1. **System Standards.** The irrigation delivery system shall meet minimum delivery requirements for the development and shall encompass the control of wastewater, drainage water, and surface water resulting from irrigation, and shall protect and deliver the water rights of others using the same water source.

2. **Review.** The irrigation delivery system shall be reviewed and approved by the County Environmental Health Manager, considering how it affects the operation of individual sewage disposal systems on lots within and adjacent to the development. The irrigation delivery system may also be subject to review and approval by the State Engineer.

C. **Restriction Of Irrigation Methods.** Eagle County may restrict the methods of irrigation to be employed in a development in order to prevent an artificial and detrimental rise of the groundwater table under the subdivided land or adjacent lands.

D. **Irrigation Ditch Easements.** Irrigation ditch easements shall be provided for all irrigation ditches crossing the proposed development, unless the applicant can prove conclusively that they have been legally abandoned. Irrigation ditch easements shall be of a width equal to the average ditch width plus twenty (20) feet, or as otherwise recommended by the ditch owner and as approved by the Board of County Commissioners.

E. **Irrigation Ditch Maintenance.** Irrigation ditch owners shall be responsible for the maintenance of the ditch and any attendant structures unless other written agreements are entered into between the applicant and ditch owner. Such agreement(s) shall be filed as part of the final approval documents. Maintenance within the public way shall require the applicant to obtain a "Permit To Construct Within The Public Way Of Eagle County", which is administered by the Eagle County Engineer's Office.

SECTION 4-650 DRAINAGE STANDARDS

A. Purpose and Applicability.

1. **Purpose.** Land development, particularly increased impervious surface area, has been shown to degrade water quality and alter natural hydrology. The standards of this section are intended to minimize the likelihood and extent of flooding and environmental damage from uncontrolled urban runoff.

2. **Applicability.** These standards shall apply to any commercial or industrial development, any proposed subdivision or PUD, proposed development within one hundred (100) feet of a water body, and to any other development creating ten thousand (10,000) square feet or more of impervious surface area.

B. **Standards.** Stormwater runoff from all proposed development shall be managed so as to comply with the following standards: (1) No Direct Discharge; (2) Minimize Directly-Connected Impervious Areas; (3) Detain and Treat Run-off; (4) Conveyance of 100-year Storm Flow; and, (5) Other Techniques. *(am 01/04/05)*

1. **No Direct Discharge.** Stormwater discharge shall comply with one (1) of the following management options:

   a. **Vegetated Surface.** Sheetflow across at least one hundred (100) feet of stable, vegetated surface prior to discharge to any natural water body, or flow in one hundred (100) feet of non-erosive grass channels;

   b. **On Site Treatment.** On-site treatment of stormwater by use of best management practices designed to detain and infiltrate the runoff and approved as part of the Stormwater Control Plan prior to discharge to any natural water body; or *(am0 3/12/02)*

   c. **Structure.** Discharge to a stormwater conveyance structure, designed to accommodate the projected additional flows from the proposed project, with treatment by a best management practice prior to discharge into any natural water body. *(am 01/04/05)*

2. **Minimize Directly-Connected Impervious Areas.** The extent of directly-connected impervious areas shall be minimized by having runoff from fifty (50) percent of all developed impervious surfaces (rooftops, parking lots, sidewalks, etc.) drain over grass buffer strips before reaching stormwater conveyance systems. The fifty (50) percent requirement may be reduced if the outflow from the grass filter strip is directed to other stormwater treatment methods.

   a. **Examples.** Examples of other potential techniques to be used in conjunction with grass buffer strips are: infiltration devices; constructed wetlands; sand filters; replacing curb and gutter systems with low velocity grass lined swales; and, over-sizing swales, ditches and culvert crossing (such as driveway intersections) to provide additional detention storage.

   b. **Slope.** The maximum allowable slope for developed land surfaces that drain to grass buffer strips is ten (10) percent. The slope of the vegetative buffer strip itself should be no greater than five (5) percent and should be of a uniform gradient to insure evenly distributed sheet flows. Terracing and retaining wall construction may be required if necessary to maintain allowable slopes.

   c. **Formula.** The design width, or distance along the sheet flow direction, shall be the greater of the following:

      width = 8.0 feet
      0.2 L

      Where L equals the length of the flow path of the sheet flow over the upstream impervious surface.

