



ENG-CDR19004-R3-MDDP-FDR-Redlines .pdf Markup Summary

1 (2)



Subject: EPC ENG Review
Page Index: 1
Date: 8/19/2020 3:54:39 PM
Author: dsdrice
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Also see comment letter.

Subject: Text Box
Page Index: 1
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Also see comment letter.

2 (2)




Subject:
Page Index: 2
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Subject:
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4 (2)










Subject:
Page Index: 4
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Master Development Drainage Plan – Bent Grass Residential Subdivision, by Galloway & Company, May 2019




Subject: Cloud+
Page Index: 4
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this is this report; delete


	<div><div>Subject: Cloud+</div><div>Page Index: 6</div><div>Date: 8/18/2020 5:39:20 PM</div><div>Author: dsdrice</div><div>Color: </div><div>Layer:</div><div>Space:</div><div>Page Label: 6</div></div>	Use the DBPS flows
<div>e, to the Meridian</div> <div>$Q_{100} = 83.3 \text{ cfs}$: is</div> <div>) in Bent Grass Me</div> <div>y travel to the eas</div>	<div><div>Subject:</div><div>Page Index: 6</div><div>Date: 8/18/2020 5:40:26 PM</div><div>Author: dsdrice</div><div>Color: </div><div>Layer:</div><div>Space:</div><div>Page Label: 6</div></div>	= 83.3 cfs
<div> Meadows</div> <div>$Q_5 = 29.7 \text{ cfs}$</div> <div>Design Point</div>	<div><div>Subject:</div><div>Page Index: 6</div><div>Date: 8/18/2020 5:40:30 PM</div><div>Author: dsdrice</div><div>Color: </div><div>Layer:</div><div>Space:</div><div>Page Label: 6</div></div>	= 29.7
<div>AC, $Q_5 = 7.6 \text{ cfs}$, $Q_{100} = 13.6 \text{ cfs}$</div> <div>the existing curb and gutter and</div> <div>$(Q_5 = 91.3 \text{ cfs}, Q_{100} = 103.1 \text{ cfs})$:</div> <div>and C-1. These flows all combin</div> <div>east. These flows release via air</div> <div>ler Bent Grass Meadows Drive.</div>	<div><div>Subject:</div><div>Page Index: 6</div><div>Date: 8/18/2020 5:40:47 PM</div><div>Author: dsdrice</div><div>Color: </div><div>Layer:</div><div>Space:</div><div>Page Label: 6</div></div>	91.3cfs, $Q_{100} = 103$.
<div>These flows all combine v</div> <div>east. These flows release via an ex</div> <div>der Bent Grass Meadows Drive.</div> <div>$(Q_5 = 371.3 \text{ cfs}, Q_{100} = 953.1 \text{ cfs})$: it</div> <div>and Meridian Road intersection. Flo</div> <div>from the approved DBPS, the ditch</div> <div>sed on an analysis of the existing c</div> <div>rsized for the DBPS flows. Further</div> <div>These flows are released to the</div>	<div><div>Subject:</div><div>Page Index: 6</div><div>Date: 8/18/2020 5:41:57 PM</div><div>Author: dsdrice</div><div>Color: </div><div>Layer:</div><div>Space:</div><div>Page Label: 6</div></div>	371.3cfs, $Q_{100} = 953.1$
<div>Meridian Road.</div> <div>storm events. E</div> <div>adequately and</div> <div>Analysis of the</div>	<div><div>Subject:</div><div>Page Index: 6</div><div>Date: 8/18/2020 5:42:11 PM</div><div>Author: dsdrice</div><div>Color: </div><div>Layer:</div><div>Space:</div><div>Page Label: 6</div></div>	adequately

and in Bent Grass meadows of
Design Point 12 ($Q_5 = 29.7$ cfs with the flow from Design Point Grass Meadows Drive, where t
Address DP12P?
The following basins were part
Basin H-3 (11.3 AC, $Q_5 = 3.3$ c and Bent Grass Filling No. 1. It southwesterly manner towards

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Address DP12P?



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Parcel 5301000009 also needs to detain developed and upstream flows if necessary due to downstream constraints.




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until the downstream culvert and channel constraints are resolved.


