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DEVIATION REQUEST AND DECISION FORM

Updated: 6/26/2019

PROJECT INFORMATION

Project Name :	Grandview Reserve
Schedule No.(s) :	
Legal Description :	<p>A TRACT OF LAND BEING PORTIONS OF THE SOUTH HALF OF SECTION 21, SOUTH HALF OF SECTION 22, NORTH HALF OF SECTION 28 AND SECTION 27, TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING DESCRIBED AS FOLLOWS:</p> <p>BASIS OF BEARINGS: THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.</p> <p>COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 21; THENCE NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST ON THE EAST LINE OF SAID SECTION, A DISTANCE OF 2645.09 FEET TO THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER OF SAID SECTION 21, SAID POINT BEING THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 41 MINUTES 03 SECONDS EAST ON THE NORTH LINE OF THE SOUTH HALF OF SAID SECTION 22, A DISTANCE OF 3938.20 FEET; THENCE SOUTH 00 DEGREES 41 MINUTES 58 SECONDS EAST ON THE EAST LINE OF THE WEST HALF OF THE SOUTHEAST QUARTER OF SECTION 22, A DISTANCE OF 2117.66 FEET TO A POINT ON THE NORTHWESTERLY RIGHT OF WAY LINE OF THE ROCK ISLAND REGIONAL TRAIL AS GRANTED TO EL PASO COUNTY IN THAT WARRANTY DEED RECORDED OCTOBER 21, 1994 IN BOOK 6548 AT PAGE 892, RECORDS OF EL PASO COUNTY, COLORADO; THENCE ON SAID NORTHWESTERLY RIGHT OF WAY, THE FOLLOWING FIVE (5) COURSES:</p> <p>(1) SOUTH 45 DEGREES 55 MINUTES 49 SECONDS WEST, A DISTANCE OF 758.36 FEET TO A POINT ON THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 22;</p> <p>(2) NORTH 89 DEGREES 38 MINUTES 06 SECONDS EAST ON SAID SOUTH LINE, A DISTANCE OF 36.18 FEET;</p> <p>(3) SOUTH 45 DEGREES 55 MINUTES 49 SECONDS WEST, A DISTANCE OF 3818.92 FEET TO A POINT ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 27;</p> <p>(4) SOUTH 89 DEGREES 39 MINUTES 01 SECONDS WEST ON SAID NORTH LINE, A DISTANCE OF 36.17 FEET;</p> <p>(5) SOUTH 45 DEGREES 55 MINUTES 49 SECONDS WEST, A DISTANCE OF 855.35 FEET TO A POINT ON THE EASTERLY LINE OF SAID SECTION 28;</p>

THENCE NORTH 00 DEGREES 21 MINUTES 45 SECONDS WEST ON THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 28, A DISTANCE OF 591.16 FEET TO THE NORTHEAST CORNER OF SAID SOUTHEAST QUARTER; THENCE NORTH 00 DEGREES 21 MINUTES 38 SECONDS WEST ON THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 28, A DISTANCE OF 1319.24 FEET TO THE SOUTH LINE OF THE NORTH HALF OF THE NORTH HALF OF SAID SECTION 28; THENCE NORTH 89 DEGREES 47 MINUTES 08 SECONDS WEST ON SAID SOUTH LINE, A DISTANCE OF 4692.55 FEET TO A POINT ON THE EASTERLY RIGHT OF WAY LINE OF EXISTING EASTONVILLE ROAD (60.00 FOOT WIDE); THENCE ON SAID EASTERLY RIGHT OF WAY AS DEFINED BY CERTIFIED BOUNDARY SURVEY, AS RECORDED JULY 18, 2001 UNDER RECEPTION NO. 201900096, THE FOLLOWING FIVE (5) COURSES:

(1) ON THE ARC OF A CURVE TO THE LEFT, WHOSE CENTER BEARS NORTH 73 DEGREES 08 MINUTES 46 SECONDS WEST, HAVING A DELTA OF 24 DEGREES 31 MINUTES 32 SECONDS, A RADIUS OF 1630.00 FEET, A DISTANCE OF 697.73 FEET TO A POINT OF TANGENT;

