Galloway
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July 27, 2020

El Paso County Development Services Department
Attn: Ms. Kari Parsons
2880 International Circle
Colorado Springs, CO 80910

SUBJECT: Comment Response Letter – Meridian Road (CDR-19-004)

Dear Ms. Parsons,

Please see the following responses in ***bold and italics*** for the 2nd review of Bent Grass Residential Filing No. 2.

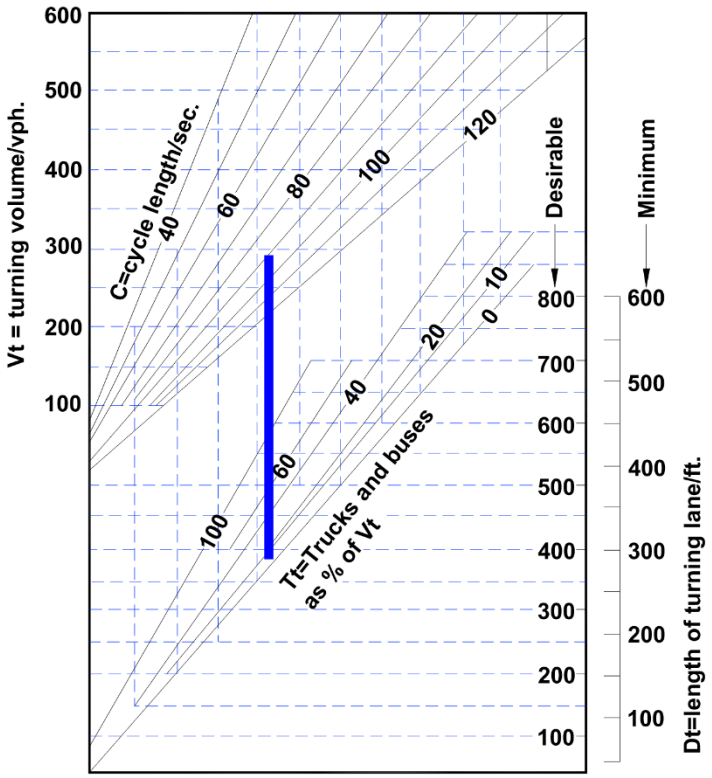
General / Letter of Intent

1. See Letter of Intent redlines. **Partially resolved; see updated LOI redlines.**
   Response: Redlines on LOI addressed – see responses on separate comment response to LOI redlines.

Transportation / Traffic Impact Study (TIS)

1. See TIS redlines. **Partially resolved; see updated TIS redlines.**
   Response: Redlines on TIS addressed – see responses on separate comment response to TIS redlines.
2. **Resolved.**
3. **Resolved.**
4. **Resolved.**
5. Verify that sufficient length is provided for the southbound decel. lane at Bent Grass Meadows. Reference ECM Figure 2-27 (copied below) as used with the most recent traffic study volumes. Confirm whether the decel. only length (530'-600'?) or taper plus storage length (240'+400'?) is used in recommendations. **Unresolved; address in the TIS.**
   Response: Storage length is not needed for right-turn deceleration lanes. ECM Figure 2-27 is intended for LEFT-TURN LANES (as per attached documentation). The current right-turn lane meets criteria.

Figure 2-27. Required Storage Lengths for Signal-Controlled Intersections



6. Queuing and blocking at the 7-11 access was analyzed for 50% of Bent Grass East development; include Bent Grass Residential 2. It appears that the access needs to be closed with the Meridian / BGM intersection improvements. **See redlines; if the access is to remain open in any configuration additional raised islands are required.**
   Response: The 7-11 access is now planned to be closed.

<u>MDDP</u> ***(Note: moved from SF-19-014)***

1. **Resolved.**
2. Address any differences in the proposed design from the DBPS, including the DBPS regional pond that is identified on this site but proposed not to be constructed. Changes may require a DBPS addendum and drainage board approval. Partially resolved;
   - **a. Resolved.**
   - b. County maintenance and drainage fee reimbursement for constructed improvements will be dependent on Drainage Board approval of a DBPS addendum. It is recommended that an information package be assembled for initial Drainage Board consideration.

   Response: Noted. If determined DBPS addendum needed, will address.

3. **Resolved.**
4. See MDDP redlines. Partially resolved; see updated redlines. *Partially resolved; see updated redlines.* Partially resolved; see updated redlines. ***Partially resolved; see updated redlines. Include the Pond WU HEC-HMS and Stage-storage-discharge pages from the FDR and the FDR developed drainage plan (for information) in the MDDP. The Proposed Drainage Plan in the MDDP should be updated to include current planning information (drainage tracts).***
   Response: HMS has been updated and included in appendix.

5. Provide HEC-HMS modeling for the Pond WU inflows and outflows with the proposed development and outlet structure revisions. *Partially resolved; provide the electronic model and additional input information per redlines.* Provide electronic model. ***Resolved (model will be reviewed with next MDDP submittal).***
   Response: Noted. Updated model has been provided in submittal package.

6. Split flow design of the Pond WU inlet features needs to be discussed *further*. County staff is awaiting input from USACE regarding the wetlands. If revisions to simplify the design and save construction costs and maintenance are possible they will be discussed. This will not require revisions to the MDDP.
   Response: Noted

Final Drainage Report / Drainage Plans

1. See FDR redlines. **Partially resolved; see updated redlines.**
   Response: Responses to FDR redlines have been included.

2. Address the unresolved diversion by Bent Grass Residential Filing No 1 assumed to flow east in Bent Grass Meadows Drive east to Meridian Road. If the diverted flow is conveyed to the culverts under Bent Grass Meadows Drive, the culverts need to be sized for the increased flows. This was previously commented on with the BGR2 (SF-19-014) project, with the question of whether the flows would be diverted to the east or to the west. In either case additional downstream easements also appear to be required. County Staff is supportive of a DBPS amendment to make the necessary culverts under BGM Drive reimbursable if the developer or district constructs them. Discuss with Staff (Elizabeth Nijkamp or Jeff Rice). **Partially resolved; see redlines. Address road conveyance capacity and what the anticipated ditch or storm drain design should be if the road does not have adequate capacity or grade to convey the diverted flows to Meridian Road. (UDFCD street capacity calculation sheet in the previous MDDP shows capacity of 23 cfs per side – verify road grade and additional conveyance need.)**
   Response: Spreadsheet for road conveyance has been included in report. Offsite flows have been addressed in report.

3. Justification needs to be provided for any increase in runoff from the proposed additional pavement to downstream properties. Address whether the proposed improvements will increase flows (it is assumed that times of concentration for the site and the upstream basin would not coincide?). There appears to be both existing (Pond MN) and proposed (Pond SR4) offsite detention and water quality facilities that should be discussed in the report. Show the regional facilities on a map ~~(the DBPS maps provided are not legible)~~. **Partially resolved; see redlines.**
   Response: Pond MN and SR4 has been included in report discussion. HMS model has been updated and provided in report appendix.

4. Provide the new PBMP Applicability Form…**Partially resolved; see redlines.**
   Response: Updated

Construction Plans / Geotechnical Issues

1. See cursory CD redlines. **Partially resolved; see updated CD redlines.**
   Response: CD Redlines addressed. See responses on separate document.

2. Show additional auxiliary lane construction as applicable per TIS revisions (comments above). **Unresolved (TIS comment #5).**
   Response: Storage length is not needed for right-turn deceleration lanes. See response to TIS Comment #5.

3. **through 6 – Resolved.**

7. Signal plans were not included; include with the next review. Additional comments on signal plans may be provided by EPC DPW. **See Signal Plan redlines.**
   Response: Redlines on Signal Plan addressed – see responses on separate comment response to Signal Plan redlines.
   a. **Resolved.**
   b. **Resolved.**
8. Note: A soils/geotechnical investigation as appropriate for roadway and drainage construction (see ECM Section 2.2.6) will be required in conjunction with the necessary pavement design. **Resolved (not reviewed at this time).**
9. **Note: Any Signal Plan comments from EPC Traffic Staff will be forwarded when available.**
   Response: Noted.

Grading and Erosion Control Plan / SWMP

1. GEC and SWMP checklists are required to be provided by the design engineer. Provide with the next submittal. Instructions are provided below the list of attachments. **See Stormwater redlines.**
   Response: GEC and SWMP checklist have been revised. See responses on separate document.

2. **Resolved.**

Financial Assurance Estimate (FAE) Form / Other

1. See FAE redlines; verify highlighted items and values. **Partially resolved; see updated FAE redlines.**
   Response: FAE Redlines addressed. See response on separate document.

2. **Resolved.**
3. Verify quantities based on revisions to CDs. **Verify if channel stabilization is added.**
   Response: Channel stabilization added to GEC and included on revised FAE.

4. **Provide mulching quantities to match seeding items unless blanketing is being used on some or all reseeding areas.**
   Response: Revised FAE to show matching quantities for seeding and mulching.

Attachments/Electronic Files

1. Comment Responses – TIS
2. Comment Responses – FDR/MDDP
3. Comment Responses – CD's
4. Comment Responses – Traffic Signal Plans
5. Comment Responses – LOI
6. Comment Responses – ESQCP
7. Comment Responses – FAE
8. Comment Responses – PBMP Applicability Form
9. Comment Responses – GEC
10. Comment Responses – GEC Checklist
11. Comment Responses – SWMP
12. Comment Responses – SWMP Checklist

COMMENT RESPONSES – TIS

LSC TRANSPORTATION CONSULTANTS, INC.
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Colorado Springs, CO 80909
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E-mail: lsc@lsctrans.com
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Provide signature page. 1

Engineering Review
07/17/2020 12:58:57 PM
dsdrice
JeffRice@elpasoco.com
(719) 520-7877
EPC Planning & Community Development Department
2

Also see comment letter 3

May 12, 2020

Bent Grass Metro District
c/o Randy Case II
102 East Pikes Peak Avenue, #200
Colorado Springs, CO 80903

RE: Bent Grass Meadows Drive & Meridian Road
El Paso County, Colorado
Updated Transportation Memorandum
LSC #194900

Dear Randy:

LSC Transportation Consultants, Inc. has prepared this updated traffic impact study for the intersection of Bent Grass Meadows Drive & Meridian Road in El Paso County, Colorado. The study area is shown in Figure 1. LSC has completed the following studies in the vicinity of the site:

Bent Grass Subdivision PUD Traffic Impact Analysis - October 6, 2006
Bent Grass East Commercial – Preliminary Plan - January 25, 2013
Bent Grass East Commercial – Report Supplement #2 - March 14, 2013
Bent Grass Subdivision Filing 1 Updated Traffic Impact Analysis - July 14, 2014
Bent Grass East Commercial Filing No. 2 Updated Traffic Impact Analysis - July 17, 2014.
Falcon Dental East Commercial Filing No. 2A - March 7, 2016
Bent Grass Meadows Drive/Meridian Road Traffic Signal Warrant Analysis - October 2, 2017
Bent Grass Residential Filing No. 2 Traffic Impact Study – April 17, 2020

REPORT CONTENTS

The report contains the following:

- The existing roadway and traffic conditions in the site's vicinity including the roadway widths, surface conditions, lane geometries, traffic controls, and posted speed limits, etc.
- The existing traffic volumes on the study area roadways
- The projected short-term traffic volumes on the study area roadways following the completion of Bent Grass Meadows Drive between the Woodmen frontage road and Meridian road

LSC Responses to TIS Redline Comments on the Meridian & Bent Grass Meadows TIS Report

Page: 1

Number: 1 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:59:46

Provide signature page.

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:16:14

A signature page is included with the updated memorandum as requested

Number: 2 Author: dsdrice Subject: EPC ENG Review Date: 7/17/2020 13:43:19

Number: 3 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:59:22

Also see comment letter

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:16:43

See response in separate document

- The projected average weekday and peak-hour vehicle-trips to be generated by the site at buildout
- The assignment of the projected additional study area site-generated traffic volumes to the study area roadways and intersections
- The projected total traffic volumes on the study area roadway network
- The projected levels of service at the intersections of Meridian Road/Bent Grass Meadows Drive and Meridian Park Drive/Bent Grass Meadows Drive at the site access point to Bent Grass Meadows Drive
- A traffic signal warrant analysis of the intersection of Meridian Road/Bent Grass Meadows Drive
- A vehicle queueing analysis at the key study area intersections
- Recommendations for all necessary short-term intersection improvements and phasing of these improvements including the potential closure of or restrictions to the existing 7-Eleven access to Bent Grass Meadows

LAND USE

approved for 178
Single Family DU

Figures 2a and 2b show the existing and future land uses served by the section of Bent Grass Meadows Drive in the area just west of Meridian Road. The area south of Bent Grass Meadows Drive includes 104 existing single-family homes that are part of Bent Grass Residential Filing No 1, the Bent Grass Residential Filing No. 2 development currently under review, and the Bent Grass East Commercial development. There is an existing mobile home with accompanying sheds and utility garages just north the Bent Grass Residential Filing 1. There are also two vacant parcels just northwest of the intersection of Meridian/Bent Grass Meadows with a total area of 7.94 acres. Although there are no known plans to develop these parcels at this time, previous studies have assumed they would be developed with a mix of retail and office uses.

The first phase of the Bent Grass Filing No. 2 residential development will consist of just under 50 dwelling units. The plan is to move forward with the 48-lot initial phase while the intersection improvement described herein are completed.

The Bent Grass East Commercial development has been divided into nine traffic analysis zones. The location of each zone is shown in Figure 2. The existing and future land uses assumed for each zone are shown in Table 1.

The Bent Grass East Commercial development is partially developed with a gas station with convenience stone, a veterinary clinic, and a dental clinic. Plans have been approved to expand the veterinary clinic from 4,171 square feet to 8,342 and to provide additional parking for the dental clinic.

There is currently one vacant lot east of Meridian Park Drive, Lot 1A Bent Grass East Commercial Filing 2A, and one vacant lot west of Meridian Park Drive, Tract BB Bent Grass East Commercial Filing 2B. The south half of Tract BB is planned to be subdivided into four lots. Figure 3 shows the site plan for this area. Access for these lots is planned to Meridian Park Drive aligning with the

Page: 2

Number: 1 Author: dsdrice Subject: Cloud+ Date: 7/17/2020 13:02:10

approved for 178 Single Family DU

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:25:20

The text of the updated memorandum has been modified to reflect the approval of Bent Grass Residential Filing No. 2.

> *C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 [from the MUTCD] (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.*

The Colorado State Patrol provided LSC with crash data for the intersection of Bent Grass Meadows Drive and Meridian Road from 2015 through November 2018. From December 2017 to November 2018 there were ten reported crashes at this intersection. Eight of the crashes involved an eastbound left-turning vehicle and a southbound through vehicle. The remaining two crashes involved a northbound left-turning vehicle and a southbound through vehicle. In one of these crashes an eastbound left-turning vehicle waiting in the Meridian Road median blocked the line of sight for the northbound left-turning vehicle. All ten of these crashes would be considered susceptible to correction by a traffic control signal. A copy of these data are attached for reference.

Based on analysis of the available data, item B above has been satisfied as five or more crashes susceptible to correction by a traffic control signal were reported in a twelve-month period. Item C is also currently satisfied. Item A would likely need to be discussed with El Paso County. This is the final remaining item before the warrant is satisfied. 1

Have there been crashes at the 7-11 access?

ALTERNATIVE INTERSECTION TRAFFIC CONTROL

Per El Paso County requirement, the following are three potential alternatives to a "conventional," signalized, full-movement intersection, for which analysis results are presented in the preceding paragraph. These include modern roundabout, unsignalized "channelized-T" type intersection, and a "channelized-T" type intersection with a directional traffic signal.

Modern Roundabout Intersection

A modern roundabout intersection at Bent Grass Meadows Drive/Meridian Road would be a multi-lane roundabout.

