location that runoff leaves the site. Each drainage basin should be labeled with its area (in acres), runoff coefficient (C), and Q (cfs).
- □ Provide calculations of the WQCV, minor event (5-yr for drywell, 5- or 10-year for storm system and detention) and major storm runoff (100yr) at specific design points.
- □ Hydrographs at critical design points.

Hydraulic Criteria

- □ Identify the hydraulic design point for closed systems tied to the City's existing collection system.
- □ Identify flow capacity of drainage facilities.
- □ Calculate culvert sizes with capacities and area of contribution.
- □ Calculate storm sewer capacity including capacity of next two downstream drainage structures (max velocity 20 ft/sec, HGL 12 inches below ground , EGL below ground, minimum velocity of 5 ft/sec at half full conduit flow).
- □ Calculate gutter capacity (max velocity 10 ft/sec, allowable spread = 4 feet minor storm, 12-inch depth at flow line for major storm, n=.016 for street, n=.025 for grass)
- □ Calculate storm inlet capacity (clogging factor = 50%).
- □ Provide open channel design and calculations.
- □ Check and/or channel drop design.
- □ Calculate the downstream/outfall system capacity to the major drainage way system.

Proposed Facilities

- □ Describe proposed better site design practices (BMPs) used to treat the water quality capture volume, detention methods and outlet design with protection techniques.
- □ Provide sizing calculations and approximate locations, with drainage basins, of BMPs used to treat the water quality capture volume.
- □ Provide volumes and release rates for detention storage facilities and information on outlet works.

- □ Discussion of easements and tracts for drainage purposes, including the conditions and limitations for use.
- □ Discussion of the off-site drainage facilities needed for the conveyance of minor and major flows to the major drainage way.
- □ Provide a separate section of the report that includes a narrative of the **Operation and Maintenance** requirements of the proposed on site drainage improvements. Include a description of access for maintenance operations, maintenance schedule, and contact information for party responsible for maintenance.

GRADING AND DRAINAGE PLANS SHALL INCLUDE:

- □ Signature, date, and stamp of Colorado Professional Engineer on each plan sheet.
- □ Vicinity map with north arrow and scale.
- □ Drawings must be 24" x 36" in size.
- □ Scale of 1"=10' to 1"=40' or plan must be provided in sufficient detail and clarity to identify drainage flows entering and leaving the development and general drainage patterns.
- □ Benchmark and tie to the City of Aspen Survey.
- □ Name of the subdivision or project, property map and parcel number.
- □ Date of preparation, scale, and symbol designating true north.
- □ Legend to define map symbols.
- □ Property lines and easements with purposes noted.
- □ Existing and proposed contours at 1-foot maximum intervals. In terrain where the slope exceeds 15%, the maximum interval is 10 feet. The contours shall extend a minimum of 100 feet beyond the property lines. **Additional topography can be obtained from the City of Aspen GIS Department.**
- □ Overall drainage area boundary and drainage sub-area boundaries for all basins on and off site.
- □ Location, elevation, and FIRM rate code for all existing floodplains within 100' of property.
- □ All major drainage ways for which the 100-year floodplain and floodway have been defined shall have the 100-year floodplain and floodway delineated on the plans. This also applies to detention basins.
- □ Indicate the top of slope of the Roaring Fork River and its tributaries (Hunter Creek, Castle Creek, and Maroon Creek) and delineate the 15' no-touch setback.
- □ Existing building footprints, streets, utility locations and elevations, ROW width, flow line width, curb type, sidewalk, approximate slopes, drainage facilities and structures, irrigation ditches, roadside ditches, drainage ways, gutter flow directions, and culverts. All pertinent information such as material, size, shape, slope, and location shall also be included.
- □ Proposed building footprints, streets, utility locations and elevations, ROW width, flow line width, curb type, sidewalk, approximate slopes, drainage facilities and structures, irrigation ditches, roadside ditches, drainage ways, gutter flow directions, and culverts. All pertinent information such as material, size, shape, slope, and location shall also be included.
- □ Proposed type of street flow (i.e., vertical or combination curb and gutter), roadside ditch, gutter, slope and flow directions, and cross pans.
- □ Proposed storm sewers and open drainage ways, including inlets, manholes, culverts, and other appurtenances, (i.e. riprap protection, allowable manhole spacing = 400 ft).