(2) NORTH 07 DEGREES 40 MINUTES 18 SECONDS WEST, A DISTANCE OF 777.34 FEET TO A POINT OF CURVE;

(3) ON THE ARC OF A CURVE TO THE RIGHT, HAVING A DELTA OF 39 DEGREES 01 MINUTES 10 SECONDS, A RADIUS OF 1770.00 FEET, A DISTANCE OF 1205.40 FEET TO A POINT OF TANGENT;

(4) NORTH 31 DEGREES 20 MINUTES 52 SECONDS EAST, A DISTANCE OF 1517.37 FEET TO A POINT OF CURVE;

(5) ON THE ARC OF A CURVE TO THE LEFT, HAVING A DELTA OF 02 DEGREES 07 MINUTES 03 SECONDS, A RADIUS OF 1330.00 FEET, A DISTANCE OF 49.15 FEET TO A POINT ON THE NORTH LINE OF THE SOUTH HALF OF SAID SECTION 21;

THENCE SOUTH 89 DEGREES 50 MINUTES 58 SECONDS EAST ON SAID NORTH LINE, A DISTANCE OF 3635.53 FEET TO THE POINT OF BEGINNING.

APPLICANT INFORMATION

Company :	DR Horton		
Name :	Riley Hillen		
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ENGINEER INFORMATION

Company :	HR Green		
Name :	Greg Panza	Colorado P.E. Number :	37081
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Email Address :	gpanza@hrgreen.com		

OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

Signature of owner (or authorized representative)

05/10/2022

Date

Engineer's Seal, Signature
And Date of Signature



DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section **10** of the Drainage Criteria Manual (DCM) is requested.

Identify the specific DCM standard which a deviation is requested:

Section 10.5.3 Bottom Width: "Open channels with narrow bottoms are difficult to maintain and can be subjected to high flow velocities during periods of excess runoff. It is desirable to design open channels such that the bottom width is at least twice the design flow depth, but not less than eight (8) feet for channels conveying more than 400 cfs."

Section 10.5.4 Low Flow Channels: "Channel low flows, including base flows, from urban areas must be given special attention. If erosion of the bottom of the channel appears to be a potential problem, low flows shall be carried in a riprapped or concrete lined channel which generally has a minimum conveyance capacity of a 10-year duration storm. A minimum conveyance capacity of down to 10% of the 100-year storm event may be allowed if overbank conditions and scour velocities permit or only as otherwise approved by the City/County Engineer."

State the reason for the requested deviation:

Section 10.5.3 Bottom Width: The majority of the channel B (Gieck Ranch Main Stem Tributary), is to see flows of less than 400 cfs and would not require a variance from section 10.5.3 as it would not be applicable. The final 700 feet of the channel are expected to see flow rates up to approximately 550 cfs during the 100-year flow events. It is requested that a channel less than 8 feet be permitted to facilitate a design that accounts for the wide range of expected flows through the stretch of channel being designed. The final design would take into account the higher flow rate and use a lower slope and potential armoring (either through native vegetation selection or cobble) to prevent any negative degradation of the channel. The final design will target a channel that is both stable and minimizes required maintenance.

Section 10.5.4 Low Flow Channels: It is requested that a low flow channel with a capacity of approximately 70% of the 2-year flow be permitted. By designing the low flow channel to convey 70% of the 2-year event, flows in excess would be able to overflow into the floodplain. By spreading these flows out, the overall flow depth will be decreased, in turn decreasing anticipated shears and velocities expected across the channel and allowing for a more natural stream to be created. Areas of riffles and pools will be armored to prevent any degradation to the channel.