Advantages

- The delay for the side-street left turn (eastbound approach) would improve from LOS F to LOS C in the short term.
- Generally, modern roundabouts have safety advantages over signal-controlled intersections. This is because crashes tend to be lower speed, there are fewer conflict points, and the types (angle) of crashes tend to be those which generally result in less

Page: 9

Number: 1 Author: dsdrice Subject: Callout Date: 7/17/2020 13:29:39

Have there been crashes at the 7-11 access?

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:25:48

This access is now planned to be closed so crash history data was not requested

entered into the Synchro model. The intersection of Bent Grass Meadows/Meridian was modeled as a signal-controlled intersection. The simulation was run five times. Additional traffic was added until the eastbound left-turn queue approaching Meridian Road was projected to overflow the existing turn lane, the westbound left-turn lane approaching the 7-Eleven access was projected to overflow the existing turn lane, and/or the eastbound right-turn queue approaching Meridian Road blocked the 7-Eleven access. The queuing reports are attached.

When 113 entering and 63 exiting vehicles (representing approximately 50 percent development of the currently vacant parcels within Bent Grass East Commercial) were added to the projected 2020 background traffic volumes shown in Figure 5, the westbound left-turn queue approaching the 7-Eleven access is projected to exceed the existing turn-lane length. The eastbound right-turn queue approaching Meridian Road is also projected to extend to the 7-Eleven access.

With Conversion of 7-Eleven Access to Exit Only and Right-Out Only

A queuing analysis was performed using Synchro/SimTraffic for Bent Grass Meadows Drive between Meridian Road and the proposed west site access. The 2021 total morning and afternoon peak-hour traffic volumes were entered into the Synchro model. The simulation was run five times. The queueing analysis assumes dual eastbound left-turn lanes and an exclusive eastbound right-turn lane with southbound acceleration lane on Bent Grass Meadows Drive approaching Meridian Drive. The queuing reports are attached.

Based on the projected 2021 total traffic volumes the projected maximum eastbound left-turn queue on Bent Grass Meadows Drive approaching Meridian Road is 128 feet. The maximum westbound left-turn queue approaching Meridian Park Drive is 130 feet. These queues could be accommodated if Bent Grass Meadows Drive were restriped as shown in Figure 11. raised island? 1

The projected maximum northbound left-turn queue on Meridian Road approaching Bent Grass Meadows Drive is 170 feet. The existing northbound left-turn lane at this intersection is about 700 feet long. 2

See comment letter regarding SB right turn at BGM Dr. and ECM Figure 2-27 (provide).

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- Development of the currently vacant parcels within Bent Grass East Commercial can be expected to generate an additional 4,595 vehicle-trips on the average weekday, with about half entering and half exiting in a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 212 additional vehicles would enter and 126 additional vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 228 additional vehicles would enter and 233 additional vehicles would exit the site.

Page: 12

Number: 1 Author: dsdrice Subject: Callout Date: 7/17/2020 13:35:39

raised island?

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:26:20

The 7-Eleven access is planned to be closed so a raised island will not be needed

Number: 2 Author: dsdrice Subject: Text Box Date: 7/17/2020 13:35:47

See comment letter regarding SB right turn at BGM Dr. and ECM Figure 2-27 (provide).

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:31:05

Storage length is not needed for right-turn deceleration lanes. ECM Figure 2-27 is intended for LEFT TURN LANES (as per attached documentation). The current right-turn lane meets criteria.

Table 5
Short-Term (Currently Proposed) & Future Improvements
Meridian/Bent Grass Meadows Drive & Bent Grass Meadows Drive/Meridian Park Drive

	Improvement	Description	Trigger	Timing
Currently-Proposed Short Term Roadway Improvements (see Figure 11 for reference)				
A	Signalize Meridian/Bent Grass Meadows	Remove existing stop-sign and replace with traffic signal control.	When warrant(s) are met -- 2 of the 3 conditions of the "Crash Experience" warrant are currently met. The current number of reported crashes (susceptible to correction with a signal) exceeds the threshold as do the associated traffic volume thresholds.	With opening of the approved expansion of the veterinary clinic or Once El Paso County determines that the remaining condition within the Crash Experience Warrant has been met (determines that alternatives have failed to reduce crash frequency) and determines that a signal should be installed.
B	Southbound Right-turn acceleration lane on Meridian Road south from Bent Grass Meadows	ECM criteria indicates the acceleration lane would need to be 960 feet long plus a 222-foot taper based on the posted speed of 55 mph. Note that Owl Place is located approximately one-quarter mile south of Bent Grass Meadows Drive (centerline spacing). Prop. continuous to Owl Pl. 1	ECM turning volume threshold has been exceeded.	With this project
C	Widen the south side of Bent Grass Meadows Boulevard to allow for a three-lane eastbound approach at Meridian/Bent Grass Meadows Boulevard.	Widen Bent Grass Meadows Boulevard on the south side between the east end of the curb & gutter (just east of the 7-11 access) and Meridian Road; reconfigure the southwest corner radius; install guard rail as necessary. Restripe for dual left turn lanes and one right turn lane eastbound (the dual left can only be placed into operation once the signal is operational). If this improvement is completed before the signal is installed, temporarily stripe out the middle (left turn) lane.	To Allow for eastbound dual Left Turn lanes once the intersection is signalized.	With this project
D	Restripe the painted center median on Bent Grass Meadows Dr. to eliminate the westbound left into 7-11 2 A raised median is required if the access remains open /ROO.	Remove the striping for the left-turn bay at the 7-Eleven access, restripe for two sets of dual yellow lines as shown in Figure 11.	With C	With this project
E	7-11 Access - Add Signs and Markings to restrict the access to EXIT ONLY and Right Turn ONLY (for exiting traffic)	3 A raised pork chop island and raised median is required if the access remains open as ROO.	With D	With this project
F	Modify Pavement Markings to extend WB LT at Meridian Park Drive		With D	With this project
Future Roadway Improvements (See Figure 12 for reference)				
G	Bent Grass Meadows Drive - future north side widening of the short section just west of Meridian Road.	Future North Side Widening - Widen Bent Grass Meadows to ultimate width on the north side between Meridian Road and the point where the north side curb and gutter begins; This would be accomplished with the upgrade/extension of the culvert on north side; reconfigure the corner radius to match, relocate signal pole if necessary; adjust guard rail if necessary; add corner pedestrian ramps if applicable.	Future project - TBD with future TIS reports	Future project - TBD with future TIS reports
H	Future additional Improvements on the SW corner following culvert extension/upgrade	Depending on the scope of the culvert project, extend sidewalk; relocate signal pole if necessary; relocate or remove guard rail and add corner pedestrian ramps if applicable.	Future project - Likely with G	Future project - Likely with G
I	Future closure of 7-Eleven Access to Bent Grass Meadows Drive	Close the access	If/when the eastbound right-turn queue approaching Meridian Road blocks the access **and/or** if motorists exiting from the 7-Eleven access and turning into the eastbound left-turn lanes approaching Meridian Road regularly impede/block the adjacent eastbound right-turn lane approaching Meridian Road.	Estimated Timing (may be reevaluated later): 'With 50% percent development of the remaining vacant parcels within Bent Grass East Commercial beyond the approved expansion of the veterinary clinic and expansion of parking for the dental clinic.
J	Future - Potential addition of a westbound right turn bay in conjunction with a future north-side access.	Westbound right turn lane on the north side of Bent Grass Meadows Drive just west of the Bent Grass Meadows/Meridian Park Drive intersection.	A westbound right turn volume of 50 vehicles per hour or if otherwise recommended in a future TIS report.	To be determined based on a future traffic report for future development on the north side.
K	Future center median striping modifications on Bent Grass Meadows Drive just west of Meridian Park Drive.	Future - modify center median striping as needed to create an eastbound left turn lane (align with opposing westbound left turn lane)	With future development and associated opening of the access on the north leg of the Bent Grass Meadows Blvd./Meridian Park Drive intersection.	With future development.

Source: LSC Transportation Consultants, Inc. (Date: 5/1/2020)

Page: 19

Number: 1 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:39:46

Prop. continuous to Owl Pl.

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:39:18

Table 5 has been updated to show a continuous right-turn accel/decel lane between Bent Grass Meadows Drive and Owl Pl

Number: 2 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:39:26

A raised median is required if the access remains open /ROO.

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:45:14

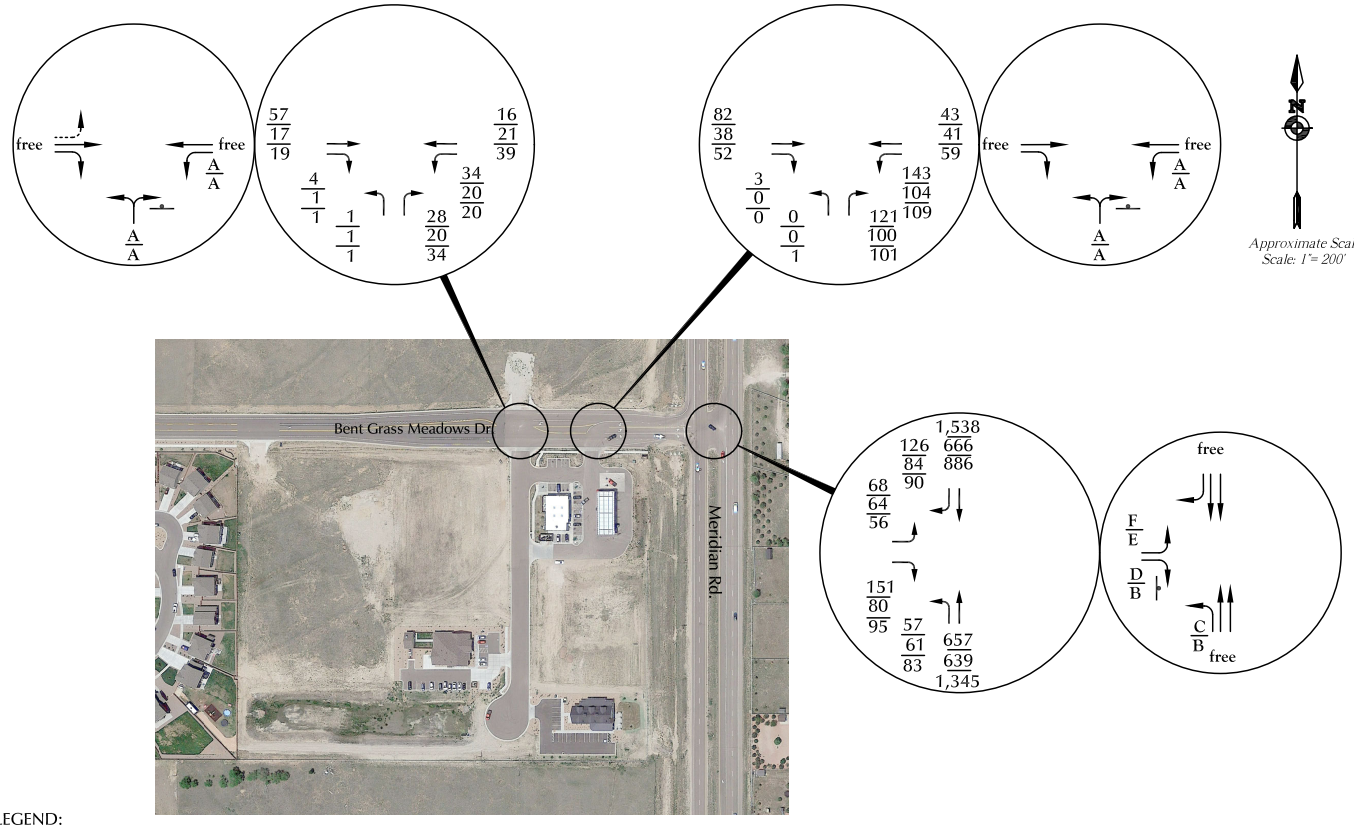
The 7-Eleven access is planned to be closed

Number: 3 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:41:21

A raised pork chop island and raised median is required if the access remains open as ROO.

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:45:28

The 7-Eleven access is planned to be closed



LEGEND:

= Stop Sign

XX / XX / XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / Noon Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

C / A / B = AM Individual Movement Peak-Hour Level of Service / Noon Individual Movement Peak-Hour Level of Service / PM Individual Movement Peak-Hour Level of Service

Based on counts by LSC Sept and Oct 2018

1 Show link ADTs

Figure 4

Existing Traffic, Lane Geometry, Traffic Control and Level of Service

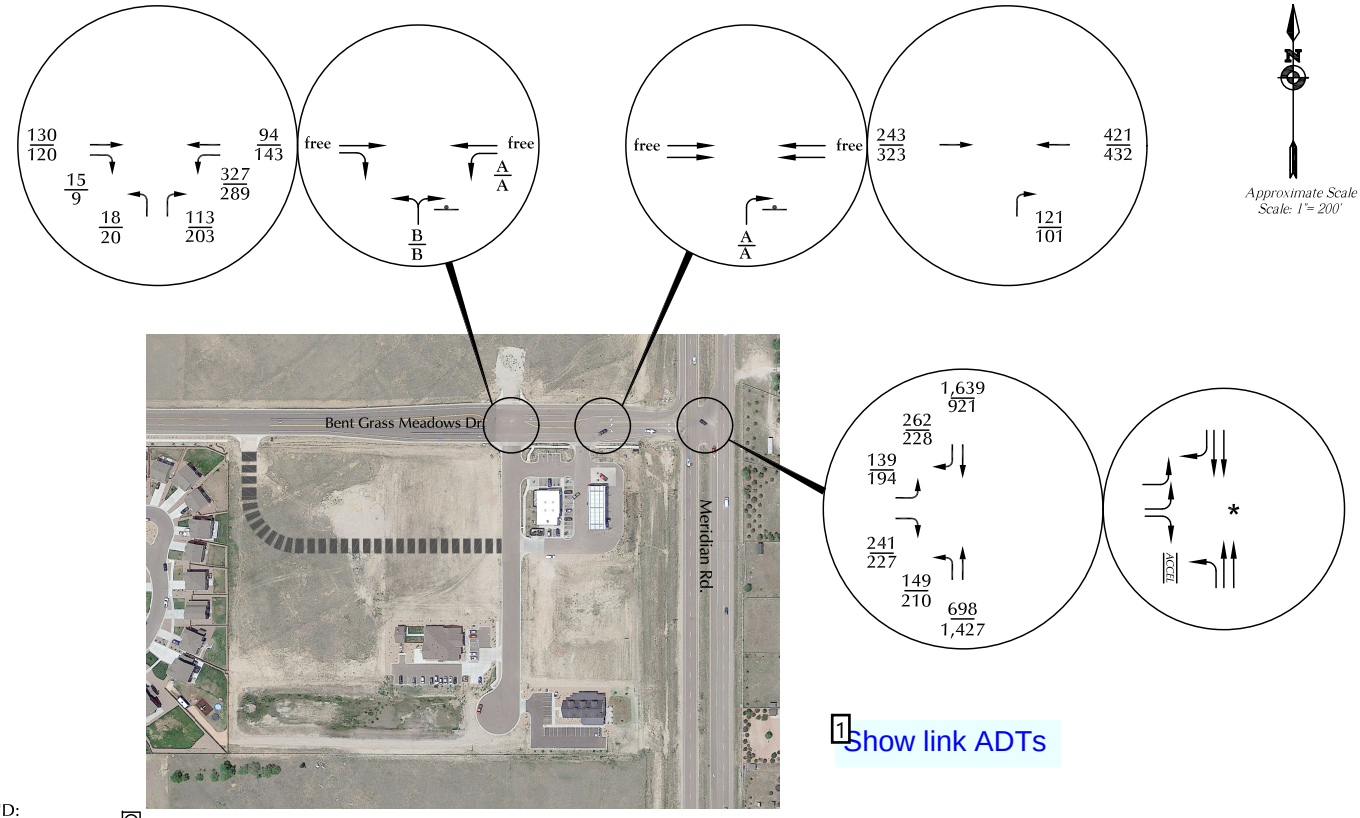
Bent Grass Meadows (LSC #194900)

LSC TRANSPORTATION CONSULTANTS, INC.

