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DEVIATION REQUEST AND DECISION FORM

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PROJECT INFORMATION

Identify the specific ECM standard which a deviation is requested:

ECM 3.3.3.B: Conformance with DCM Volume 1 Sections 6.5.2, Table 10-4 Channel Velocity.

Concrete, riprap, or soil cement linings as approved by the City/County shall be used where channel bottom velocities exceed 6.0 ft/sec. Grass lined channels shall not be used where velocity exceeds permissible velocities in Table 10-4, or the Froude number is greater than 0.9 for the 100-year storm.

DCM Volume 1 Sections 10.2.1 Soft Lined Channels

Grass lined channels are the preferred means of conveying storm water runoff because of their desirability from the standpoint of erosion protection, maintainability, accessibility, and aesthetics.

Grasses typically used for channel lining are Bermudagrass, Kentucky bluegrass, orchardgrass, redtop, Stalian ryegrass, and buffalograss.

ECM 3.3.3.C Channel Types

1. Soft-Lined Channels
2. Hard-Lined Channels

State the reason for the requested deviation:

Table 10-4 and DCM Volume 1 Section 10.2.1 do not include provisions or standards for the type of willow, sedge, rush and reed vegetation present in Cottonwood Creek within the project reach. Excellent stream stabilization exists within the subject reach of Cottonwood Creek consisting of mature dense vegetation (grasses, sedges, rushes, reeds, 6 species of willows, numerous shrubs and trees), pond embankments which support wetland vegetation and provide stormwater storage, and large boulder grade check and pond bank lining. For more than a decade, the owners, Entech Engineering, Inc. and ERO Resources Corporation consultants have observed and reported on the natural conditions of stream and riparian corridor within the site. All referenced parties support the want-to-preservation the creek in its existing stabilizeding and well-vegetated state. See reports uploaded in Applicants submittal EPC Project Numbers SP205, SF2225, SP126 and SF1829.

“Natural Channel” is not listed as a channel type in ECM 3.3.3.C

Other sections of the DCM refer to “natural channels” however it is not included as a channel type in the ECM standard.

In the DCM Open Channels and Structures 10.1 General Statement “Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable.”

DCM 2.2.1 Channelization “A stable natural channel reaches “equilibrium” over many years.”

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

Utilize the stabilizing value of the existing established pond embankments, existing willow vegetation and existing boulder placements as fully adequate stabilization and not require additional stabilization where hydraulic analysis indicates channel velocities are less than 6 fps, Froude Number values are lower than 1.0 in accordance with the criteria of DCM Section 6.5.2.

The Cottonwood Creek channel within the Eagle Rising Preliminary Plan contains two existing constructed ponds with stabilized embankments, existing boulder-creek-bed thalweg and pond embankment stabilization, along with -and- established dense willow growth that supports established wetlands. The entire wetlands -which- provide natural aesthetic qualities, wildlife habitat, erosion control, and pollutant removal. The aforementioned boulder thalweg protection is located just upstream of the northerly pond while the boulder pond protection is located along the east bank of the northerly pond. The two ponds -are themselves are stabilizing features within the creek that provide the added benefits of controlling flow rates in the creek. Also, an important engineering consideration is that the slope of the creek for the project reach is mild at 1% to 2% with an average of 1.2% as compared to other offsite creek locations in the immediate vicinity. The existing pond spillway at DP 104 will require additional riprap installation at time of final plat as noted on the Drainage Plan. This will further -to- protect the spillway during severe storm water overflows from the pond to the downstream creek drainageway. The Spillway at DP 126 has adequate existing riprap in place. If Pond 2 fills to capacity, the overflows will overtop the embankment at the southeast corner and inundate an open area at the southeast corner of the site. Overflows will then be released at the existing riprap spillway under weir flow conditions. Pondered water in the inundated area is not released at locations other than the riprap protected spillway. The ponds and creek bed have withstood repeated significantly sized rainfall events throughout decades of existence including owner observations of the large rainfall events of the 2015 -500-year to 1000-year storms and the 2023 -100-year storms.