- □ **Proposed landscaping (berms, planters, shrub beds, trees, etc.). Overlay the actual landscape plan onto the proposed grading and drainage plan.**
- □ Profile views for all subsurface drainage facilities showing their size, slope, lengths, design storm hydraulic grade lines (major and minor), energy grade lines, cover, details of structures and/or City Standard details, and relationship with existing utilities. (18 vertical clearance for storm from water lines, 5 foot horizontal from any utility, 7 feet below ground surface, 2 % slope minimum, 18 inch min for main, 15 inch min for lateral).
- □ Cross-sectional views of all open channels, including irrigation ditches, trickle channels, spillway structures, etc., as necessary. These views shall include applicable easement/property line/ROW boundaries and water surface elevations such as the 100-year storm depth, 2-year storm depth, major storm (100-year) freeboard, and irrigation operating level.
- □ Finished floor and grade at foundation elevations of all buildings. In residential developments also provide lot corner elevations and any grade break elevations critical to the grading concept. Show positive drainage away from structures as required by Building Code (IRC – R401.3 and IBC – 1805.3.4).
- □ Spot elevations critical to describe drainage features and their functions (e.g. inlets, cross pans, spillways, inlets/outlets of manholes, culverts, and storm sewers).
- □ Proposed outfall point for runoff from the developed area and facilities to convey flows to the final outfall point without damage to downstream properties.
- □ Routing and accumulation of flows at various critical points for the initial and major storm runoffs listed on the drawing.
- □ Routing of offsite drainage flow through the development.
- □ Flow path leaving the development through the downstream properties ending at a major drainage way.
- □ Summary Runoff Table.
- □ Natural hazards: The designation of all areas that constitute natural hazard areas including but not limited to snow slide, avalanche, mudslide, and rockslide. Show areas with slopes from 30% to 40% and areas with slopes greater than 40%. Areas with slopes from 30% to 40% and areas with slopes greater than 40% will require a slope stability study performed by the Colorado Geological Survey (800-945-0451).
- □ Civil details of dry wells, outlet structures, foundation drain sumps, custom design, etc.
- □ Erosion prevention and sediment control measures for all phases of construction, including areas of revegetation.
- □ Profile views for all subsurface drainage facilities showing their size, slope, lengths, design storm hydraulic grade lines (major and minor), cover, details of structures and/or City Standard details, and relationship with existing utilities. (18 vertical clearance for storm from water lines, 5 foot horizontal from any utility, 7 feet below ground surface, 2 % slope minimum, 18 inch min for main, 15 inch min for lateral).
- □ Cross-sectional views of all open channels, including irrigation ditches, trickle channels, spillway structures, etc., as necessary. These views shall include applicable easement/property line/ROW boundaries and water surface elevations such as the 5 or 10-year storm depth, major storm 100-year, and irrigation operating level.

Checklist C

THE CITY OF ASPEN

CITY OF ASPEN ENGINEERING DEPARTMENT

SOILS REPORT REQUIREMENTS

If a project disturbs more than 200 square feet of exterior area a Soils Report must be submitted to the Engineering Department. The following are minimum requirements for all Soils Reports:

SOILS REPORT SHALL INCLUDE:

- □ Signature, date, and stamp of Colorado Professional Geotechnical Engineer.
- □ Description of the existing site, including common location, land use, and soil type.
- □ Description of the proposed project, including changes to land use, grade, ground cover, drainage pattern and receiving system.
- □ Discussion of any previous soil studies for the site.
- □ Soil type, determined by analyses of borings performed on project site.
- □ Percolation rates, determined by a percolation test or observation of soil type performed on project site.
- □ Hydraulic conductivity. Include testing method, location and depth of tests.

Checklist E

THE CITY OF ASPEN

CITY OF ASPEN ENGINEERING DEPARTMENT

PUBLIC IMPROVEMENT REQUIREMENTS

In accordance with the City's Sidewalk, Curb and Gutter Master Plan, property owners are required to install and maintain sidewalk, curb and gutter along the street frontage adjacent to their properties. Properties within certain areas of the City are not required to install sidewalk, curb and gutter. These locations are shown on the "Sidewalk Free Zones" and the "No Curb and Gutter Zones" maps dated February 22, 2002. These maps are kept in the City Engineering Department. Call the Engineering Department at 920-5080 to find out if sidewalk or curb and gutter are required for a property.