Page: 24

Number: 1 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:55:50

Show link ADTs



1 Show link ADTs

LEGEND:

= Stop Sign = Traffic Signal

XX/XX = AM Weekday Peak-Hour Traffic (vehicles per hour) / PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service / PM Individual Movement Peak-Hour Level of Service

C/C = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

*Note: See Table 3 for Level of Service Analysis of multiple traffic control options.

Figure 10

Year 2021 Total Traffic, Lane Geometry, Traffic Control and Level of Service

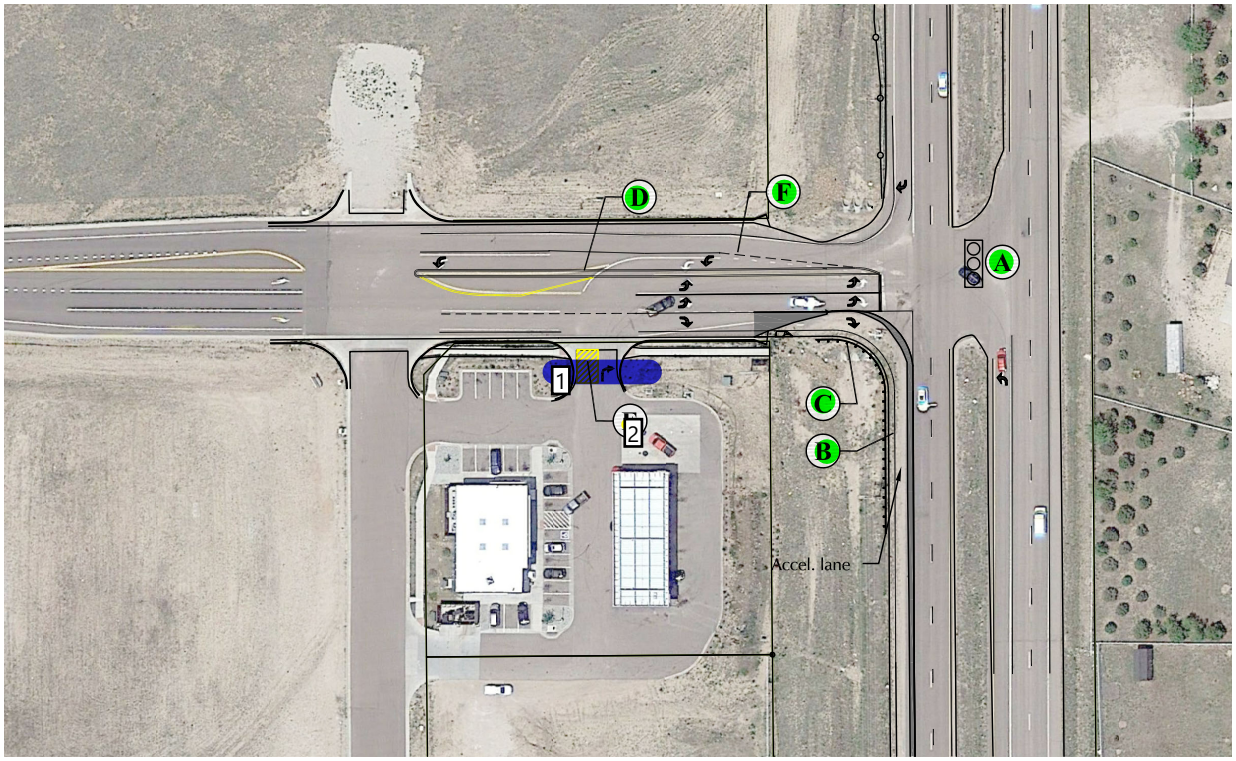
Bent Grass Meadows (LSC #194900)

LSC TRANSPORTATION CONSULTANTS, INC.

Page: 30

Number: 1 Author: dsdrice Subject: Text Box Date: 7/17/2020 12:56:06

Show link ADTs



Approximate Scale
Scale: 1"= 100'

Please refer to Table 5 for the list of improvements A-F.

Figure 11

Proposed Short Term Roadway Improvements

Bent Grass Meadows (LSC #194900)

LSC TRANSPORTATION CONSULTANTS, INC.

Page: 31

Number: 1 Author: dsdrice Date: 7/17/2020 10:50:52

Number: 2 Author: dsdrice Subject: Highlight Date: 7/17/2020 12:42:31

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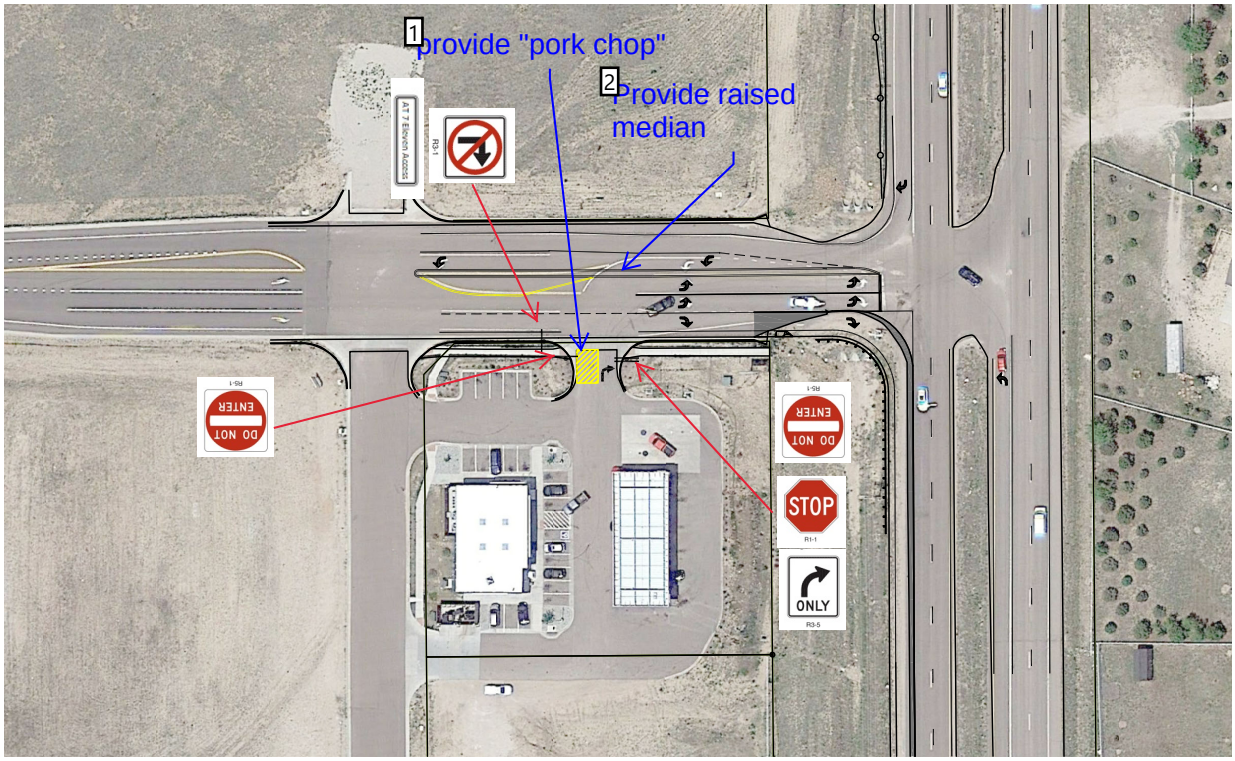

Approximate Scale
Scale: 1"= 100'

Figure 13

Proposed 7-Eleven Access Striping and Signing

Bent Grass Meadows (LSC #194900)

LSC TRANSPORTATION CONSULTANTS, INC.

Page: 33

Number: 1 Author: dsdrice Subject: Callout Date: 7/17/2020 10:57:13

provide "pork chop"

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:46:04

As the 7-Eleven access has been closed this figure has been removed from the updated memorandum

Number: 2 Author: dsdrice Subject: Callout Date: 7/17/2020 10:57:30

Provide raised median

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 19:46:10

As the 7-Eleven access has been closed this figure has been removed from the updated memorandum

Replace background/adjusted sheets?

1

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↱
Traffic Vol, veh/h	243	0	0	421	0	121
Future Vol, veh/h	243	0	0	421	0	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	264	0	0	458	0	132

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	132
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	-	0	893
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	893
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	893	-	-
HCM Lane V/C Ratio	0.147	-	-
HCM Control Delay (s)	9.7	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-

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Number: 1 Author: dsdrice Subject: Text Box Date: 7/17/2020 13:38:41

Replace background/adjusted sheets?

Author: Kirstin Subject: Sticky Note Date: 7/24/2020 09:46:50

Updated LOS have been included in the udpated memorandum

1427 missing?

Intersection	
Int Delay, s/veh	39.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	194	227	210	0	921	228
Future Vol, veh/h	194	227	210	0	921	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	223	261	226	0	990	245

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1442	495	1235	0	-	0
Stage 1	990	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Critical Hdwy	6.63	6.93	4.13	-	-	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	~ 134	521	562	-	-	-
Stage 1	321	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 80	521	562	-	-	-
Mov Cap-2 Maneuver	~ 150	-	-	-	-	-
Stage 1	~ 192	-	-	-	-	-
Stage 2	640	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	151	15.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	562	-	150	521	-	-
HCM Lane V/C Ratio	0.402	-	1.487	0.501	-	-
HCM Control Delay (s)	15.6	0$	305.9	18.6	-	-
HCM Lane LOS	C	A	F	C	-	-
HCM 95th %tile Q(veh)	1.9	-	14.8	2.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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Number: 1 Author: dsdrice Subject: Cloud+ Date: 7/17/2020 12:48:12

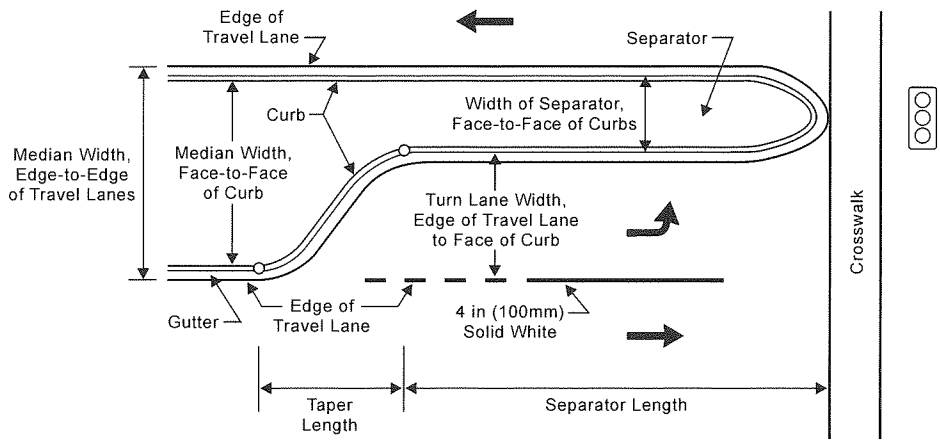
1427 missing?

Author: Kirstin Subject: Sticky Note Date: 7/23/2020 21:15:25

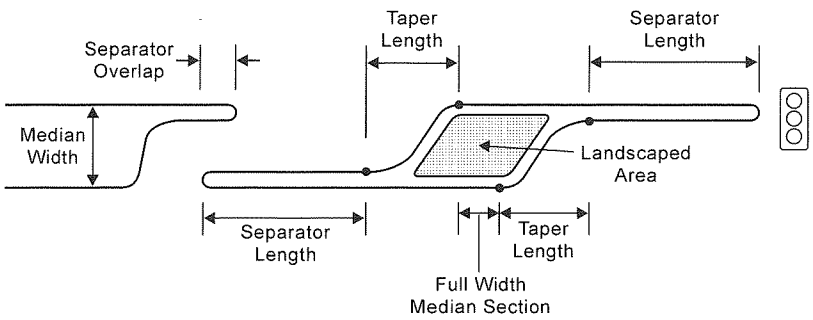
This analysis is for the scenario with a channelized "T" configuration. In this scenario a raised island is assumed to be constructed between the northbound through lanes and the northbound left-turn acceleration lane. The northbound through volume is therefore removed from the analysis.

ft-Turn Bay Length

ce it has been determined that a left-turn bay is warranted, or should be provided, the estion becomes: "How long should it be?" The physical length of the turn bay excludes distance traveled during perception-reaction time. The deceleration/maneuver tance ($d_2 + d_3$) is found in Table 5–13. The queue storage length can be found using procedures described in the following section. In some situations the length may be uenced by traffic in the through lanes. The left-turnbay, d_3 and d_4, should be longer n the queue in the adjacent through lane so that entry is not blocked—especially a -turn bay on a divided roadway. Figure 5–22 illustrates the elements of a median ening in a nontraversable median; Figure 5–23 illustrates the elements of an isolated -turn bay on an undivided roadway.



(a) Left-turn bay at an Intersection.



(b) Directional left-turn median opening.

Figure 5–22. ***Elements of a Left-Turn Bay at a Median Opening***

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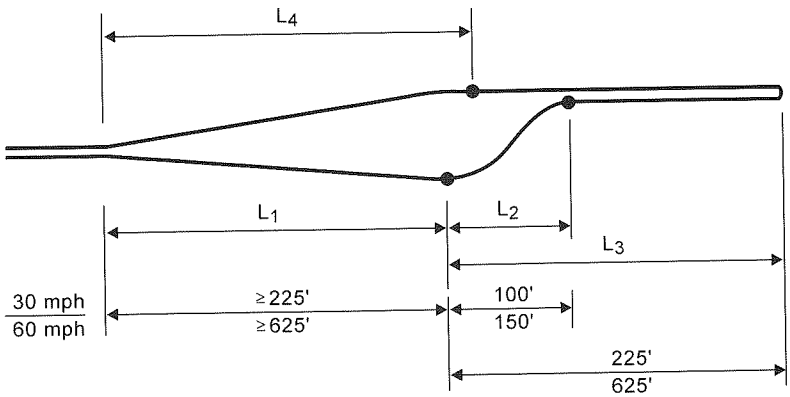
Number: 1 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:56:38



L_1 = Approach Taper
L_2 = Bay Taper
L_3 = Length of Left-Turn Bay
L_4 = Departure Taper

Figure 5–23. ***Elements of an Isolated Left-Turn Bay***

Queue Storage

The storage length should be sufficient to store all arriving left-turn vehicles a majority of the time. The higher the functional classification of the roadway, the higher the desired probability that the storage length will be as long, or longer, than the queue. Turn bays on major roadways should be able to store all arriving vehicles at least 95 percent of the time. For example, a signalized intersection having a 120-second cycle in the peak hour (30 cycles per hour) on an average, the storage should be adequate on 28.5 cycles out of 30. The queue will be longer than the design storage length for 1.5 cycles out of 30. A lower probability of storing all arriving vehicles may be acceptable on roadways of lower functional importance where capacity is not as critical and drivers expect some disruption in traffic flow.