7 (4)

MEADOWS DRIVE & MERIDIAN ROAD - FURK
in the basin generally flows to the southwest, i
Point 25 ($Q_5 = 374.5$ cfs, $Q_{100} = 960.4$ cfs): is for Drive and Meridian Road Intersection. Flows l exit the project area through a set of twin culv sing conditions runoff from the west half of Me cty into the roadside channel, which flows so

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($Q_5 = 374.5$ cfs, $Q_{100} = 960.4$ cf



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Revise to state Pond SR-4 is almost complete.

the basin generally flows to t
Point 25 ($Q_5 = 374.5$ cfs, $Q_{100} = 960.4$ cfs): is for Drive and Meridian Road Intersection. Flows l exit the project area through a

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20?




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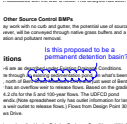
Address here or with DP15 the channel or pipe necessary (size of both options) to convey existing flows outside of Bent Grass Meadows Drive.


8 (5)



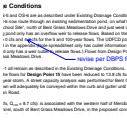
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and Bent Grass development re-routed flows



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Is this proposed to be a permanent detention basin?



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revise per DBPS flows.



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Provide developed flows



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Provide options for a long-term solution -- the channel or pipe necessary (size of both options) to convey developed flows outside of Bent Grass Meadows Drive. If water rights allow for retention, describe. State what the allowable capacity of Bent Grass Meadows Drive curb and gutter is along the north side (no overtopping unless it can be shown that flows won't enter the subdivision to the south).

293.8 cfs, Q100 = 915.7

How did flows go down?

How did flows go down?

Q105 is 915.7 cfs; is located at the northwest corner of the Bent Creek intersection. Flows from DP-15 combine with ditch flow along rd DBPs, the ditch flows are 280 and 850 cfs for the 5 and 100-yr improvements along Meridian Road. Two additional 45" x 25" s constructed under Bent Grass Meadows Drive to convey the aid

pipes are provided
w of 65.7 cfs

f 65.7

[illegible]

revise per DBPS flows RMT062

Given is the existing structure. Starting from water side and moving to the design the future proposed channel. The existing channel was designed to be a maximum depth of 8 ft and the width channel and have a maximum capacity of 50 ft wide with a maximum Froude number of 0.8. The future channel design will be an extension from the future SPMR. We combined with the addition of all side wings and the future channel width was designed to be a maximum depth with a 15 ft channel and all side wings and the future proposed slope. The new depth of the channel will be 8 ft providing a future channel for 6 ft of width. The velocity of the proposed channel is 4.0 ft/s.

The Froude number determination $F_r = V/\sqrt{gD}$ was also effective design of the future channel that will use velocity from 8 ft down to 6 ft channel. The calculations included in Appendix C illustrate that it is under consideration from the 8 ft side of the future channels. We used 4 feet down the velocity of 4.0 ft/s.

How many drop structures and what length will be required to obtain this channel? $(12 \times 12 \times 15 \text{ ft})$
 per 100 ft between SPMR and final channel?

How many drop structures and what height will be required to obtain this slope? (~12 ft total=> 1 ft per 100 ft between BGMD and Owl Place?)

improvements

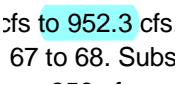





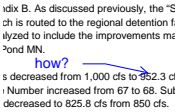

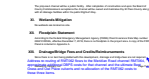

Currents are understood and improvements will need to be made in the future being proposed at this time. With the construction of the right drive, the three RCP channels will be expanded approximately 10% to 15% width. Additionally, two more 6' x 6' Hydrovac RCP pipes will be installed to increase the flow capacity of the system. The three RCP channels and sewer main (SRM) due to the expansion will be 10' ft high, 10' high, 10' high (10' x 10', 10' x 10', 10' x 10') and the SRM will be 10' x 10'.

Venly capacity for the total diverted flows.

to improve the existing channels and channel to adequately convey the necessary improvements and associated calculations are described as follows to help prevent allowing these improvements and

city (Examiner) will use to design the future proposed channel expansion to have a maximum depth of 5 ft per the criteria manual and


Verify capacity for the total diverted flows.