3. **Detain and Treat Run-off.** Permanent stormwater detention facilities shall be designed to: (a) treat stormwater for pollutant removal; b) reduce peak flows to historic levels and

minimize extreme flooding; and, (c) prevent erosion of downstream channels. Detention facilities shall be designed to comply with the following standards *(am 1/4/05)*:

a. **Pollutant Removal.** Removal of pollutants shall be accomplished by providing ninety (90) percent trap efficiency for particles 0.005 mm in diameter or larger from the two (2) year, twenty-four (24) hour storm. For drainage from parking lots, vehicle maintenance facilities, or other areas with extensive vehicular use, this standard may require the use of a sand and oil grease trap or similar practice (e.g., constructed wetland, extended detention with no initial release, etc.).

b. **Peak Flow Reduction.** Peak flow reduction shall be accomplished by limiting detention pond release rates to historic (undeveloped) peak flows for all storms up to and including the twenty-five (25) year, twenty-four (24) hour design storm. In determining runoff rates, the entire area contributing runoff must be considered, including any off-site contribution. Off-site contributions shall be based on the fully developed potential based upon proposed land uses. To minimize the threat of major property damage or loss of life, all permanent stormwater detention facilities must provide for the safe passage of the one hundred (100) year storm event.

c. **Downstream Channels.** Channels downstream from the discharge of stormwater shall be protected from increased channel scour, bank instability, and erosion and sedimentation from the twenty-five (25) year design storm. The use of natural drainage ways as receiving streams is required unless it can be shown that no alternatives to changing natural drainage locations exist.

4. **Conveyance of 100-year Storm Flow.** All applications for any land development listed in Section 4-650.A.2. Applicability, shall include design provisions for the overland conveyance of the post development 100-year storm flows through the site without damage to any public or private property. *(orig 03/12/02)*

5. **Other Techniques.** Other techniques, not specifically identified, may be considered for implementation subject to the approval of the County Engineer. *(orig 01/04/05)*

C. **Stormwater Control Plan.** An applicant for any development listed in Section 4-650 A.2., Applicability, shall submit a stormwater control plan prepared by a qualified professional engineer registered in the State of Colorado. The plan shall contain the applicable information as listed in Section 4-665 C., Erosion and Sediment Control Plan, and the following additional information: *(am 01/04/05)*

1. **Calculations.** Hydrologic, hydraulic and all other calculations used to size and design drainage facilities and/or structural best management practices.

2. **Maintenance.** Maintenance measures for all proposed best management practices shall be identified including access, schedules, costs, and designation of a responsible party.

SECTION 4-660 EXCAVATION AND GRADING STANDARDS *(orig 03/12/02)*

A. Purpose and Applicability.

1. **Purpose.** The purpose of these requirements is to safeguard life, limb, property and the public welfare by regulating grading on private property.

2. **Applicability.** No person shall do any grading without first having obtained a grading permit or an exemption from a grading permit from the Eagle County Engineer.

3. **Excavating and Grading Standards**

   a. **Application.** The excavation and grading standards shall be as contained in the current edition of the International Building Code Appendix J. Grading. The current edition will be as specified in Section 3.02 Application of Chapter III of the Eagle County Land Use Regulations also known as the Building Resolution. *(am 1/4/05)*

   b. **Amendments.** The standards shall also include amendments to the current edition of the International Building Code as contained in Section 3.05 of the Building Resolution. Additional standards related to the design and placement of earthen landscape berms are also found in Section 4-230.A.10., Standards for Landscape Berms, and Section 3-340.C.4, Dimensional Limitations for a Fence, Hedge, Wall or Berm. *(am 01/04/05) (am. 05/16/06)*

   c. **Retaining Walls**. Any retaining walls, or combination of tiered retaining walls, four (4) feet in height or greater as measured from the bottom of the footing to the top of the wall, are not permitted under the grading permit and require a separate building permit for construction. Engineered drawings stamped by a Professional Engineer licensed in the State of Colorado will be required with the building permit application. Retaining walls with less than four (4) feet of height can be approved under the grading permit. *(orig. 05/01/07)*

SECTION 4-665 EROSION CONTROL STANDARDS *(am 03/12/02)*

A. Purpose and Applicability

1. **Purpose.** Siltation of rivers and other water bodies is a leading cause of water quality impairment in rivers and lakes. The purpose of these requirements is to minimize the water quality impacts resulting from land development and other land disturbing activities.

2. **Applicability.** This section shall apply to any disturbance within one hundred (100) feet of a stream, all residential development disturbing more than one-half (2) acre, all commercial

and industrial development, and all proposed subdivisions and PUD's.

B. Erosion Control Standards. The applicant shall minimize erosion of soils from a site that is being developed by complying with the following standards.

1. **Phase Construction.** Construction activities, such as clearing, grading, road construction, and utilities installation shall be phased to minimize soil exposure. Sediment trapping practices and stream and other water body protection shall be installed and stabilized before site grading or other construction is initiated.