Suggested Criteria for Queue Storage
(Probability of Storing Left-Turn Vehicles)

- Major Arterial: ≥ 95 percent
- Minor Arterial: 85 percent to 90 percent
- Collector: 80 percent to 85 percent

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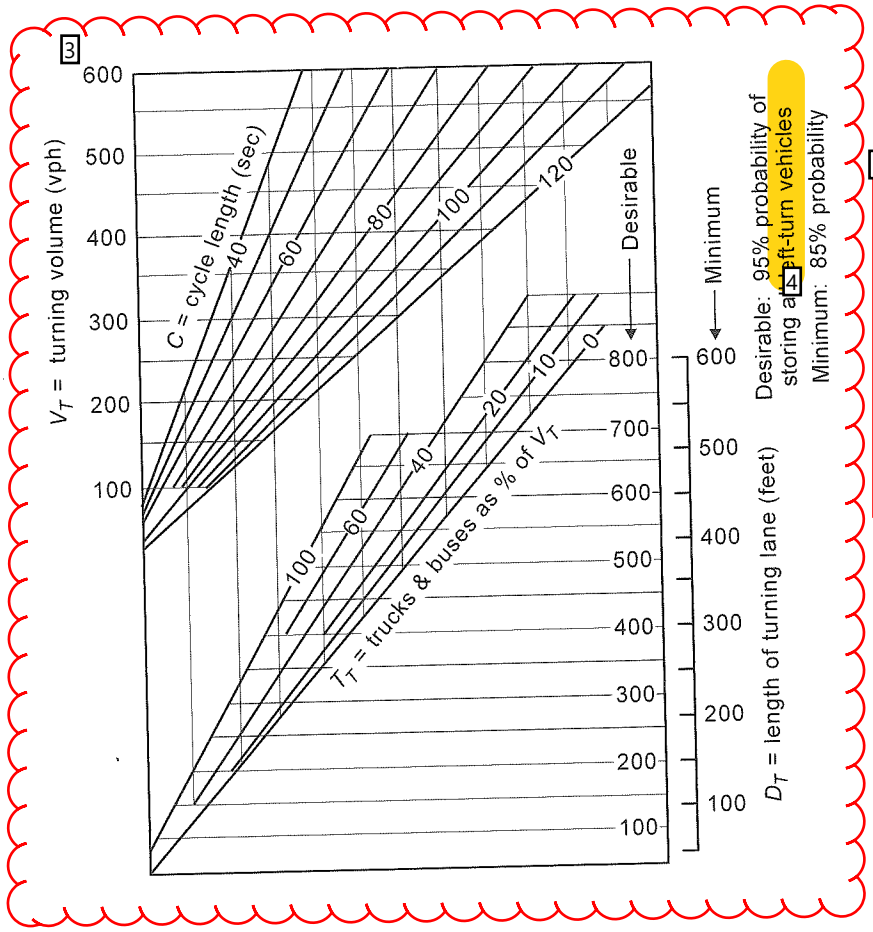
Number: 1 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:57:18

Number: 2 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:57:37

The required queue storage can be estimated by the following methods: 1) direct use of the equations from queuing theory, 2) the nomograph developed by Leisch [14], 3) rules-of-thumb, or 4) highway capacity analysis computer programs. Use of the nomograph and rules-of-thumb are illustrated below.

The nomograph shown in Figure 5–24 was developed from the solution of the queuing equations for numerous conditions at signalized intersections. It provides theoretically correct results considering the left-turn volume and cycle length.



Same as ECM Figure 2-27 except the notes on the right side were ommited from the ECM version.

Example:

Conditions:

240 vph left-turn
72 second cycle
10% trucks

Solution:

Desirable storage = 260 ft.
Minimum storage = 200 ft.

Figure 5–24. ***Nomograph for Single Lane Left-turn Queue Storage Length***

Source: Leisch [14].

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Number: 1 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:57:52

Number: 2 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:58:40

Number: 3 Author: jchodsdon Subject: Polygon Date: 7/23/2020 15:00:13

Number: 4 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:58:52

Number: 5 Author: jchodsdon Subject: Text Box Date: 7/23/2020 15:03:24

Same as ECM
Figure 2-27 except the notes on the right side were ommited from the ECM version.

Number: 6 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:58:58

Number: 7 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:59:06

Number: 8 Author: jchodsdon Subject: Pencil Date: 7/23/2020 14:59:04

COMMENT RESPONSES – FDR/MDDP

MDDP and
UPDATED TITLE

GALLOWAY RESPONSE

Galloway

FINAL DRAINAGE REPORT

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE

El Paso County, Colorado

PREPARED FOR:
Challenger Communities, LLC
8605 Explorer Dr., Suite 250
Colorado Springs, CO 80920

PREPARED BY:
Galloway & Company, Inc.
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920

DATE:
March 2020

ENGINEER'S STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the Drainage Criteria Manual for the City of Colorado Springs and El Paso County. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

COLORADO LICENSED
CHARLENE M DURHAM
36727
PROFESSIONAL ENGINEER

Charlene Durham, PE 36727
For and on behalf of Galloway & Company, Inc.

Date
04/06/20

DEVELOPER'S CERTIFICATION

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

SIGNATURE ADDED

By:_____ _____
Date

Address: Challenger Communities, LLC
8605 Explorer Dr., Suite 250
Colorado Springs, CO 80920

UPDATED TO "EL PASO COUNTY"

DEVELOPER'S CERTIFICATION

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

_____ _____
Jennifer Irvine, P.E. Date
County Engineer/ECM Adminstrator

Conditions:

TABLE OF CONTENTS

Comments are cursory; The MDDP needs to be merged with this report or vice versa. See previous MDDP redlines.

ADDRESSED PREVIOUS MDDP COMMENTS

I. Purpose

The intent of the developer is to make improvements to the intersection at Meridian Road and Bent Grass Meadows Drive in association with the residential development of the Bent Grass Subdivision. The purpose of this Final Drainage Report is to identify drainage patterns, locate and identify tributary or downstream drainage features and facilities that are impacted by the improvements, and to identify which types of drainage facilities will be needed and where they will be located

II. General Description

The site is located in the Northwest ¼ and Southwest ¼ of Section 1, Township 13S, Range 65W, of the Sixth Principal Meridian, County of El Paso, State of Colorado. The proposed improvements are located at the intersection of Bent Grass Meadows Drive and Meridian Road, as well as the west side of Meridian Road from Bent Grass Meadows Drive to Owl Place. The proposed improvements include the construction of a right turn lane from Bent Grass Meadows Drive onto Meridian Road as well as a southbound acceleration lane from Bent Grass Meadows Drive to Owl Place. A Vicinity Map is included in Appendix A.

The existing soil type within the proposed site as determined by the NRCS Web Soil Survey for El Paso County Area consists of Columbine gravelly sandy loam which is defined as having a hydrologic soil group of A. See the soils map included in Appendix A.

Needs to be in this report.

LEFT THIS REPORT IN AS THIS IS BEING UPDATED AS AN "AMENDMENT" TO THAT REPORT

III. Previous Reports

The proposed site has been included in multiple drainage s
composite list of the existing reports pertaining to this site a

1. *Falcon Drainage Basin Planning Study*, by Matrix Design Group, September 2015.
2. *Master Development Drainage Plan – Bent Grass Residential Subdivision*, by Galloway & Company, May 2019.
3. *Master Development Drainage Plan and Preliminary Drainage Plan – Bent Grass Subdivision*, by Kiowa Engineering Corporation, December 2006.
4. *Final Drainage Report for Bent Grass Residential (Filing No. 1)*, by Classic Consulting Engineers & Surveyors, LLC, August 2014.
5. *Final Drainage Report Addendum for Bent Grass Residential (Filing No. 1)*, by Classic Consulting Engineers & Surveyors, LLC, August 2015.

reference Filing 2 FDR

REFERENCE ADDED

IV. Drainage Criteria

Hydrology calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014.

The drainage calculations were based on the criteria manual Figure 6-5 and IDF equations to determine the intensity, and are listed in Table 1 below.

Table 1 - Precipitation Data

Return Period	One Hour Depth (in).	Intensity (in/hr)
5-year	1.50	5.17
100-year	2.52	8.68

The rational method was used to calculate peak flows as the tributary areas are less than 100 acres. The rational method has been proven to be accurate for basins of this size and is based on the following formula:

Q = CIA

Where:

Q = Peak Discharge (cfs)
C = Runoff Coefficient
I = Runoff intensity (inches/hour)
A = Drainage area (acres)

The runoff coefficients are calculated based on land use, percent imperviousness, and design storm for each basin, as shown in the drainage criteria manual (Table 6-6). Composite percent impervious and C values were calculated using the residential, streets, roofs, and lawns coefficients found in Table 6-6 of the manual.

The 100-year event was used as the major storm event and the 5-year event was used as the minor event.

For the analysis of the existing channel adjacent to Meridian Road and the preliminary design of the proposed channel, Bentley Flowmaster was utilized. Flowmaster was used to evaluate velocity, Froude number, and channel depth. A Manning's n value of 0.035 was utilized for the channel which is appropriate for the existing native grass that comprises the channel section. The proposed channel was designed to have a maximum depth of 5' per the criteria manual and have a maximum velocity of 5 ft/s with a maximum Froude number of 0.6.

V. Existing Drainage Conditions

In the existing conditions runoff from the west half of Meridian Road near Bent Grass Meadows Drive drains directly into the roadside channel, which flows south at an average slope of 1.75%. The majority of the channel in this area is triangular in shape with a depth of approximately 3 feet. As previously stated, the existing channel was analyzed using Bentley Flowmaster. The flow rate used for the analysis was taken from the Falcon DBPS. In the DBPS this section of the channel is referred to as RMT064 which has a flow rate of 580 cfs in the existing conditions. The Flowmaster calculations, which have been included in Appendix C, show that the existing channel can only convey approximately 260 cfs in its current state. When 580 cfs is analyzed in the existing channel it produces a depth of approximately 4 feet, exceeding the channel depth by 1 foot. Relevant excerpts from the DBPS are included in Appendix A.

There are also three existing 45" x 29" elliptical RCP's that run beneath Bent Grass Meadows Drive that were analyzed with this report. The Federal Highway Administration's HY-8 program was used to analyze the culvert and design the proposed culverts in the future conditions. The calculations included in

Appendix C show that the existing culverts can convey approximately 166 cfs before flow begins to overtop Bent Grass Meadows Drive. All of the included calculations show that the culverts and channel are clearly vastly undersized and will need to be improved by El Paso County in the future to properly convey the flows outlined in the DBPS.

A historic basin map has been prepared for this area to analyze the existing basin contributing to the channel. The historic map is included in Appendix D and the basin is described below.

Basin H-1 (2.03 AC, Q_5 = 3.2 cfs, Q_{100} = 7.3 cfs): is associated with the western half of Meridian Road and the eastern half of the channel, south of Bent Grass Meadows Drive, in the existing conditions. Runoff from the basin generally flows to the southwest, into the roadside channel, where it is conveyed south.

Design Point 20 (225.0 AC, Q_5 = 91.8 cfs, Q_{100} = 226.0 cfs): is located north of basin OS-5, and is comprised of Basins B3 thru B6, A1, and A3 in Bent Grass Filing No. 3. Flows will cross under Woodmen Hills Drive via an existing culvert, then sheet flow to the southeast, passing through Basin OS-5 to DP 11.

Basin OS-5 (14.13 AC, Q_5 = 4.9 cfs, Q_{100} = 27.5 cfs): a basin that is associated with Bent Grass Filing No. 1. Runoff from this basin sheet flows from the North to the South into basin OS-6 and an existing sediment pond.

Basin OS-6 (5.81 AC, Q_5 = 1.9 cfs, Q_{100} = 12.8 cfs): a basin that is associated with Bent Grass Filing No. 1. Runoff from this basin sheet flows from the North to South to an existing sediment pond and then into Bent Grass Meadows Drive. Based on the sediment pond design from the Bent Grass Filing No. 1 FDR, stormwater is released at a rate of 108 cfs. Flows will continue to the east, through existing curb & gutter on the north side of Bent Grass Meadows Drive, to the Meridian Road intersection. At this location, flows will enter the north side of the existing roadside ditch along Meridian Road.

VI. Four Step Process

The Four Step Process is used to minimize the adverse impacts of urbanization and is a vital component of developing a balanced, sustainable project. Below identifies the approach to the four-step process:

1. Employ Runoff Reduction Practices

The proposed roadway improvements use Low Impact Development (LID) practices to reduce runoff at the source. All runoff is routed through the pervious areas in the channel to promote infiltration.

2. Implement BMPs That Provide a Water Quality Capture Volume with Slow Release

This step utilizes formalized water quality capture volume to slow the release of runoff from the site. There is no water quality being proposed with the associated roadway improvements. Per Section 1.7.1.B of the El Paso County *Stormwater Quality Policy & Procedures,* since the site is less than 1 acre, is not a sensitive or high-risk site, and does not [illegible] discharge into State Waters, it is excluded from any water quality requirements.

ADDED

ADDED

ultimately

and upstream basin

Currently, the existing roadside ditch conveys runoff to the existing detention and water quality pond MN, as shown and discussed in the Falcon DBPS. The Falcon DBPS also shows a future detention and water quality pond SR-4 that is to receive flows from basin MT060 and d[illegible] MT070 ultimately routing to existing Pond MN. However, flows from Bent Gra[illegible] listed in basin MT060 but are being routed to the existing roadside ditch along [illegible] is in Basin MT070. Therefore, the flows from the "School Site" bypass future [illegible] directly to Pond MN. The proposed improvements impact on the existing drai[illegible] Pond MN and Pond SR-4 are discussed later in the report.

WORDING UPDATED - NEW BASINS MT 060A NOW SHOWN GOING TO SR4 WHILE MT070 SHOWN GOING TO PREVIOUS LOCATION (REFER TO HMS MODEL)

Not correct - flows will enter the east side of Pond SR4 west of the new road "Falcon Market Place"; also, Pond SR4 is currently under construction.

Ber

REINFORCEMENT MAT HAS BEEN ADDED TO SIDE SLOPES OF EXISTING CHANNEL. DESIGN AND SPEC INCLUDED IN APPENDIX

The Bent Grass development has routed more flow to the road; what improvements are necessary to stabilize the roadside channel?

3. Stabilize Drainageways

This step implements stabilization to the channel to accommodate developed flows while protecting infrastructure and controlling sediment loading from erosion in the drainageways. Erosion protection in the form of riprap pads at all outfall points to the channel to prevent scouring of the channel from point discharges.

A stability analysis on the existing roadside ditch along Meridian road was conducted with results shown in Appendix C. From the analysis, it was determined that the existing ditch is not in stable condition with existing DBPS flows. Improvements are anticipated to be made in the future, per recommendations from the Falcon DBPS, when additional land is obtained to expand the ROW along the southbound portion of Meridian Road.

4. Implement Site Specific and Other Source Control BMPs

Since this project only includes roadway work with no curb and gutter, the potential use of source control BMP's is limited. All runoff however, will be conveyed through native grass buffers and a native grass channel to promote infiltration and pollutant removal.

VII. Proposed Drainage Conditions

In the proposed conditions the historic drainage pattern will be maintained with runoff draining from Meridian Road and Bent Grass Meadows Drive directly into the roadside channel. In order to adequately determine the increase in runoff from the proposed improvements, the proposed basin, P-1, encompasses the same area as the historic basin, H-1. Basin H-1 is 48.4% impervious with peak runoff of 3.2 cfs and 7.3 cfs in the 5-year and 100-year storm events, respectively. Basin P-1 is 64.2% impervious with peak runoff of 4.2 cfs and 8.7 cfs in the 5-year and 100-year storm events, respectively. The 1.0 cfs increase in the 5-year event and the 1.4 cfs increase in the 100-year event produced by the proposed improvements will have minimal impact on any downstream properties or infrastructure. Basin P-1 is described further below.

Basin P-1 (2.03 AC, Q_5 = 4.2 cfs, Q_{100} = 8.7 cfs): is associated with the western half of Meridian Road and the eastern half of the channel, south of Bent Grass Meadows Drive, in the proposed conditions. Runoff from the basin generally flows to the southwest, into the roadside channel, where it is conveyed south.

Design Point 30 (225.0 AC, Q_5 = 91.8 cfs, Q_{100} = 226.0 cfs): is located north of basin OS-5, and is comprised of Basins B3 thru B6, A1, and A3 in Bent Grass Filing No. 3. Flows will cross under Woodmen Hills Drive via an existing culvert, then sheet flow to the southeast, passing through Basin OS-5 to DP 31.

Basin OS-5 (14.13 AC, Q_5 = 4.9 cfs, Q_{100} = 27.5 cfs): a basin that is associated with Bent Grass Filing No. 1. Runoff from this basin sheet flows from the North to the South into basin OS-6 and an existing sediment pond at DP-32.