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	<p>Subject: Highlight</p> <p>Page Index: 10</p> <p>Date: 8/19/2020 10:09:14 AM</p> <p>Author: dsdrice</p> <p>Color: </p> <p>Layer:</p> <p>Space:</p> <p>Page Label: 10</p>	
	<p>Subject: Text Box</p> <p>Page Index: 10</p> <p>Date: 8/19/2020 10:09:23 AM</p> <p>Author: dsdrice</p> <p>Color: </p> <p>Layer:</p> <p>Space:</p> <p>Page Label: 10</p>	<p>Address the Owl Place culvert and downstream conditions and necessary easements for increased flow.</p>
	<p>Subject: Callout</p> <p>Page Index: 10</p> <p>Date: 8/19/2020 11:24:27 AM</p> <p>Author: dsdrice</p> <p>Color: </p> <p>Layer:</p> <p>Space:</p> <p>Page Label: 10</p>	<p>how?</p>
	<p>Subject: Callout</p> <p>Page Index: 10</p> <p>Date: 8/19/2020 9:17:18 AM</p> <p>Author: dsdrice</p> <p>Color: </p> <p>Layer:</p> <p>Space:</p> <p>Page Label: 10</p>	<p>Address re-routing of RMT062 flows to the Meridian Road channel RMT064, approximate additional DBPS costs for that channel and the ultimate Bent Grass and Owl Place culverts and re-allocation of the RMT062 costs to those three items.</p>

	<p>Subject: Callout</p> <p>Page Index: 11</p> <p>Date: 8/19/2020 9:18:28 AM</p> <p>Author: dsdrice</p> <p>Color: </p> <p>Layer:</p> <p>Space:</p> <p>Page Label: 11</p>	<p>and drainage facilities for flows diverted along Bent Grass Meadows Drive</p>
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Manual. Although the roadway improvements will be minimal impact on the downstream conditions and determined to be undersized. Although development recommendations are made within the Manual, the channel will ultimately be publicly owned or County.


Springtown County of El Paso Drainage Criteria Manual Manual, Volume 2, City of Colorado Springs, No

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Meridian Road

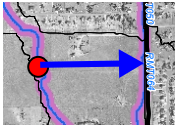
20 (1)




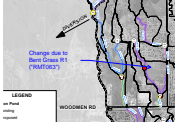
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Page Index: 20
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Replace Figure 3-13 (with prev. redlines) and add 3-12 if desired

21 (4)

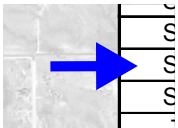



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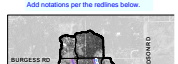



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Change due to Bent Grass R1 ("RMT063")

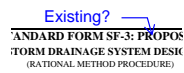


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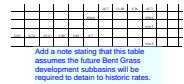
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Add notations per the redlines below.



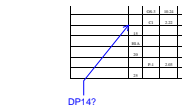
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Existing?



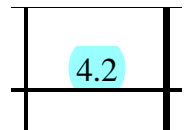
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Add a note stating that this table assumes the future Bent Grass development subbasins will be required to detain to historic rates.



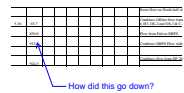
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DP14?



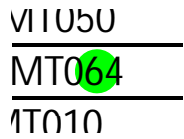
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4.2




Subject: Callout
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How did this go down?




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851.9
847.0
206.3

Subject: Highlight
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VIIOTU
MT062
AT060a


Subject: Highlight
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99.3
99.2
46.8

Subject: Highlight
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80 (1)

HY-8 Culvert Analysis Report
Provide for BGMD and Owl Place


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Author: dsdrice
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Provide for BGMD and Owl Place

86 (1)

on: 6527.34 ft
width: 3'
study: New Ellip Culverts for Offsite Flow
- Elliptical
45.00 ft
20.00 ft
at: Concrete
spacing: 0.0130
straight
width: Square Edge with Headwall
type: None


Verify based on hydrology comments

Subject: Callout
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Author: dsdrice
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Verify based on hydrology comments


89 (1)



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228 acres or run ponds in series with M2? Note that this result will differ from SCS method calculation and is for comparison purposes.




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Author: dsdrice
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26?

Minor Storm

29.0

6.0


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Page Index: 92
Date: 8/19/2020 10:37:44 AM
Author: dsdrice
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29.0

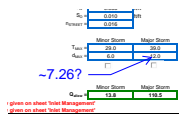
39.0


12.0



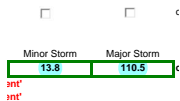
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12.0



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Date: 8/19/2020 10:39:16 AM
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~7.26?