The creek bed, wetland areas and riparian overstory of Cottonwood Creek throughout the site are well vegetated native grasses, shrubs and trees as illustrated by the photos contained in the appendix of this report. The Natural Resources Assessment by ERO Resources Corporation lists with botanic specificity the various plants found. The ERO report also contains photographic documentation of the plants and site conditions. Wetland areas feature native grasses such as Nebraska Sedge, Baltic Rush, Redtop and Broadleaf Cattail. The wetlands also contain mature, dense and well-established willows which serve to anchor the soil of the creek bed throughout the site. Specific willow species include Sandbar Willow, Greenleaf Willow, Peachleaf Willow, Strapleaf Willow, Park Willow and Shining Willow. The riparian overstory is described as containing Peachleaf Willow and Plains Cottonwood

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

trees. Shrubs present in the riparian corridor through the site include Snowberry, Wood's Rose, Golden Current, and Chokecherry. All these species act together to preserve the existing creek alignment and grades that are observed at the site and documented by photographic evidence as attached.

Supplemental information concerning permissible velocities and permissible shear stresses for channel lining materials is included in the appendix. The information includes suggested permissible values for the native grasses, willows and trees that grow in the project reach. Live willow stakes are included and listed to have permissible velocities of 3 to 10 f/sec with permissible shear stress of 2.10 to 3.10 lbs/sf. However, the supplemental information assumes that the vegetation is newly planted, as in Reed Plantings, Hardwood Tree Plantings and Live Willow Stakes. In this case, the vegetative cover throughout the site is not plantings or stakes, but well established, robust, and dense cover that has served to stabilize the creek bed and banks for decades. The upper end (and beyond) of the permissible value range applies in this project reach.

The results of the hydraulic analysis contained in this report indicate four cross-sections at two locations that exhibit channel flow velocities that approach or exceed 6 fps and/or have Froude Number values that equal or exceed 1.0. Two cross sections are located at the north pond overflow spillway and two cross sections are located at the south pond overflow spillways ~~are~~ which are ~~are~~ protected with riprap indicated on the Drainage Map contained in the MDDP Drainage Report.—The presence of dense vegetation throughout the project reach serves to provide additional stabilization. The existing boulder structure and thalweg protection, located upstream of the pond at DP 104 provides stabilization. Portions of the banks inside the DP 104 pond are lined with large boulders. The boulders have been in place for approximately 40 years and are well embedded and incorporated into the creek terrain. They appear to range in size from 3'x3'x2.5' to 7'x4.5'x5'. Based on site observation and riprap sizing calculations that show Type VL (D50 = 6") is more than adequate to remain in place at this location, it is M.V.E., Inc.'s opinion and engineering judgement, that the existing boulders adequately fulfill stabilization function and will remain in place during the 100-year rainfall event. No further improvements are needed in the creek assuming the existing vegetation is preserved. The vegetation is naturally occurring and has been in place for many years. During this time, it has survived various meteorologic cycles. Additionally, with the present level of development in the upstream watershed, the amount of runoff in this section of Cottonwood Creek is not likely to be altered in the future. Considering all these factors, the exiting vegetation is persistent and not in danger of failing. The owners will preserve and sustain the vegetation.

The allowances in Section 6.5.2 and Table 10-4 do not account for the types and condition of the vegetation present in the creek channel and are not applicable to this case. The type and quality of the existing vegetation, which consists of mature dense grasses, sedges, rushes, reeds, six species of willows, numerous shrubs and trees, are not anticipated in the allowed flow velocities as found in DCM Section 6.5.2 and Table 10-4. Furthermore, hydraulic analysis results for the channel reach comply with the provision of Section 6.5.2 except ~~where expected~~ at the two armored-pond overflow spillways, is expected and addressed with riprap protection at each spillway.

Alternative Information is provided in the form of attached Table 2 containing Permissible Velocity and Shear Stress values for Long Native Grasses, Hardwood Tree Plantings and Live Willow Stakes complete with a list of sources including documentation from U.S. Army Engineer Research and Development Center, U.S. Dept. of Transportation, Federal Highway Administration, and others.