Basin OS-6 (5.81 AC, Q_5 = 8.8 cfs, Q_{100} = 19.3 cfs): a basin that is associated with Bent Grass Filing No. 1. Runoff from this basin sheet flows from the North to South to an existing sediment pond and then into Bent Grass Meadows Drive. Based on the sediment pond design from the Bent Grass Filing No. 1 FDR, stormwater is released at a rate of 108 cfs. Flows will continue to the east, through existing curb & gutter on the north side of Bent Grass Meadows Drive, to the Meridian Road intersection. At this location, flows will enter the north side of the existing roadside ditch along Meridian Road. In addition to roadway

improvements along Meridian Road, Two additional 45” x 29” Elliptical pipes are proposed to be constructed under Bent Grass Meadows Drive to convey the off-site flow of 108 cfs.

A proposed basin map has been prepared for this area. The proposed map is included in Appendix D.

VIII. Proposed Channel Improvements

Although the existing channel and culverts are undersized and improvements will need to be made in the future, minimal channel improvements are being proposed at this time. With the construction of the right turn lane on Bent Grass Meadows Drive, the three RCP culverts will be extended approximately 15’ to span the extended width of the roadway. Additionally, two more 45”x29” Elliptical RCP pipes will be installed under Bent Grass Meadows Drive to convey the flows for Basins OS-5, OS-6, and DP 20.

In the future, El Paso County will need to improve the existing culverts and channel to adequately convey the flow outlined in the DBPS. These necessary improvements and associated calculations are described further below. A preliminary grading exhibit has been prepared showing these improvements and included in Appendix C.

Address the interim condition with the added flows.
Is interim protection proposed?

PARAGRAPH ADDED WITH DESCRIPTION OF REINFORMENT MAT BEING ADDED

Similar to the existing channel, Bentley Flowmaster was also used to desig
section. The future channel was designed to have a maximum depth of 5’ p
have a maximum velocity of 5 ft/s with a maximum Froude number of 0.6.
design, 1010 cfs, was taken from the future conditions in the Falcon DBPS
coming from the “School Site.”

The proposed channel section was designed as trapezoidal shape with a 15’ bottom width, 4:1 side slopes, and 0.3% longitudinal slope. The total depth of the channel will be 6’, providing 1’ of freeboard for the 5’ of water depth. The velocity of the proposed channel is 4.95 ft/s.

The Federal Highway Administration’s HY-8 program was also utilized to design the future culverts that will run beneath Bent Grass Meadows Drive. The calculations included in Appendix C show that in order to adequately convey the 1010 cfs in the future conditions, two 16’x4’ concrete box culverts will need to replace the existing elliptical RCP’s. In order to construct the box culverts, the channel will need to be flattened from downstream to create roughly 5’ of additional clearance below the road.

IX. Proposed Water Quality

There is no water quality being proposed with the associated roadway improvements. Per Section 1.7.1.B of the El Paso County *Stormwater Quality Policy & Procedures,* since the site is less than 1 acre, is not a sensitive or high-risk site, and does not directly discharge into State Waters, it is excluded from any water quality requirements.

Though the site does not include the addition of any proposed water quality or detention ponds, future Pond SR-4 and existing Pond MN from the Falcon DBPS will receive flows from the improved site. A HEC-HMS model of Basin MT070, described in the Falcon DBPS, was analyzed to include the improvements made to the site within Basin MT070 and the effects it has on existing Pond MN and future Pond SR-4. A copy of the report from HEC-HMS has been included in appendix B. As discussed previously, the “School Site” flows within Basin MT060 are conveyed to the existing roadside ditch on the west side of Meridian Road. This existing roadside ditch is within basin MT070, per the Falcon DBPS, and bypasses future Pond SR-4. From the analysis, Pond SR-4’s 100-yr. receiving flows decreased from

enters

UPDATED

1,000 cfs to 951.8 cfs. Based on the increase in impervious area, Basin MT070's Curve Number increased from 67 to 68. Subsequently, the 100-yr. receiving flows entering existing Pond MN remained the same at approximately 850 cfs.

X. Maintenance

The proposed channel will be a public facility. After completion of construction and upon the Board of County Commissioners acceptance the channel will be owned and maintained by El Paso County along with all drainage facilities within the public Right-of-Way.

XI. Wetlands Mitigation

No wetlands are located on site.

XII. Floodplain Statement

within? UPDATED

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map number 08041C0553G, effective December 7, 2018, the project site is located within Zone X. Zone X is areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance-flood. A copy of the FIRM Panel is included in Appendix A.

XIII. Drainage/Bridge Fees and Credits/Reimbursements

Since there is no land being platted with this development, drainage and bridge fees are not required.

XIV. Conclusion

This report for the proposed roadway improvements to Meridian Road, between Bent Grass Meadows Drive and Owl Place, has been prepared using the criteria and methods as described in the El Paso County Drainage Criteria Manual. Although the roadway improvements will result in slightly higher runoff to the roadside channel, there will be minimal impact on the downstream infrastructure. The channel was analyzed in the existing conditions and determined to be undersized. Although the channel improvements will not be made with this development, recommendations are made within this report for the future conditions of the channel. The channel will ultimately be publicly owned and maintained and shall be the responsibility of El Paso County.

XV. References

1. *City of Colorado Springs/County of El Paso Drainage Criteria Manual*, October 1991.
2. *Drainage Criteria Manual, Volume 2*, City of Colorado Springs, November 2002.
3. *Urban Storm Drainage Criteria Manual*, Urban Drainage and Flood Control District, January 2016 (with current revisions).
4. *Falcon Drainage Basin Planning Study*, by Matrix Design Group, September 2015.
5. *Master Development Drainage Plan and Preliminary Drainage Plan – Bent Grass Subdivision*, by Kiowa Engineering Corporation, December 2006.
6. *Final Drainage Report for Bent Grass Residential (Filing No. 1)*, by Classic Consulting Engineers & Surveyors, LLC, August 2014.
7. *Final Drainage Report Addendum for Bent Grass Residential (Filing No. 1)*, by Classic Consulting Engineers & Surveyors, LLC, August 2015.

APPENDIX A

Exhibits and Figures

MERIDIAN ROAD IMPROVEMENTS

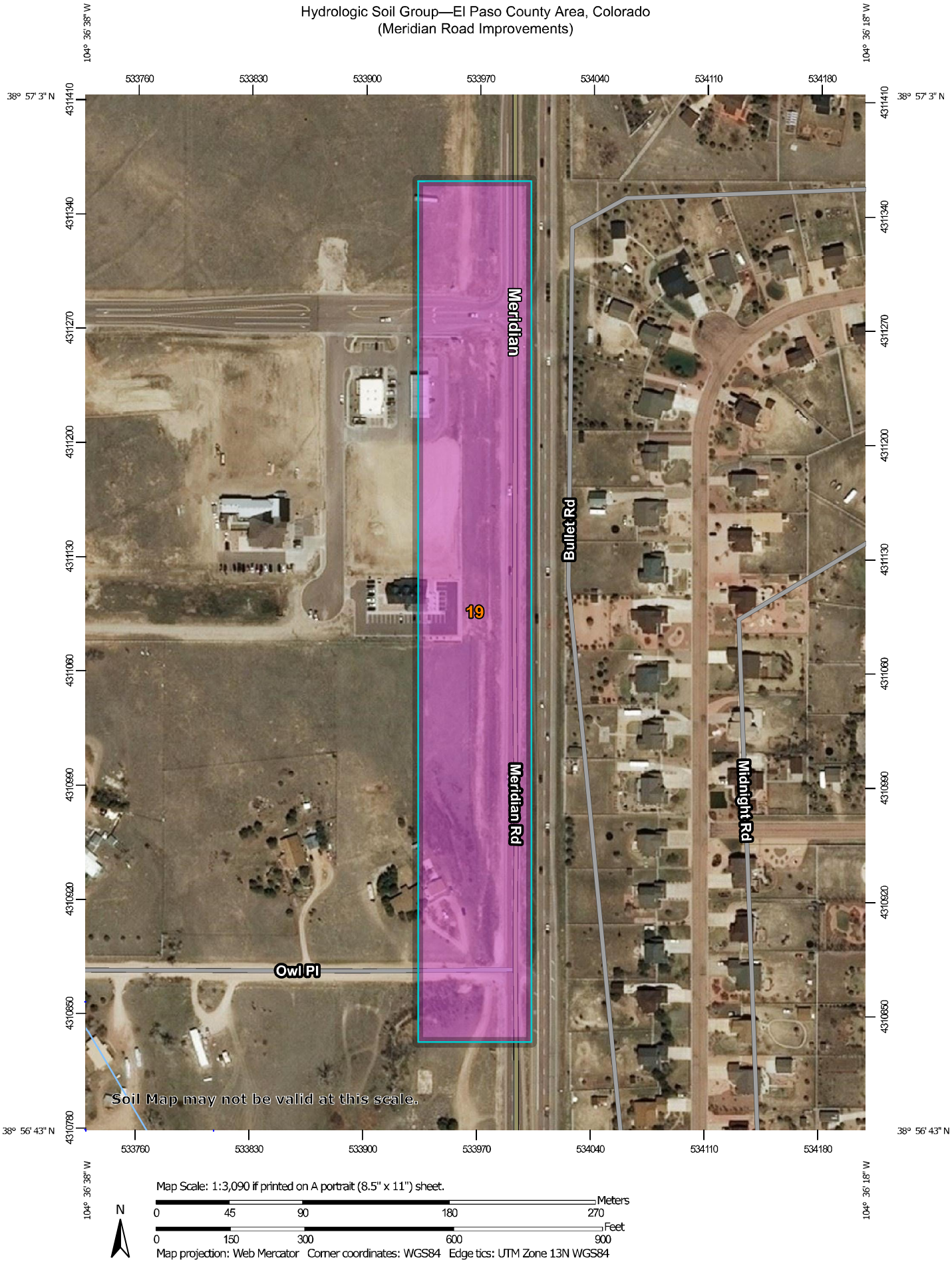
MERIDIAN RD & BENT GRASS MEADOWS DR
SCALE: 1" = 1,000'

VICINITY MAP

Project No:	CLH000015.20
Drawn By:	BHB
Checked By:	SMB
Date:	NOVEMBER 2019

Galloway
1755 Telstar Drive, Suite 107
Colorado Springs, CO 80920
719.900.7220 • GallowayUS.com

Hydrologic Soil Group—El Paso County Area, Colorado
(Meridian Road Improvements)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 8, 2018—May 26, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	A	9.1	100.0%
Totals for Area of Interest			**9.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

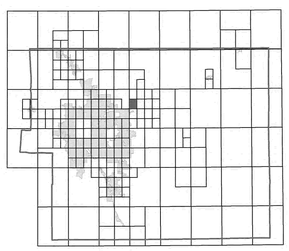
Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

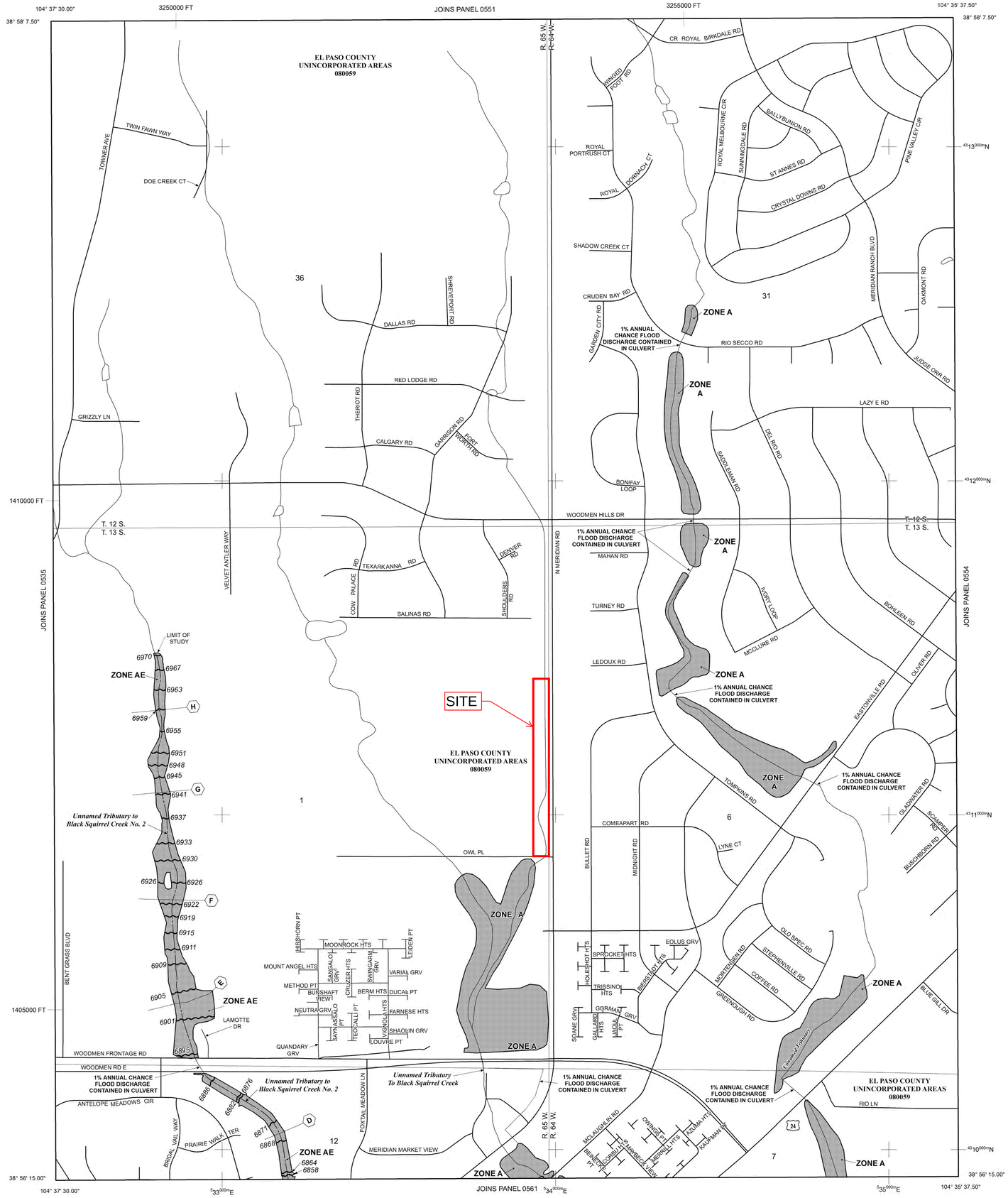
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - - 23	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0553G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 553 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0553	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0553G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

FALCON DRAINAGE BASIN PLANNING STUDY

SELECTED PLAN REPORT

FINAL - SEPTEMBER 2015

Prepared for:

El Paso County Public Services Department
3275 Akers Drive
Colorado Springs, CO 80922

Prepared By:

Matrix Design Group
2435 Research Parkway, Suite 300
Colorado Springs, CO 80920

Matrix Project No. 10.122.003

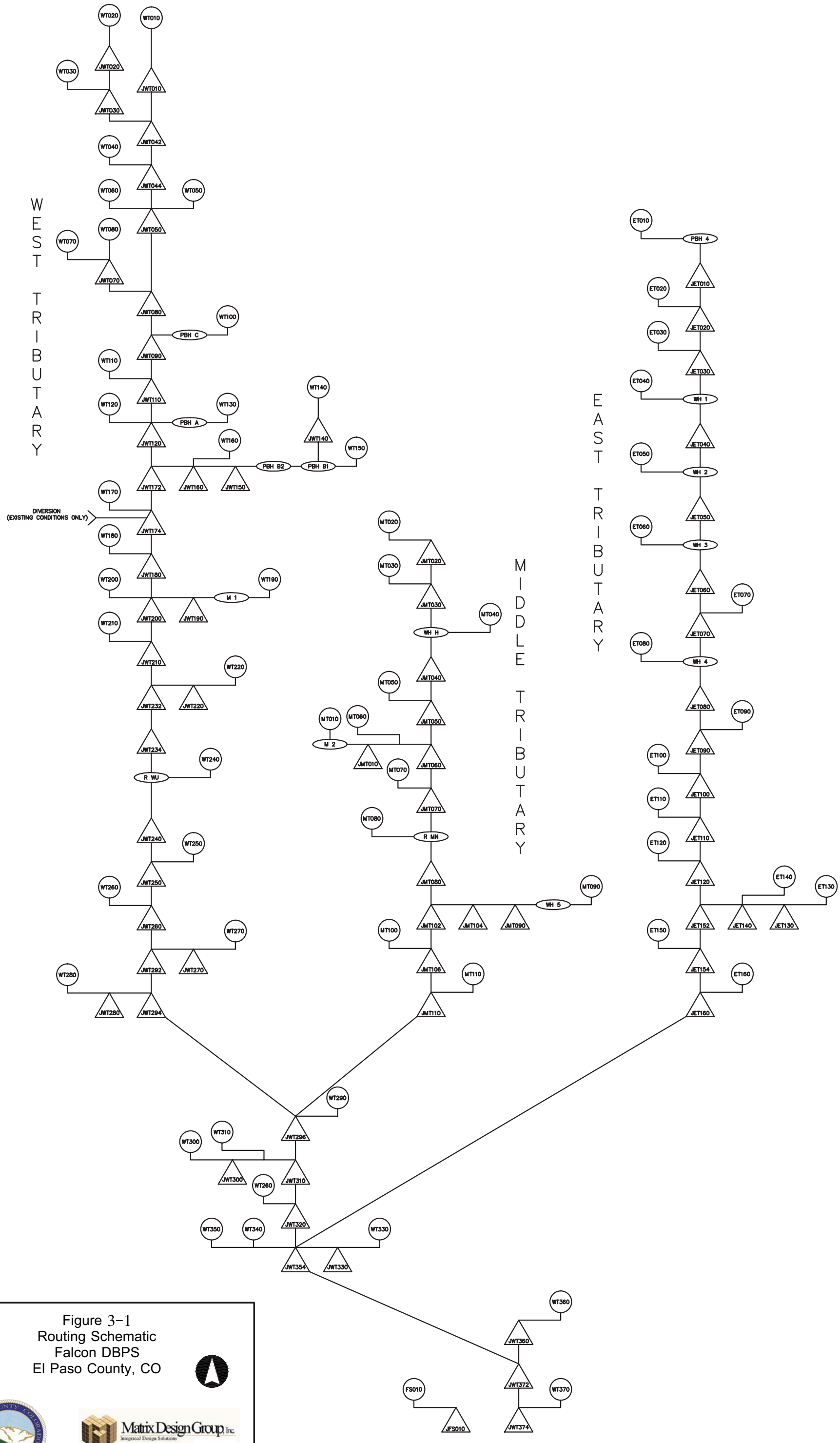
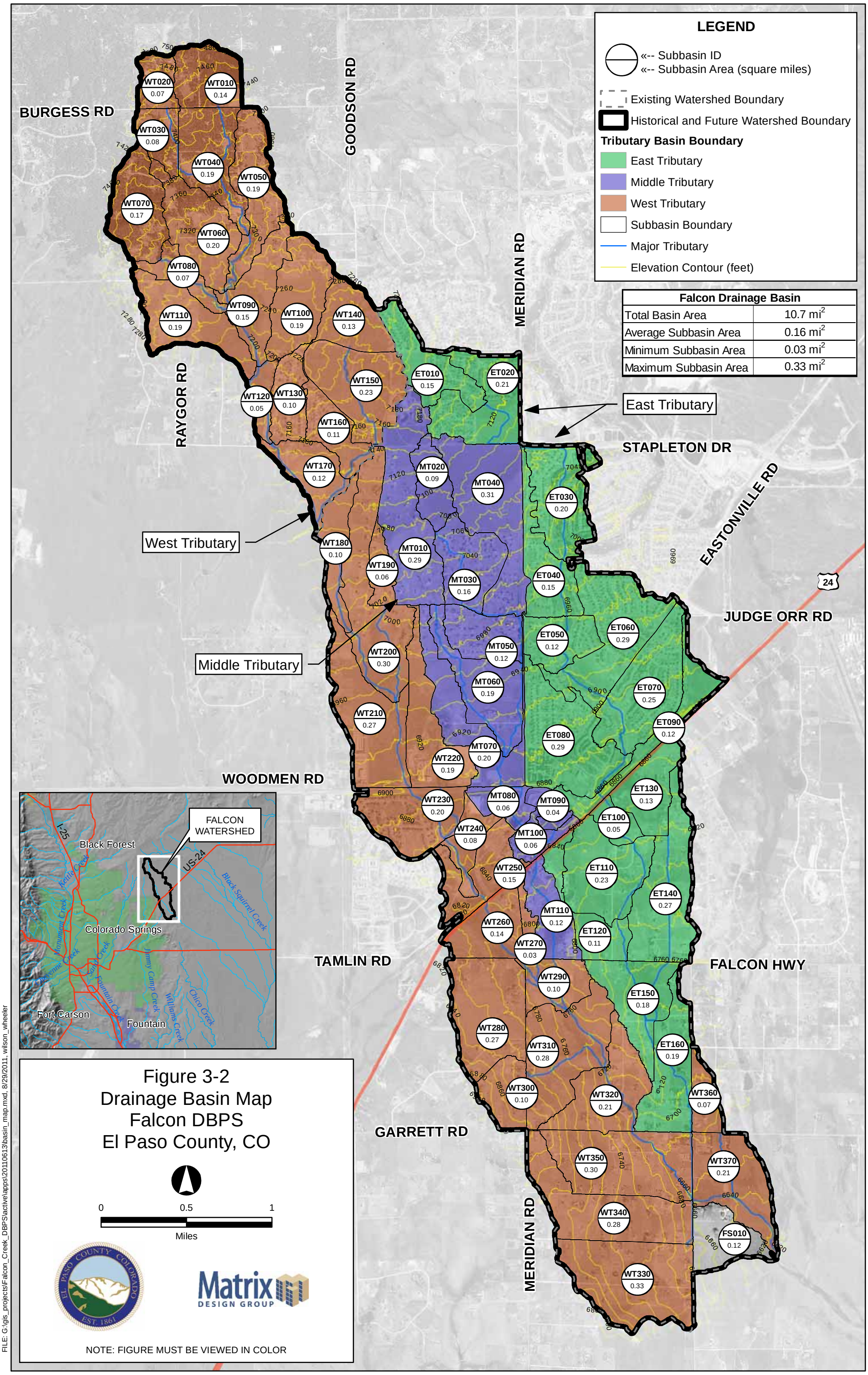
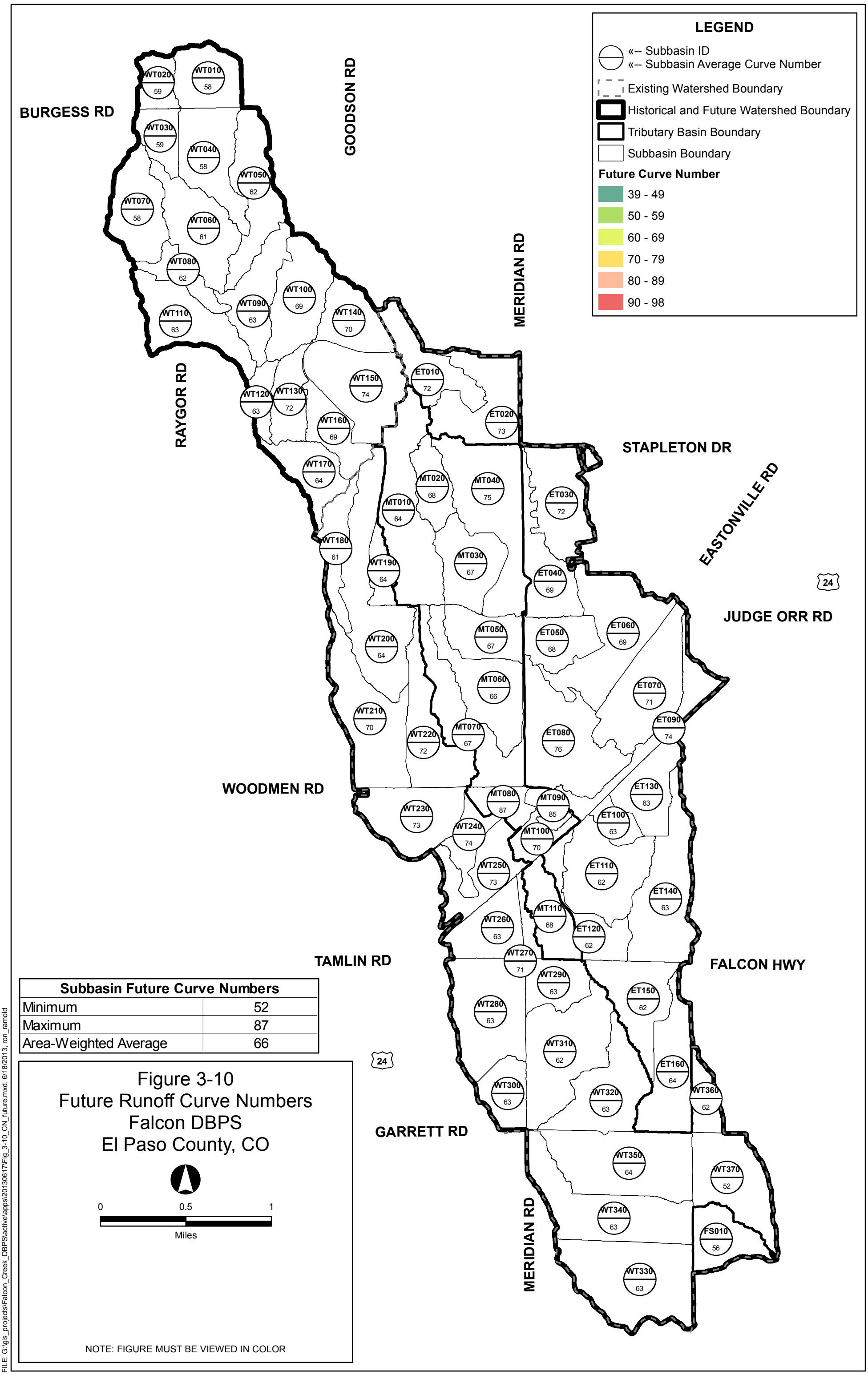


Figure 3-1
Routing Schematic
Falcon DBPS
El Paso County, CO

Matrix Design Group Inc.
Integrated Design Solutions

DRAWING NOT TO SCALE


LEGEND
«-- Subbasin ID
«-- Subbasin Area (square miles)
Existing Watershed Boundary
Historical and Future Watershed Boundary
Tributary Basin Boundary
East Tributary
Middle Tributary
West Tributary
Subbasin Boundary
Major Tributary
Elevation Contour (feet)
Falcon Drainage Basin
Total Basin Area 10.7 mi²
Average Subbasin Area 0.16 mi²
Minimum Subbasin Area 0.03 mi²
Maximum Subbasin Area 0.33 mi²
BURGESS RD
GOODSON RD
MERIDIAN RD
RAYGOR RD
STAPLETON DR
EASTONVILLE RD
JUDGE ORR RD
WOODMEN RD
TAMLIN RD
FALCON HWY
GARRETT RD
East Tributary
West Tributary
Middle Tributary
FALCON WATERSHED
Black Forest
Colorado Springs
Fort Carson
Fountain
I-25
US-24
Kettle Creek
Monument Creek
Black Squirrel Creek
Jimmy Camp Creek
Williams Creek
Chico Creek
Sand Creek
Fountain Creek
Figure 3-2
Drainage Basin Map
Falcon DBPS
El Paso County, CO
0
0.5
1
Miles
Matrix DESIGN GROUP
NOTE: FIGURE MUST BE VIEWED IN COLOR
FILE: G:\gis_projects\Falcon_Creek_DBPS\active\apps\20110613\basin_map.mxd, 8/29/2011, wilson_wheeler

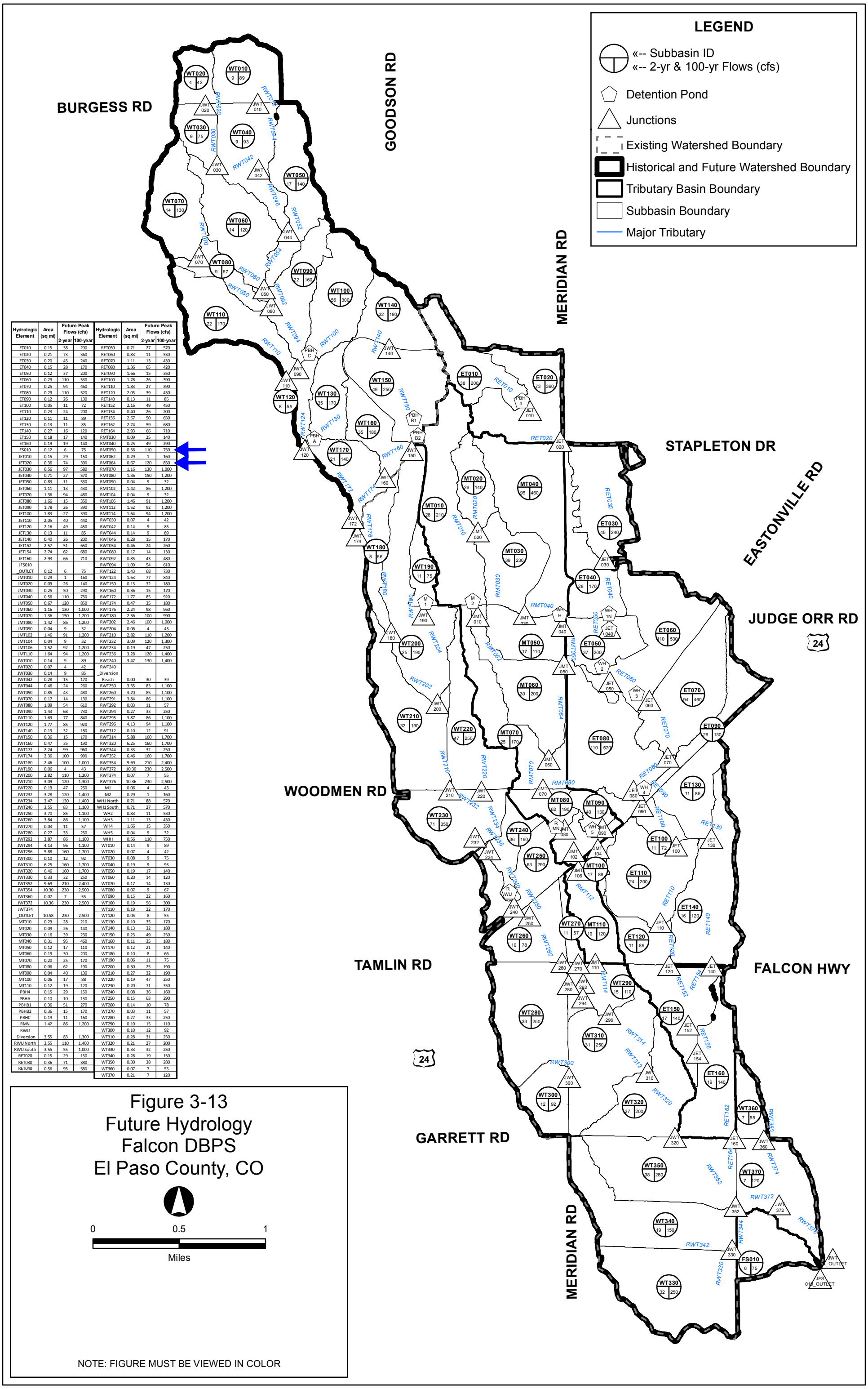


Subbasin Future Curve Numbers	
Minimum	52
Maximum	87
Area-Weighted Average	66

Figure 3-10
Future Runoff Curve Numbers
Falcon DBPS
El Paso County, CO

NOTE: FIGURE MUST BE VIEWED IN COLOR

FILE: G:\gis_projects\Falcon_Creek_DBPS\active\apps\20130617\Fig_3-10_CN_future.mxd, 6/18/2013, ron_ramold