Sidewalk, curb and gutter does not need to be installed as part of the project if (i) the property is outside of the City's sidewalk, curb and gutter zones, and (ii) the cost of installing sidewalk, curb, and gutter exceeds 50% of the project cost excluding the cost of the sidewalk curb and gutter. [For example, the project would not need to install sidewalk, curb and gutter if the project cost is $20,000 and the cost to install sidewalk curb and gutter is more than $10,000.]

General

- □ Provide a drainage study that delineates the drainage sub-basin, runoff flows, and the flow capacity of the curb and gutter.
- □ Landscaping in the landscape island (between the curb and sidewalk) needs to be coordinated with the City Parks Department. (phone: 920-5120 or 429-2035)
- □ Public improvements including pavement, sidewalk, curb and gutter plans must be stamped by a Colorado licensed professional engineer.
- □ If no curb and gutter exists on the adjacent properties, the curb and gutter needs to be designed for the adjacent property. (This is necessary in order to ensure that the location and elevation of the new curb and gutter is coordinated with the future curb and gutter on adjacent properties.

Site Plan

- □ Existing utilities and structure with appropriate stationing including: Waterline, valves, hydrants, sanitary sewer line, manholes, storm drainage facilities, telephone line including junction and control box, gas, electric, cable, fiber optic, floodways and plains, driveway locations, street lights, curb and gutter, traffic signal poles and controllers, pavement edges, trees
- □ Show the location of the sidewalk, curb and gutter on the site plan and grading plan, spot elevations in the gutter flow line every 10 feet, and the extent of new pavement.
- □ Station and elevation of all curb returns, horizontal PCs, PTs etc existing and proposed. Also at high or low point for all curbs , at inlets (including invert and 100 foot maximum intervals along the streets.
- □ Curb return radius, existing and proposed.
- □ Pedestrian access ramp locations
- □ Complete horizontal curve data (radius angle, length and tangent)
- □ All crown lines were departing from the normal cross sections (transitions to existing roadways) with appropriate transition stating elevation.

Profile

- □ All design elevations, at centerline, flow line, pipe inverts. Including water lines larger than 4 inch diameter, all distribution or collection lines under pressure and gravity lines with 6 inch or larger diameter.
- □ Existing and proposed grade, drawn and labeled
- □ Centerline stations continuous for the entire length of the street or project, with centerline stationing of all intersection streets.
- □ Existing utilities particularly where crossed, with grades and elevations
- □ Station and elevation of grade breaks, existing and proposed.
- □ Proposed vertical curves with VPI, VPC, VPT, high point or low point (not the middle ordinate) stations and elevations
- □ Proposed slope and distance for all tangent lines
- □ Proposed Curb return profiles
- □ Proposed Size, type and structural class of pipe
- □ Proposed Pipe bedding
- □ Station and elevation on all drainage and other proposed utilities
- □ Provide a profile of curb flow line showing both the existing and proposed grade.
- □ Provide cross sections across the sidewalk and/or curb and gutter every 50 feet including cross sections at both ends of the proposed sidewalk, curb and gutter.
- □ Typical Cross section(s), shown for all streets, including profile street width, ROW and cross slope.

Details

- □ The construction plans shall include adequate technical information in text format, complete design details and design calculations for special structures.

Signing and Pavement Marking

- □ A complete signing and marking plan must be submitted as apart of the design documents for review by the Engineering Department All signing and marking design must conform to MUTCD

Design Parameters

- □ Standard City details for sidewalk, curb and gutter, drive ramps, and handicap ramps are available from the City. Minimum width of sidewalk is five feet for residential, 6 feet for high density and multi-family and 8 feet for commercial. Sidewalk cross slope: 2%.
- □ Gutter should be designed to drain with a slope of 0.75% or greater.
- □ If possible, elevation of sidewalk should match the elevation of top of curb. And be placed next to the property lines.
- □ The curb radius at intersections is established in the City's Engineering Standards.