The DCM provides that concrete, riprap, or soil cement linings as approved by the City/County shall be used where channel bottom velocities exceed 6.0 ft/sec. Grass lined channels shall not be used where velocity exceeds permissible velocities in Table 10-4 or the Froude number is greater than 0.9 for the 100-year storm. Table 10-4 does not account for the type of vegetation present in the creek throughout the project reach as stated above. Alternatively, M.V.E., Inc. recommends the allowance ~~of the~~ associated with ~~for~~ willow vegetation staking and native grasses as shown in the Table 2 that is attached ~~included~~ in the Appendix of this ~~request~~ report. In the referenced Table 2, Long Native Grasses have permissible velocities of 4 fps to 6 fps, while Live Willow Stakes have permissible velocities of up to 10 fps. Allowable Shear stresses are also noted in the cited sources of up to 3.10 lbs. per sf. Shear Stresses at HEC-RAS model section 3700, 3500, 2703, 2669, 2101, 1900, 1700, 1500, 1400, 1200, 409 and 374 exceed 3.10 lbs. per sf. However, all these locations also have velocities and Froude Number that comply ~~ies~~ with the DCM. Furthermore, the actual vegetation on the site is well established and exhibits dense growth. The existing plants possess stabilizing characteristics far beyond those of recent plant stakings. Although the hydraulic analysis of the creek reach indicates acceptable velocities in accordance with the DCM, except at pond spillways, a Deviation Request is submitted in support of the higher allowable velocities for the specific type of creek vegetation found at the site. Existing conditions at section 3500 exhibit dense willow growth and native grass vegetation that is well established. There is no evidence of erosion present at this location. Sections 2703 and 2669 is the location of the Pond 1 emergency spillway which will have riprap protection added in developed conditions. Existing conditions at sections 2101, 1900, 1700, 1500, 1400 and 1200 exhibit dense willow growth and native grass vegetation that is well established. There is no evidence of erosion present at these locations. Sections 409 and 374 is the location of the Pond 2 emergency spillway which has existing riprap protection installed. The property owners will preserve and manage ~~the~~ the creek bed and vegetation as required through the Owner's Association (an HOA) or individually in accordance with a drainage basin channel maintenance agreement with El Paso County.

Natural well-established creeks typically don't require maintenance. The creek bed and banks within this subdivision are very well established with dense vegetation as detailed above. The owners elect ECM 3.3.3.K.2, which provides that "When the lack of an access road is not considered detrimental to the maintenance and integrity of the channel, the access road can be omitted under the following conditions: • Where suitable exit-entry ramps are provided to intermediate channels with a minimum bottom width of 8 feet at roadway crossings and at other approved, needed locations to facilitate travel or maintenance of emergency vehicles in the

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

channel bottom. At a minimum, one access ramp must be provided at each end of a channel. • Where vehicular access to the channel on a maximum spacing of 1,000 feet and at other approved, needed locations is provided to small channels with a bottom width of less than 8 feet.” The proposed easements will include restrictions on the placement of new trees, fencing, or other new improvements that would prevent effective access over the easement. This access alternative allows lot line easements to serve as access pathways and omits construction of 15’ wide access roads which would unnecessarily deface and destabilize the creekside and interfere with the use and enjoyment of the private residential lots. The 15’ access road may be omitted in recognition that the available corridors through the lot line easements are adequate with regard to available travel width and the traversable terrain. See the attached Creek Access Exhibit. These access conditions meet the criteria and intent of ECM 3.3.3.K.2.

LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- The ECM standard is inapplicable to the particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

The allowances in Section 6.5.2 and Table 10-4 do not account for the types and condition of the vegetation present in the creek channel and the types of vegetation listed in 10-4 are not present at this site. are not applicable to this case.—The existing creek on this site, and potentially others in El Paso County, contains established, mature and dense stands of tall native grasses, sedges, rushes, reeds, six species of willows along with numerous shrubs and trees. The supplemental information provided with this deviation request (Table 2 in the Appendix) suggests with allowable flow velocities and shear stresses that are more closely applicable to the type of vegetation found within the subject creek reach and site. The results of hydraulic analysis using this appropriate supplemental engineering data show that all sections of the creek channel comply with the provision of Section 6.5.2. Expand Section 6.5.2 and Table 10-4 to include these plant types found in El Paso County.

The two ~~pond~~ overflow spillways at the two ponds do not contain vegetation, but instead are protected by riprap lining. ,—as expected do not and are armored.

Furthermore the U.S. Army Core of Engineers has, after staff viewing if the site, verbally recommended that the existing wetlands and natural channel and features not be disturbed, seeing no beneficial outcomes to further structural stabilization.

The application of the requested data to this project will preserve the existing stabilizing vegetation and natural terrain for the benefit of the site, natural aesthetics, ~~wildlifewildlife~~, and future lot owners.

CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

“Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable.” DCM 10.1

Allowance of the deviation is superior to the level of stabilization available from other stabilization options because it does not involve the alteration of the current natural terrain and natural features of the site. The property owners will preserve the creek bed and vegetation as required through the OA or individually as provided in the CCR’s to be recorded with the Final Plat and in accordance with a drainage basin maintenance agreement.