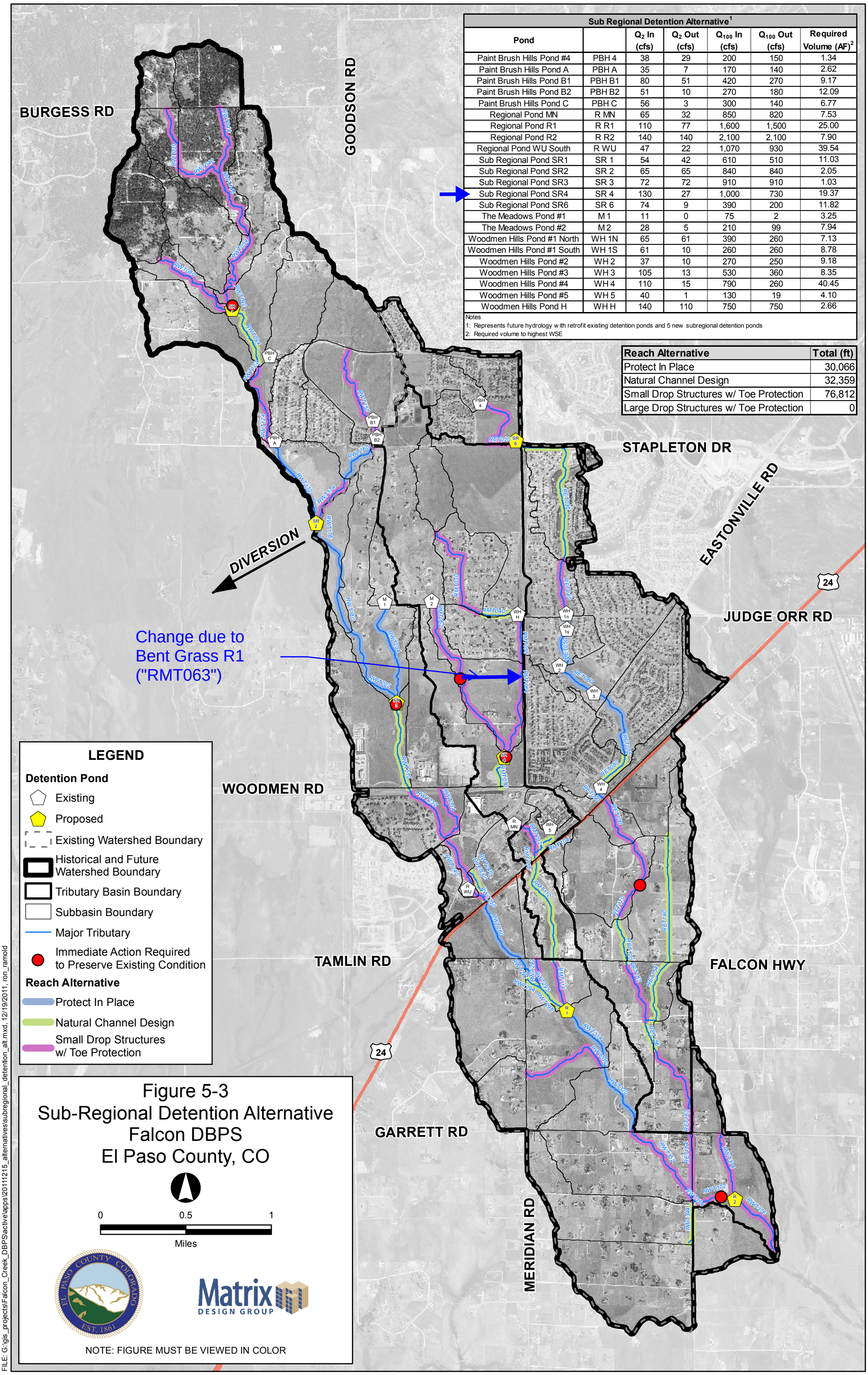


Hydrologic Element	Area (sq mi)	Future Peak Flows (cfs)		Hydrologic Element	Area (sq mi)	Future Peak Flows (cfs)	
		2-year	100-year			2-year	100-year
ET010	0.15	38	200	RET050	0.71	27	570
ET020	0.21	73	360	RET060	0.83	11	530
ET030	0.20	45	240	RET070	1.11	13	430
ET040	0.15	28	170	RET080	1.36	65	420
ET050	0.12	37	200	RET090	1.66	15	350
ET060	0.29	110	530	RET100	1.78	26	390
ET070	0.25	94	460	RET110	1.83	27	390
ET080	0.29	110	520	RET120	2.05	39	430
ET090	0.12	26	130	RET140	0.13	11	85
ET100	0.05	11	72	RET152	2.16	49	450
ET110	0.23	24	200	RET154	0.40	26	200
ET120	0.11	11	89	RET156	2.57	50	650
ET130	0.13	11	85	RET162	2.74	59	680
ET140	0.27	16	120	RET164	2.93	66	710
ET150	0.18	17	140	RMT030	0.09	25	140
ET160	0.19	19	140	RMT040	0.25	49	290
FS010	0.12	6	75	RMT050	0.56	110	750
JET010	0.15	29	150	RMT062	0.29	1	160
JET020	0.36	74	390	RMT064	0.67	120	850
JET030	0.56	97	580	RMT070	1.16	130	1,000
JET040	0.71	27	570	RMT080	1.36	150	1,200
JET050	0.83	11	530	RMT090	0.04	9	32
JET060	1.11	13	430	RMT102	1.42	86	1,200
JET070	1.36	94	480	RMT104	0.04	9	32
JET080	1.66	15	350	RMT106	1.46	91	1,200
JET090	1.78	26	390	RMT112	1.52	92	1,200
JET100	1.83	27	390	RMT114	1.64	94	1,200
JET110	2.05	40	440	RWT030	0.07	4	42
JET120	2.16	49	450	RWT042	0.14	9	85
JET130	0.13	11	85	RWT044	0.14	9	89
JET140	0.40	26	200	RWT046	0.28	15	170
JET152	2.57	51	650	RWT054	0.46	24	260
JET154	2.74	62	680	RWT080	0.17	14	130
JET160	2.93	66	710	RWT092	0.85	43	480
JFS010 _OUTLET	0.12	6	75	RWT094	1.09	54	610
JMT010	0.29	1	160	RWT122	1.43	68	730
JMT020	0.09	26	140	RWT124	1.63	77	840
JMT030	0.25	50	290	RWT150	0.13	32	180
JMT040	0.56	110	750	RWT160	0.36	15	170
JMT050	0.67	120	850	RWT172	1.77	85	920
JMT060	1.16	130	1,000	RWT174	0.47	35	180
JMT070	1.36	150	1,200	RWT176	2.24	98	960
JMT080	1.42	86	1,200	RWT180	2.36	100	990
JMT090	0.04	9	32	RWT202	2.46	100	1,000
JMT102	1.46	91	1,200	RWT204	0.06	4	43
JMT104	0.04	9	32	RWT210	2.82	110	1,200
JMT106	1.52	92	1,200	RWT232	3.09	120	1,300
JMT110	1.64	94	1,200	RWT234	0.19	47	250
JWT010	0.14	9	89	RWT236	3.28	120	1,400
JWT020	0.07	4	42	RWT240	3.47	130	1,400
JWT030	0.14	9	85	RWT240 _Diversion			
JWT042	0.28	15	170	Reach	0.00	30	39
JWT044	0.46	24	260	RWT250	3.55	83	1,100
JWT050	0.85	43	480	RWT260	3.70	85	1,100
JWT070	0.17	14	130	RWT291	3.84	86	1,100
JWT080	1.09	54	610	RWT292	0.03	11	57
JWT090	1.43	68	730	RWT294	0.27	33	250
JWT110	1.63	77	840	RWT295	3.87	86	1,100
JWT120	1.77	85	920	RWT296	4.13	94	1,100
JWT140	0.13	32	180	RWT312	0.10	12	91
JWT150	0.36	15	170	RWT314	5.88	160	1,700
JWT160	0.47	35	190	RWT320	6.25	160	1,700
JWT172	2.24	99	960	RWT344	0.33	32	250
JWT174	2.36	100	990	RWT352	6.46	160	1,700
JWT180	2.46	100	1,000	RWT354	9.69	210	2,400
JWT190	0.06	4	43	RWT372	10.30	230	2,500
JWT200	2.82	110	1,200	RWT374	0.07	7	55
JWT210	3.09	120	1,300	RWT376	10.36	230	2,500
JWT220	0.19	47	250	M1	0.06	4	43
JWT232	3.28	120	1,400	M2	0.29	1	160
JWT234	3.47	130	1,400	WH1 North	0.71	88	570
JWT240	3.55	83	1,100	WH1 South	0.71	27	570
JWT250	3.70	85	1,100	WH2	0.83	11	530
JWT260	3.84	86	1,100	WH3	1.11	13	430
JWT270	0.03	11	57	WH4	1.66	15	350
JWT280	0.27	33	250	WH5	0.04	9	32
JWT292	3.87	86	1,100	WHH	0.56	110	750
JWT294	4.13	96	1,100	WT010	0.14	9	89
JWT296	5.88	160	1,700	WT020	0.07	4	42
JWT300	0.10	12	92	WT030	0.08	9	75
JWT310	6.25	160	1,700	WT040	0.19	9	93
JWT320	6.46	160	1,700	WT050	0.19	17	140
JWT330	0.33	32	250	WT060	0.20	14	120
JWT352	9.69	210	2,400	WT070	0.17	14	130
JWT354	10.30	230	2,500	WT080	0.07	9	67
JWT360	0.07	7	55	WT090	0.15	22	160
JWT372	10.36	230	2,500	WT100	0.19	56	300
JWT374 _OUTLET	10.58	230	2,500	WT110	0.19	22	170
MT010	0.29	28	210	WT120	0.05	8	55
MT020	0.09	26	140	WT130	0.10	35	170
MT030	0.16	39	230	WT140	0.13	32	180
MT040	0.31	95	460	WT150	0.23	49	250
MT050	0.12	17	110	WT160	0.11	35	180
MT060	0.19	30	200	WT170	0.12	21	140
MT070	0.20	25	170	WT180	0.10	8	66
MT080	0.06	62	190	WT190	0.06	11	75
MT090	0.04	40	130	WT200	0.30	25	190
MT100	0.06	17	88	WT210	0.27	32	190
MT110	0.12	19	120	WT220	0.19	47	250
PBH4	0.15	29	150	WT230	0.20	71	350
PBHA	0.10	10	130	WT240	0.08	36	160
PBHB1	0.36	51	270	WT250	0.15	63	290
PBHB2	0.36	15	170	WT260	0.14	10	78
PBHC	0.19	11	160	WT270	0.03	11	57
RMN	1.42	86	1,200	WT280	0.27	33	250
RWU _Diversion	3.55	83	1,300	WT290	0.10	15	110
RWU North	3.55	110	1,400	WT300	0.10	12	92
RWU South	3.55	55	1,000	WT310	0.28	31	250
RET020	0.15	29	150	WT320	0.21	27	200
RET030	0.36	71	380	WT330	0.33	32	250
RET040	0.56	95	580	WT340	0.28	19	150
				WT350	0.30	38	280
				WT360	0.07	7	55
				WT370	0.21	7	120

Figure 3-13
Future Hydrology
Falcon DBPS
El Paso County, CO

NOTE: FIGURE MUST BE VIEWED IN COLOR

FILE: G:\gis_projects\Falcon_Creek_DBPS\active\apps\20110613\hydrology_future.mxd, 12/22/2011, wilson_wheeler

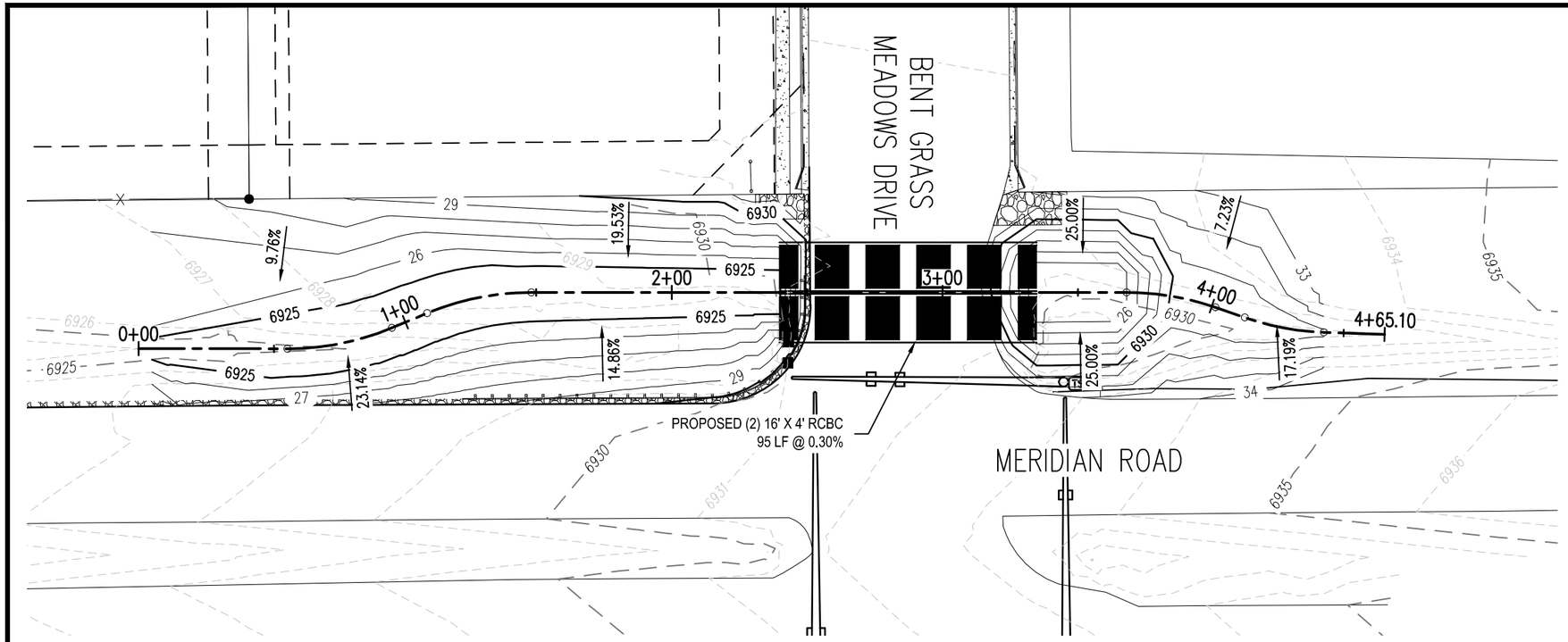


Sub Regional Detention Alternative[1]						
Pond		Q_2 In (cfs)	Q_2 Out (cfs)	Q_{100} In (cfs)	Q_{100} Out (cfs)	Required Volume (AF)[2]
Paint Brush Hills Pond #4	PBH 4	38	29	200	150	1.34
Paint Brush Hills Pond A	PBH A	35	7	170	140	2.62
Paint Brush Hills Pond B1	PBH B1	80	51	420	270	9.17
Paint Brush Hills Pond B2	PBH B2	51	10	270	180	12.09
Paint Brush Hills Pond C	PBH C	56	3	300	140	6.77
Regional Pond MN	R MN	65	32	850	820	7.53
Regional Pond R1	R R1	110	77	1,600	1,500	25.00
Regional Pond R2	R R2	140	140	2,100	2,100	7.90
Regional Pond WU South	R WU	47	22	1,070	930	39.54
Sub Regional Pond SR1	SR 1	54	42	610	510	11.03
Sub Regional Pond SR2	SR 2	65	65	840	840	2.05
Sub Regional Pond SR3	SR 3	72	72	910	910	1.03
Sub Regional Pond SR4	SR 4	130	27	1,000	730	19.37
Sub Regional Pond SR6	SR 6	74	9	390	200	11.82
The Meadows Pond #1	M 1	11	0	75	2	3.25
The Meadows Pond #2	M 2	28	5	210	99	7.94
Woodmen Hills Pond #1 North	WH 1N	65	61	390	260	7.13
Woodmen Hills Pond #1 South	WH 1S	61	10	260	260	8.78
Woodmen Hills Pond #2	WH 2	37	10	270	250	9.18
Woodmen Hills Pond #3	WH 3	105	13	530	360	8.35
Woodmen Hills Pond #4	WH 4	110	15	790	260	40.45
Woodmen Hills Pond #5	WH 5	40	1	130	19	4.10
Woodmen Hills Pond H	WH H	140	110	750	750	2.66