Snow Melt Systems

- □ Snowmelt systems installed within the Rights-of-Way must be maintained by the adjacent property owner. A permanent encroachment permit must be completed.

THE CITY OF ASPEN

CITY OF ASPEN ENGINEERING DEPARTMENT

GRADING AND DRAINAGE CERTIFICATE

All major projects within the City of Aspen require a Grading and Drainage Certificate following final grade, landscaping, and installation of all stormwater quality and quantity control measures for the site. Certificate of Occupancy will not be issued until Grading and Drainage Certificate has been submitted and approved by the Development Engineer. The following are the minimum requirements for a Grading and Drainage Certificate:

GRADING AND DRAINAGE CERTIFICATE SHALL INCLUDE:

- □ As-built survey
- □ A video of the subsurface drainage systems may be necessary. A video of the subsurface drainage system is required if the site drains into the City of Aspen's stormsewer infrastructure and/or if the site discharged pollutants, such as concrete, sediment, or construction debris, during construction.
- □ Maintenance Agreement for stormwater facilities such as detention systems and structural best management practices designed to treat the WQCV.
- □ Elevation Certificate if the site is in the FEMA 100-yr floodplain.
- □ Signature, date, and stamp of Colorado Professional Engineer on each plan sheet.

"I, the undersigned Registered Professional Engineer, certify that I have inspected the as-built survey data for project site: _____ and have concluded that the property will drain adequately in conformance with the drainage plan submitted and approved by the City on date: _____."

By: _____ Date: _____

PE License No. _____

As-Built Survey

- □ Signature, date, and stamp of Colorado Professional Land Surveyor on each plan sheet.
- □ Vicinity map with north arrow and scale.
- □ Drawings must be 24" x 36" in size.
- □ Scale of 1"=10' to 1"=40' or plan must be provided in sufficient detail and clarity to identify drainage flows entering and leaving the development and general drainage patterns.
- □ Benchmark and tie to the City of Aspen Survey.
- □ Name of the subdivision or project.
- □ Property map and parcel number.
- □ Date of preparation, scale, and symbol designating true north.
- □ Legend to define map symbols.
- □ Property lines and easements with purposes noted.

- □ Contours at 1-foot maximum intervals. In terrain where the slope exceeds 15%, the maximum interval is 10 feet.
- □ Drainage facilities and structures, including irrigation ditches, roadside ditches, drainage ways, gutter flow directions, and culverts. All pertinent information such as material, size, shape, slope, and location shall also be included.
- □ Building footprints, streets, utility locations, ROW width, flow line width, curb type, and sidewalks.
- □ Storm sewers and open drainage ways, including inlets, manholes, culverts, and other appurtenances. All pertinent information such as material, size, shape, slope, and location shall also be included.
- □ Cross-sectional views of all open channels, including irrigation ditches, trickle channels, spillway structures, etc., as necessary. These views shall include applicable easement/property line/ROW boundaries.
- □ Finished floor and grade at foundation elevations of all buildings. In residential developments also provide lot corner elevations and any grade break elevations critical to the grading concept. Show positive drainage away from structures as required by Building Code (IRC – R401.3 and IBC – 1805.3.4).
- □ Spot elevations critical to describe drainage features and their functions (e.g. inlets, cross pans, spillways, inlets/outlets of manholes, culverts, and storm sewers).
- □ Location and (if known) elevations of all utilities.

- □ As-Built Survey Certification Statement:

"I, the undersigned Registered Land Surveyor, hereby certify that the elevations, grading and drainage features shown of the property described as:_____ _____ were developed from surveying the property on the date of:_____ and accurately depict the elevations existing during the survey. The elevations may change subsequent to the survey due to subsidence, upheaval, erosion, acts of man or other factors. Therefore, this certificate may not accurately depict elevations, grading and drainage pattern after the date of the survey. Easements are shown per the plat unless noted otherwise. No part of this lot lies within the 100- year floodplain as defined by FEMA, except as noted."

By: Date:

_____ _____ _____

For and behalf of _____ PLS seal

STORMWATER BEST MANAGEMENT PRACTICES OPERATIONS AND MAINTENANCE AGREEMENT

City of Aspen, Colorado

THIS AGREEMENT, made and entered into this ___ day of _____, 20___, by and between (Insert Full Name of Owner)_____ hereinafter called the "**Landowner**", and the City of Aspen, Colorado, hereinafter called the "**City**".