It is proposed to shift the existing channel away from its current alignment to facility the proposed land plan. The channel shift would allow for a 100-foot corridor to be dedicated to the channel and maintenance access. Initial modeling and calculations indicate the channel width at the 100-year water surface elevation + freeboard will need to be 62.76' wide. The additional ~40' width to the overall corridor will allow for maintenance access and for significant room to allow for flexibility in the naturalized channel design approach. Within the 62.76' valley the low flow channel is to meander in a fashion similar to what would be expected in an unaltered, stable reach based on the geomorphology of the project site.

Figure 1- Proposed Cross Section for MST

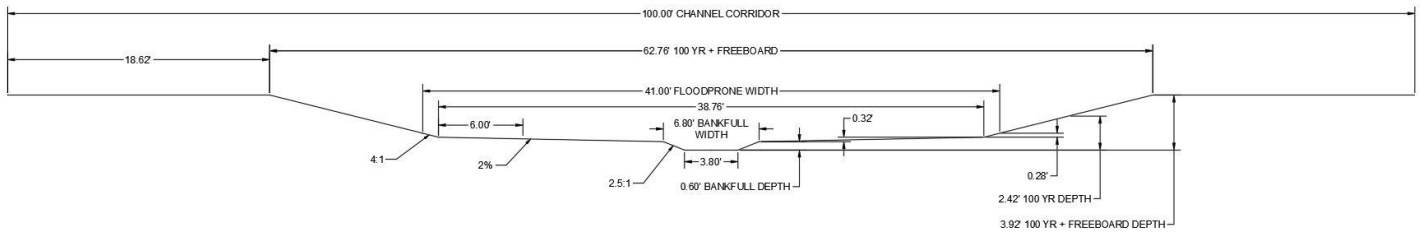


Table 1 – Proposed Existing Flows for Main Stem Tributary

STATION	2-YR STORM (cfs)	5-YR STORM (cfs)	100-YR STORM (cfs)
70+29.02	5.0	28.3	365.2
53+21.63	5.1	29.5	477.3
35+75.47	6.2	57.8	528.6
29+55.21	7.1	60.4	544
25+59.12	7.9	61.4	591.9
8+02.78	10.5	64.4	614.4
4+60.25	11.5	65.2	702.5

Table 2 - Future Flows for Main Stem Tributary Design

STATION	2-YR STORM (cfs)	70% of 2-YR (cfs)	5-YR STORM (cfs)	100-YR STORM (cfs)	10% of 100-YR (cfs)
70+29.02	5.0	3.5	28.3	365.2	36.5
56+42	5.1	3.57	29.5	477.3	47.7
38+80	6.2	4.34	57.8	528.6	52.9
30+40	7.1	4.97	60.4	544	54.4
27+15	7.9	5.53	61.4	591.9	59.2
10+50	10.5	7.35	64.4	614.4	61.4
7+45	11.5	8.05	65.2	702.5	70.3

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

Section 10.5.3 Bottom Width: It is requested that a bottom width of 3.8 feet and a bankfull width of 6.8 feet be permitted to facilitate a design that accounts for the wide range of expected flows through the stretch of channel being designed. This design variance is based upon guidance given in MHFD’s DCM volume 1 table 8-2. Based on a design flow depth of ~ 0.5 feet, it is recommended a minimum bankfull channel width of 6 feet be targeted. Through an iterative analysis it was determine that a cross sectional geometry with a bottom with of 3.8 ft, bankfull width of 6.8 feet would result in a flow depth of 0.6 feet for 70% of the 2-year event.

Section 10.5.4 Low Flow Channels: It is requested that a low flow channel with a capacity of approximately 70% of the 2-year flow be permitted. We prefer to use 70% of the 2-year event as the effective discharge channel as it approximately correlates with the 1.5-year flow interval. It is generally believed that the 1.5-year flow is the effective discharge forming flow for this region. MHFD currently states to use the greater of the two values as stated below, but recent conversations have indicated that the design consideration is based on the geographic location of the channel and soil conditions.