The existing established mature willow growth along with the existing sedges, reeds, rushes, brush, trees and native grasses currently prevent erosion of the creek to a sufficient degree as demonstrated with the photographs contained in the Appendix of this

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

request. Other existing features of the site, consisting of the two ponds and boulder placements which were installed prior to the time of current ownership, act together with the vegetation to promote stability of the creek reach. This deviation allows preservescontinuance of the existing terrain and vegetation, which provides comparable stabilizing effects as other more invasive methods, but without disturbance of the current natural environment stabilization of the creek bed and banks. Current structures on the creek include the two ponds and boulder placements. These were installed prior to the time of current ownership. It is desirable that The owners want to preserve the natural features of the existing riparian creek, wetlands and its wildlife habitat be preserved and protected. Therefore, Furthermore, the owners do not wish to see the creek destabilized or the existing terrain, plantings, and natural beauty of the creek harmed or destroyed by the mechanized interventions required to install unnecessary, functionally inferior and maintenance intensive hard drainage structures.

The deviation will not adversely affect safety or operations.

The existing vegetation already fulfills all stabilization requirements for the creek. The allowance of the deviation will not adversely affect safety or operations. The presence of the existing natural terrain and vegetation poses no additional safety risks to people or the environment. Safe and adequate access to the creek is provided within the proposed lot line easements as discussed, which allows performance of potential maintenance. These easements on the site allow physical access to the pond embankments and operation of the pond outlet works. Allowance of the deviation is superior to the level of stabilization available from other stabilization options. The property owners will preserve the creek bed and vegetation as required through an HOA or individually in accordance with a channel maintenance agreement.

The deviation will not adversely affect maintenance and its associated cost.

All observation, and preservation and management of the creek and riparian corridor within the Drainage Easement will be undertaken by the owners and the Owners Association in accordance with CCR's which are to be recorded at the time of Final Plat recording and in accordance with the a channel drainage basin maintenance agreement. The deviation will not adversely affect maintenance or maintenance costs.

It is understood that "Grass lined channels" are dependent upon continuous growth of "grass." As noted above, the native willow and other dense vegetation in place is significantly superior to grass and is already very well established. It is naturally occurring and has been in place for many decades. During this time, it has survived various meteorologic cycles from drought to overly wet seasons. Additionally, with the present level of development in the upstream watershed, the amount of runoff in this section of Cottonwood Creek is not likely to be altered in the future. Considering all these factors, the existing vegetation is vigorously persistent and not in danger of failing. The owners agree to continue to observe the waterway and to take appropriate steps to preserve the vegetation if its survival is threatened. No maintenance is anticipated at this time and is to be provided in the drainage basin maintenance agreement with El Paso County.

The deviation will not adversely affect aesthetic appearance.

"Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable." DCM 10.1

Preserving tThe natural aesthetic appearance of the site is exactly the intent of this deviation request. Granting this deviation will continue the beauty and tranquility inherent to the site with its functioning ecosystem. This includes the existing flora and fauna which remain intact and in place. Conversely, the introduction of the engineering comment request for constructed stabilization would irreparably alter the natural features of the site and harm the site's biodynamic stability and aesthetic appearance. It would be a shame if the naturally stabilizing features of the site were to be removed for the sake of installing an artificial means of accomplishing the same level of stabilization that already exists.

The deviation meets the design intent and purpose of the ECM standards.

The supporting documentation provided in this deviation request and the MDDP/Preliminary Drainage Report shows that the existing vegetation has served and will serve as the required stabilization within the creek. The purpose of the ECM standard is met.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

- The proposed deviation request meets the control measure requirements specified by the County's MS4 Permit.
- The allowance of this deviation will avoid and prevent disturbance of the creek bed and banks and therefore prevent erosion and sedimentation within the creek.
- Stormwater quality treatment for the development site will be provided as required.
- Appropriate stormwater control measures will be implemented for any land disturbance as required in accordance with an approved Grading and Erosion Control Plan.

REVIEW AND RECOMMENDATION:

Approved by the ECM Administrator

This request has been determined to have met the criteria for approval. A deviation from Section _____ of the ECM is hereby granted based on the justification provided.

Γ _____ 7

L _____ J

Denied by the ECM Administrator

This request has been determined not to have met criteria for approval. A deviation from Section _____ of the ECM is hereby denied.

Γ _____ 7

L _____ J

ECM ADMINISTRATOR COMMENTS/CONDITIONS:

1.1. PURPOSE

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

1.2. BACKGROUND

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

1.3. APPLICABLE STATUTES AND REGULATIONS

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

1.4. APPLICABILITY

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

1.5. TECHNICAL GUIDANCE

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

1.6. LIMITS OF APPROVAL

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

1.7. REVIEW FEES

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.