WITNESSETH

WHEREAS, the Landowner is the owner of certain real property described as (Pitkin County tax Map/Parcel Identification Number) _____ located at _____and as more fully as follows, to wit:

also known as, _____, hereinafter called the "**Property**"; and

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, the stormwater management BMP Operations and Maintenance Plan for the property identified herein has been approved by the City, herein after called the "**Plan**", which is attached hereto as Appendix A and made part hereof, as approved by the City, provides for management of stormwater within the confines of the Property through the use of stormwater management or Best Management Practices (**BMPs**) facilities; and

WHEREAS, the City and the Landowner, its successors and assigns, agree that the health, safety, and welfare of the residents of City of Aspen, Colorado and the maintenance of water quality require that on-site stormwater management/BMP facilities be constructed and maintained on the Property; and

WHEREAS, the City requires, through implementation of the Plan from the Landowners dated _____ and attached hereto, that on-site stormwater management/BMPs as shown on the Plan be adequately constructed, operated, and maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. Construction of BMP facility by Landowner. The on-site stormwater management/BMP facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications approved by the City and identified in the Plan.

2. Duty of Operation and Maintenance of Facility. The Landowner, its successors and assigns, including any homeowners association, shall adequately operate, inspect, and maintain the stormwater management/BMP facilities as acceptable to the City and in accordance with the specific operation, inspection, and maintenance requirements noted in the Plan. Adequate operation and maintenance is herein defined as good working condition so that these facilities are performing their design functions.

3. Duty of Documentation. The Landowner, its successors and assigns, shall document inspections, maintenance, and repairs performed and provide said documentation to the City or its representatives upon request.

4. Right of Entry on Property. The Landowner, its successors and assigns, hereby grant permission to the City, its authorized agents and employees, to enter upon the Property at reasonable times and upon presentation of proper identification, and to inspect the stormwater management/BMP facilities whenever the City deems necessary. The purpose of inspection is to follow-up on suspected or reported deficiencies, to respond to citizen complaints, and/or to assure safe and proper functioning of the facilities. The City shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive with timeline to commence with the repairs if necessary.

5. Failure to Maintain. In the event the Landowner, its successors and assigns, fails to construct, operate and maintain the stormwater management/BMP facilities in good working condition acceptable to the City, the City, its authorized agents and employees, may enter upon the Property and take whatever action(s) deemed necessary to correct deficiencies identified in the inspection report and to charge the costs of such construction or repairs to the Landowner. It is expressly understood and agreed that the City is under no obligation to install, construct, or routinely maintain or repair said stormwater management/BMP facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.

6. Reimbursement by Landowner. In the event the City pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors or assigns, shall reimburse the City upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the City hereunder.

7. Duty to Inspect by City. The City, its employees or representatives, shall inspect the stormwater management/BMP facilities at a minimum of once every three years to ensure their continued and adequate functioning.

8. Release of City. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the City, its employees and designated representatives from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said City, employees, and representatives from the construction, presence, existence, operative or maintenance of the stormwater management/BMP facilities by the Landowner or City. In the event that a claim is asserted against the City, its elected officials, City Officers or employees, the City shall promptly notify the Landowner and the Landowner shall defend, at its own expense, any suit based on the claim. If any judgment or claims against the City's employees or designated representatives shall be allowed, the Landowner shall pay all costs and expenses regarding said judgment or claim.

9. Recording of Agreement running with the Property. This Agreement shall be recorded in the real property records of Pitkin County, Colorado, and shall constitute a covenant running with the Property or land, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

IN WITNESS WHEREOF the undersigned have hereunto affixed their signatures as of the date first above written.

LANDOWNER:

By:_____ Print Name: _____

State of Colorado) :ss

County of Pitkin)

The foregoing Agreement was acknowledged before me this ____day of _____, 20__,

by _____.

_____
Notary Public

My Commission Expires: _____

THE CITY OF ASPEN:

By:_____ Print Name: _____

State of Colorado) :ss

County of Pitkin)

The foregoing Agreement was acknowledged before me this ____day of _____, 20__,

by _____.

_____
Notary Public

My Commission Expires: _____