The design’s bankfull cross sectional geometry was estimated assuming passage of 70% of the 2-year flow (an option described in Mile Hile Flood District’s Design Manual Volume 1). Leopold (A View of the River, 1994; Fluvial processes on Geomorphology, 1992) showed very strong correlation between the effective discharge channel and field-determined bankfull geometry where the observed equilibrium channel’s spill-over point to the floodplain. This point is most often correlated to a flow return interval between 1.0-2.0 years with an average of 1.5-years (though exceptions do exist). As we do not have gauge data to perform a flow frequency analysis for this project’s channel, nor a suitable reference reach to serve as an analogue with which to scale using dimensionless ratios related to bankfull width, we have chosen to use the 2-year frequency rainfall to approximate the hydrologic condition of the watershed that would result in the 1.5-1.8-yr flow interval (approximately 70% of the 2-year flow interval).

Mile High Flood District’s (MHFD) Design Manual Volume 1 also presents the option of using 10% of the 100-yr discharge to size the bankfull channel’s capacity. In the case of this project, we have not opted for this alternative. Our concern is that the resulting channel cross sectional area derived from this alternative would be oversized and lead to sediment accumulation on the bed through time (aggradation). Aggradation occurs when insufficient stream power is present to transport sediment through the

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

channel, which can result from an oversized bankfull channel. In these cases, mid-channel bars can form which push flows into the banks increasing the risk of erosion and lateral migration of the channel. The smaller channel section also decreases the head cutting in the main thalweg, pushing the larger flows into the overbank area where greater infiltration can occur, further assisting in vegetative growth on the overbank.

Current criteria from Mile High Flood District 8.5:

The bankfull channel in naturalized channels should be sized to convey at least 70% of the future development 2-year flow or 10% of the future development 100-year flow, whichever is greater. In addition to the minimum dimensions shown in Table 8-2, a maintenance access path with a minimum per the geometry listed in Table 9-3 of the *Stream Access and Recreational Channels* chapter.

Table 8-2. Minimum dimensions for naturalized channels¹

Bankfull Channel Depth, ft	Minimum Bankfull Channel Width, ft	Minimum Floodplain Terrace Width (average each side), ft
0.5	6	6
1.0	10	8
1.5	14	10
2.0	18	12
2.5	24	16
3.0	30	20

¹ Values are based on a desired entrenchment ratio between 3 and 4. Based on several scenarios modeled in HEC-RAS, the values in this table, when paired with the criteria in Table 8-3, produce generally favorable hydraulics.

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:

Criteria Affected: DCM Sections 10.5.3 and 10.5.4

The effective discharge flow for this region is approximately equal to the 1.5-year flow interval. As the 1.5 year flow interval corresponds with approximately 70% of the 2-year event it is requested that 70% of the 2-year event be permitted to be used for sizing the bankfull channel. This would allow for an appropriately sized channel to be implemented.

Undue Hardship: By designing to 70% of the 2-year event, an appropriately sized channel would be implemented. Should a bottom width of 8' be required or a bankfull channel sized for a 10-year event, it would be oversized and there would be a higher chance of channel degradation and entrenchment within the bankfull channel that would lead to a greater maintenance cost and frequency.

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.

The deviation will allow for a channel to be created that is more appropriate for the geomorphology of the site and that will allow for the channel to be a high functioning low maintenance corridor.

The deviation will not adversely affect safety or operations.

The channel is being designed to safely manage flows anticipated to run through the site while implementing a design that will be high functioning and low maintenance.

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

The proposed design should decrease any required maintenance by targeting a stream design that would typically be found in this region, stable and high functioning.

The deviation will not adversely affect aesthetic appearance.

By implementing a natural channel design there will be a significant aesthetic benefit. It will mimic an unaltered channel and provide a net positive benefit.

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

The deviation will meet the intent and purpose of ECM standards by creating a channel that is not difficult to maintain and that is stable and not subject to excessive erosion / degradation.

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.

All construction activities will at a minimum meet control measures as described in parts I.E.3 and I.E.4 of the county's MS4 permit. These measures will help prevent pollution and degradation of state waters.

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.

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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.

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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.