2. **Soil Stabilization.** All disturbed areas and soil stockpiles shall be surface roughened, mulched, or seeded and mulched, or otherwise protected from erosive forces if they will remain exposed and inactive for periods longer than fourteen (14) days, or if soil will be exposed during winter, so erosion will not occur during spring snow melt. Disturbed areas shall be mulched, or seeded and mulched within seven (7) days after final grade is reached. Grass or straw mulch shall be crimped in place. On slopes steeper than twenty (20) percent, or within fifty (50) feet of any water body, exposed soils shall be hydromulched or covered with nets or mats. *(am. 05/01/07)*

3. **Permanent Revegetation.** Any disturbed area that is not built upon for one (1) year or longer shall be revegetated with a perennial, native grass mix. Within one growing season of project completion, vegetative site coverage shall be equal to or greater than seventy (70) percent of the disturbed areas.

4. **Cut and Fill Slopes.** Where cut and fill cannot be avoided, slopes shall be designed for long term stability. Permanent vegetation should be used as the preferred approach to stabilization of cut and fill areas where slopes are less than or equal to three to one (3:1). On steeper cut and fill slopes, stabilization may be attained by utilizing retaining walls, rock walls, up slope runoff diversions, slope drains or other measures appropriate for the specific situation. Step retaining walls shall be positioned such that the width of the step is half the height of the wall. Retaining walls over four (4) feet in height shall be designed by a professional engineer. Revegetation of the steps is required. In no case shall the soil surface of a cut and fill slope remain exposed without an approved method of soil stabilization.

5. **Construction in or Adjacent to a Water Body.** Construction in or directly adjacent to any water body, such as culvert or bridge installation, shall require bed and bank stabilization. This may include stream isolation through the use of coffer dams, complete containment of the stream in the area of the disturbance, stream crossing structures, or limits on the dates when in-stream work can be performed.

6. **Channels and Ditches.** New or re-routed irrigation ditches, receiving channels and streams shall be protected so that flows from the site do not cause erosion and flooding.

7. **Stormwater Runoff.** Stormwater runoff flows shall be managed to minimize erosion and sediment transport. Concentrated flows shall be diverted away from disturbed slopes. The length and steepness of disturbed slopes shall be minimized, or slope drains shall be used.

8. **Sediment and Mud Control.** Sediment and mud shall be prevented from leaving the

construction site by immediate placement of street base or construction of mud pads in access routes. Mud pads shall be at least fifty (50) feet in length and comprised of angular rock and/or a wheel washing facility. Adjacent properties shall be protected by using sediment fences, straw bales, and silt traps. Storm sewer inlets shall be protected from entry of sediment-laden water.

9. **Sediment Detention.** When the contributing drainage area, including off-site area, is greater than five (5) acres, sediment detention ponds, infiltration devices, and other management practices which store or detain runoff shall be used to treat sediment-containing runoff prior to discharge from the construction site. These practices shall be designed to treat the runoff from the two (2) year, twenty-four (24) hour storm. Sediment detention ponds, when included, shall be designed to achieve ninety (90) percent trap efficiency for all sediments of .005 mm or larger diameter. If the discharge from the pond is passed through a filtration (i.e. a constructed wetland) or infiltration device, the trap efficiency requirements may be reduced. Where the contributing drainage area is less than five (5) acres, a specific engineered design for these sediment trapping facilities shall not be required. Silt traps may be used to detain and treat runoff if the contributing drainage area is less than five (5) acres.

10. **Temporary Sediment Ponds.** Temporary sediment ponds that will be removed after successful revegetation of the site shall be designed to safely detain and release all storms up to and including the twenty-five (25) year, twenty-four (24) hour storm at its historic, pre-development rate of release. Ponds that will be left as permanent facilities shall have a capacity to safely pass the one hundred (100) year flood and meet any dam and diversion requirements of the State Engineer.

11. **Construction De-Watering.** All construction de-watering activities shall conform with the State's construction de-watering permit requirements, which include daily monitoring of total suspended solids with a thirty (30) day average concentration of no more than thirty (30) mg/l and a seven (7) day average of no more than forty-five (45) mg/l. Discharges from construction de-watering operations shall be accomplished in a manner that does not cause erosion.

12. **Inspection and Maintenance.** The applicant shall inspect all erosion and sediment control devices after any precipitation event during construction, and make any necessary repairs immediately thereafter. At a minimum, erosion and sediment control devices shall be inspected monthly. An inspection log shall be kept on-site for review by County officials until the project is complete. A copy of the inspection log sheets shall be delivered to the County at the end of each month during construction.

C. **Erosion and Sediment Control Plan.** An applicant for any development listed in Section 4-665.A.2., Applicability, shall submit an erosion and sediment control plan prepared by a qualified professional. The plan shall contain the following information:

1. **Existing Features.** Location of all existing and proposed structures and hydrologic features on the site, including intermittent water features, wetlands and the one hundred (100) year flood plain and all drainage structures or natural features on the land adjacent to the site and within a minimum of one hundred (100) feet of the site boundary line. The map must show the locations of street gutters, storm sewers, drainage channels, other water conveyance