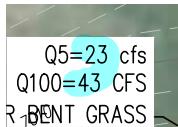
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13.8 110.5

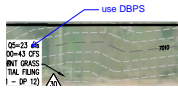
Also provide existing and proposed plans for the whole development as discussed previously. (Copy from approved Filing 2 report)


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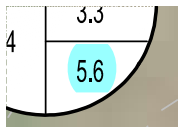
Also provide existing and proposed plans for the whole development as discussed previously.
(Copy from approved Filing 2 report)




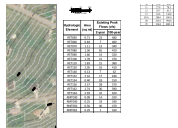
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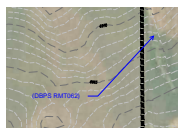
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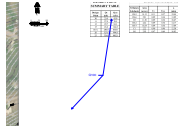
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Subject: Callout (DBPS RMT062)
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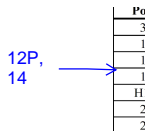



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Subject: Callout
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Q100



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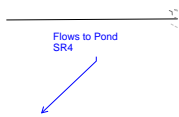
12P, 14




Subject: Cloud+
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These don't match DBPS; use DBPS flows or provide analysis/model using the DBPS methodology (rainfall depths, initial abstraction, hyetograph, etc).


112 (2)



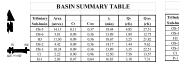
Subject: Callout
Page Index: 112
Date: 8/19/2020 12:06:51 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 112

Flows to Pond SR4




Subject: Callout
Page Index: 112
Date: 8/19/2020 12:08:01 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 112


Label the flows from the west



Basin Summary Table thumbnail showing columns: Station, Basin, Area, Elev, Slope, etc.

Subject: Snapshot
Page Index: 113
Date: 8/18/2020 5:20:16 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 113

Existing

Subject: Text Box
Page Index: 113
Date: 8/18/2020 5:20:46 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 113


Existing

Developed

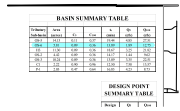
BASIN SUMMAR




Basin Summary Table thumbnail showing columns: Station, Basin, Area, Elev, Slope, etc.

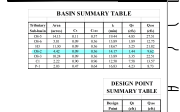
Subject: Text Box
Page Index: 113
Date: 8/18/2020 5:21:06 PM
Author: dsdrice
Color: 
Layer:
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Page Label: 113

Developed




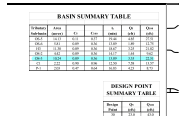
Basin Summary Table and Design Point Summary Table thumbnails showing columns: Station, Basin, Area, Elev, Slope, etc.

Subject:
Page Index: 113
Date: 8/18/2020 5:21:41 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 113




Basin Summary Table and Design Point Summary Table thumbnails showing columns: Station, Basin, Area, Elev, Slope, etc.


Subject:
Page Index: 113
Date: 8/18/2020 5:21:48 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 113

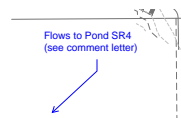


Basin Summary Table and Design Point Summary Table thumbnails showing columns: Station, Basin, Area, Elev, Slope, etc.

Subject:
Page Index: 113
Date: 8/18/2020 5:21:52 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 113

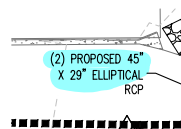
1	4.9	27.5
2	6.7	40.3
P	0.0	4.2
5	13.8	65.7
A	280.0	850.0
3	293.8	915.7
5	298.1	924.5


Subject:
Page Index: 114
Date: 8/19/2020 12:09:36 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 114

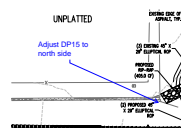


Subject: Callout
Page Index: 114
Date: 8/19/2020 12:10:41 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 114

Flows to Pond SR4 (see comment letter)

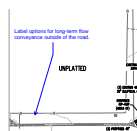



Subject:
Page Index: 114
Date: 8/19/2020 12:11:49 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 114



Subject: Callout
Page Index: 114
Date: 8/19/2020 12:14:06 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 114

Adjust DP15 to north side



Subject: Callout
Page Index: 114
Date: 8/19/2020 12:14:59 PM
Author: dsdrice
Color: 
Layer:
Space:
Page Label: 114

Label options for long-term flow conveyance outside of the road.