Notes
1: Represents future hydrology with retrofit existing detention ponds and 5 new subregional detention ponds
2: Required volume to highest WSE

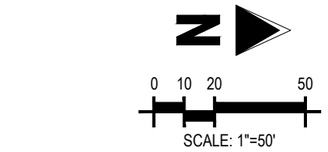
Reach Alternative	Total (ft)
Protect In Place	30,066
Natural Channel Design	32,359
Small Drop Structures w/ Toe Protection	76,812
Large Drop Structures w/ Toe Protection	0

Figure 5-3
Sub-Regional Detention Alternative
Falcon DBPS
El Paso County, CO



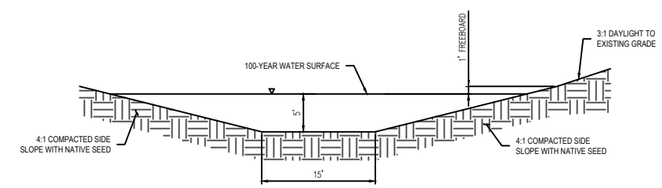
FUTURE MERIDIAN CHANNEL – PLAN

SCALE: 1"=50'



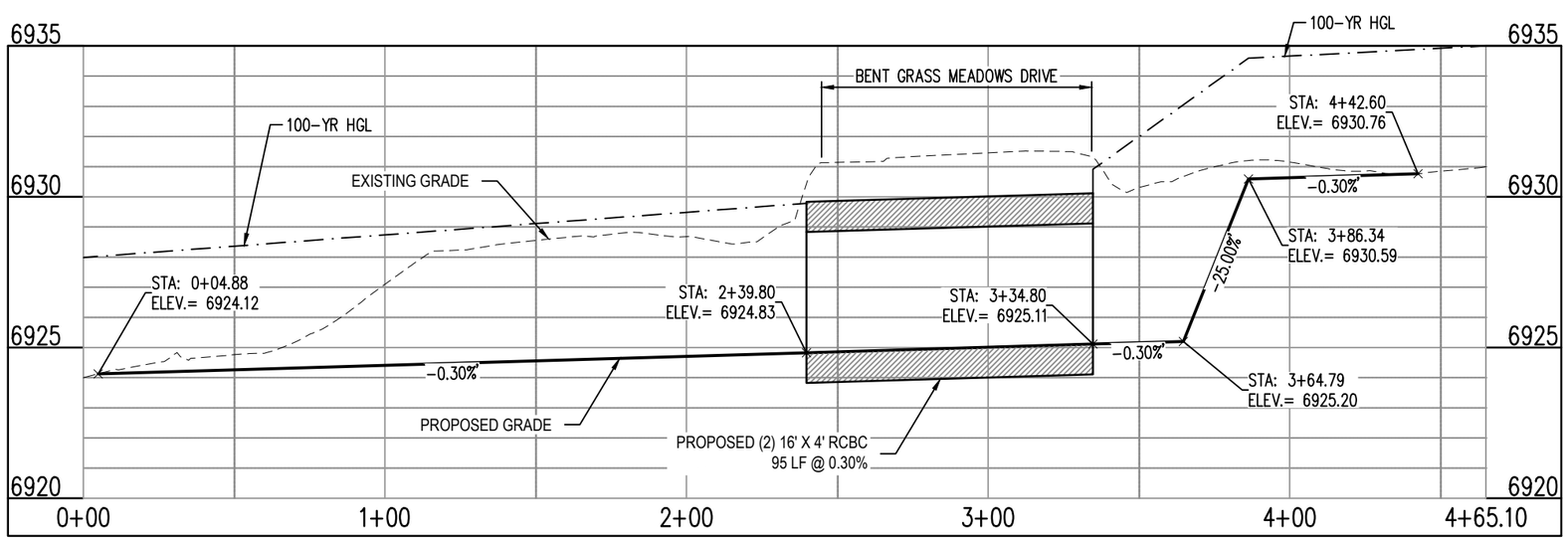
LEGEND

6485	EXISTING MAJOR CONTOUR
6483	EXISTING MINOR CONTOUR
6485	PROPOSED MAJOR CONTOUR
6483	PROPOSED MINOR CONTOUR



ROADSIDE CHANNEL FUTURE SECTION

SCALE: 1"=20'



FUTURE MERIDIAN CHANNEL – PROFILE

SCALE: 1"=50' HORIZONTAL, 1"=5' VERTICAL

Galloway
6162 S. Willow Drive, Suite 320
Greenwood Village, CO 80111
303.770.8884 • GallowayUS.com

Project No:	CLH15.20
Drawn By:	BHB
Checked By:	SMB
Date:	11/15/19

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FINAL DRAINAGE REPORT
EL PASO COUNTY
COLORADO SPRINGS, CO
FUTURE MERIDIAN CHANNEL IMPROVEMENTS EXHIBIT

APPENDIX B

Hydrologic Computations

COMPOSITE % IMPERVIOUS CALCULATIONS: PROPOSED

Subdivision: Meridian Road Improvements
Location: CO, Colorado Springs

Project Name: Meridian Road Improvements
Project No.: CLH000015.20
Calculated By: BHB
Checked By: SMB
Date: 3/23/20

1	2	3	4	5	6	7	8	9	10	11	12
Basin ID	**Total Area (ac)**	**Paved/Gravel Roads**			**Lawns/Undeveloped**			**Roofs**			**Basins Total Weighted % Imp.**
		% Imp.	**Area (ac)**	**Weighted % Imp.**	**% Imp.**	**Area (ac)**	**Weighted % Imp.**	**% Imp.**	**Area (ac)**	**Weighted % Imp.**	
H-1	2.03	100	0.96	47.3	2	1.07	1.1	90	0.00	0.0	48.4
P-1	2.03	100	1.29	63.5	2	0.74	0.7	90	0.00	0.0	64.2
OS-5	14.13	100	0.17	1.2	2	13.74	1.9	90	0.22	1.4	4.5
OS-6	5.81	100	0.00	0.0	2	5.81	2.0	90	0.00	0.0	2.0

NOTES:

% Impervious values are taken directly from Table 6-6 in the Colorado Springs DCM Vol. 1. CH. 6 (Referencing UDFCD 2001)

COMPOSITE RUNOFF COEFFICIENT CALCULATIONS: PROPOSED

Subdivision: Meridian Road Improvements
Location: CO, Colorado Springs

Project Name: Meridian Road Improvements
Project No.: CLH000015.20
Calculated By: BHB
Checked By: SMB
Date: 3/23/20

1	2	3	4	5	6	7	8	9	10	11	12	13
Basin ID	**Total Area (ac)**	**Paved/Gravel Roads**			**Lawns/Undeveloped**			**Roofs**			**Composite C_5**	**Composite C_{100}**
		C_5	**C_{100}**	**Area (ac)**	**C_5**	**C_{100}**	**Area (ac)**	**C_5**	**C_{100}**	**Area (ac)**		
H-1	2.03	0.90	0.96	0.96	0.09	0.36	1.07	0.73	0.81	0.00	0.47	0.64
P-1	2.03	0.90	0.96	1.29	0.09	0.36	0.74	0.73	0.81	0.00	0.60	0.74
OS-5	14.13	0.90	0.96	0.17	0.09	0.36	13.71	0.73	0.81	0.22	0.11	0.37
OS-6	5.81	0.90	0.96	0.00	0.09	0.36	5.81	0.73	0.81	0.00	0.09	0.36

NOTES:
C values are taken directly from Table 6-6 in the Colorado Springs DCM Vol. 1. CH. 6 (Referencing UDFCD 2001)
Coeffficients use HSG A&B soils - Refer to "Appendix A: Exhibits and Figures" for soil map

STANDARD FORM SF-2: PROPOSED
TIME OF CONCENTRATION

Subdivision: Meridian Road Improvements
Location: CO, Colorado Springs

Project Name: Meridian Road Improvements
Project No.: CLH000015.20
Calculated By: BHB
Checked By: SMB
Date: 3/23/20

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SUB-BASIN						INITIAL/OVERLAND			TRAVEL TIME					Tc CHECK			
DATA						(T_i)			(T_t)					(URBANIZED BASINS)			FINAL
BASIN ID	D.A. (AC)	Hydrologic Soils Group	Impervious (%)	C_5	C_{100}	L (FT)	S (%)	T_i (MIN)	L (FT)	S (%)	Cv	VEL. (FPS)	T_t (MIN)	COMP. T_c (MIN)	TOTAL LENGTH(FT)	Urbanized T_c (MIN)	T_c (MIN)
H-1	2.03	A	48.4	0.47	0.64	100	6.0	6.4	1230	1.7	15	2.0	10.48	16.8	1330.0	17.4	16.8
P-1	2.03	A	64.2	0.60	0.74	100	6.0	5.0	1230	1.7	15	2.0	10.48	15.5	1330.0	17.4	15.5
OS-5	14.13	A	4.5	0.37	0.11	300	2.5	23.1	1400	3.0	15	2.6	9.0	32.1	1700.0	19.4	19.4
OS-6	5.81	A	2.0	0.36	0.09	300	2.0	25.4	400	2.0	15	2.1	3.1	28.6	700.0	13.9	13.9

NOTES:

T_i = (0.395*(1.1 - C_5)*(L)^0.5)/((S)^0.33), S in ft/ft

T_t=L/60V (Velocity From Fig. 501)

Velocity V=Cv*S^0.5, S in ft/ft

Tc Check = 10+L/180

For Urbanized basins a minimum T_c of 5.0 minutes is required.

For non-urbanized basins a minimum T_c of 10.0 minutes is required

STANDARD FORM SF-3: PROPOSED

STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Meridian Road Improvements
Location: CO, Colorado Springs
Design Storm: 5-Year

Project Name: Meridian Road Improvements
Project No.: CLH000015.20
Calculated By: BHB
Checked By: SMB
Date: 3/23/20

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Slope (%)	Street Flow (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	Tt (min)	
	H1A							850.0				850.0									Flow from Falcon DBPS
		H-1	2.03	0.47	16.8	0.95	3.35	3.2													Historic flow into channel from Meridian Road and Bent Grass Meadows Dr.
		P-1	2.03	0.60	15.5	1.22	3.47	4.2													Proposed flow into channel from Meridian Road and Bent Grass Meadows Dr.
Value from the Meadows Fil. 3 FDR (DP-12)	30							98.1													Total flow from existing culvert into basin OS-5 = 98.1 cfs
		OS-5	14.13	0.11	19.4	1.55	3.13	4.9													
	31											103.0									Total flow into basin OS-6 = 103 cfs
		OS-6	5.38	0.45	13.9	2.42	3.64	8.8													Basin to be developed in the future
	32											111.8									Flows from Sediment pond routed East towards Meridian Road

STANDARD FORM SF-3: PROPOSED

STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Meridian Road Improvements
Location: CO, Colorado Springs
Design Storm: 100-Year

Project Name: Meridian Road Improvements
Project No.: CLH000015.20
Calculated By: BHB
Checked By: SMB
Date: 3/23/20

		DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			
STREET	Design Point	Basin ID	Area (Ac)	Runoff Coeff.	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Slope (%)	Street Flow (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	Tt (min)	REMARKS
	H1A							850.0				850.0									Flow from Falcon DBPS
		H-1	2.03	0.64	16.8	1.30	5.62	7.3													Historic flow into channel from Meridian Road and Bent Grass Meadows Dr.
		P-1	2.03	0.74	15.5	1.50	5.82	8.7													Proposed flow into channel from Meridian Road and Bent Grass Meadows Dr.
Value from the Meadows Fil. 3 FDR (DP-12)	30							226.0													Total flow from existing culvert into basin OS-5 = 226.0 cfs
		OS-5	14.13	0.37	19.4	5.23	5.26	27.5													
	31											253.5									Total flow into basin OS-6 = 253.5 cfs
		OS-6	5.38	0.59	13.9	3.17	6.10	19.3													Basin to be developed in the future
	32											272.8									Flows from Sediment pond routed East towards Meridian Road

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
WT020	0.0671383	41.9	01Jan2011, 06:21	4.8
JWT020	0.0671383	41.9	01Jan2011, 06:21	4.8
RWT030	0.0671383	41.9	01Jan2011, 06:29	4.8
WT030	0.0764732	75.3	01Jan2011, 06:07	5.5
JWT030	0.1436115	85.4	01Jan2011, 06:09	10.3
RWT042	0.1436115	85.3	01Jan2011, 06:15	10.3
WT010	0.1353300	88.9	01Jan2011, 06:17	9.3
JWT010	0.1353300	88.9	01Jan2011, 06:17	9.3
RWT044	0.1353300	88.8	01Jan2011, 06:24	9.3
JWT042	0.2789415	167.0	01Jan2011, 06:21	19.6
RWT046	0.2789415	166.7	01Jan2011, 06:28	19.6
WT040	0.1850600	92.7	01Jan2011, 06:28	12.8
JWT044	0.4640015	259.4	01Jan2011, 06:28	32.4
RWT054	0.4640015	258.8	01Jan2011, 06:35	32.3
WT060	0.1956300	116.8	01Jan2011, 06:26	15.1
WT050	0.1899300	139.4	01Jan2011, 06:19	15.3
JWT050	0.8495615	475.4	01Jan2011, 06:31	62.7
RWT092	0.8495615	475.2	01Jan2011, 06:32	62.7
WT070	0.1711000	133.9	01Jan2011, 06:12	11.8
JWT070	0.1711000	133.9	01Jan2011, 06:12	11.8
RWT080	0.1711000	133.4	01Jan2011, 06:22	11.8
WT080	0.0691596	67.3	01Jan2011, 06:10	5.6
Sub Regional Pond SR1	1.0898211	513.2	01Jan2011, 06:40	78.4
JWT080	1.0898211	513.2	01Jan2011, 06:40	78.4
RWT094	1.0898211	512.4	01Jan2011, 06:45	78.3
WT100-REV	0.1292700	203.0	01Jan2011, 06:04	12.9
W26-REV	0.0720000	103.6	01Jan2011, 06:03	6.4
WS3-1	0.0720000	102.8	01Jan2011, 06:10	6.4
Paint Brush Hills Pond C	0.2012700	64.4	01Jan2011, 06:26	19.2
WT090	0.1533300	162.4	01Jan2011, 06:09	12.8
JWT090	1.4444211	595.9	01Jan2011, 06:44	110.2
RWT122	1.4444211	595.5	01Jan2011, 06:45	110.2
WT110	0.1942800	169.9	01Jan2011, 06:14	16.2
JWT110	1.6387011	651.0	01Jan2011, 06:43	126.4
RWT124	1.6387011	650.8	01Jan2011, 06:47	126.3
WT130-REV	0.1016250	130.0	01Jan2011, 06:11	10.9
Paint Brush Hills Pond A	0.1016250	53.8	01Jan2011, 06:32	10.9
WT120-REV	0.0430300	51.1	01Jan2011, 06:08	3.8

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
JWT120	1.7833561	703.6	01Jan2011, 06:46	140.9
RWT172	1.7833561	702.5	01Jan2011, 06:58	140.5
WT140-REV	0.1445300	194.2	01Jan2011, 06:12	16.8
JWT140	0.1445300	194.2	01Jan2011, 06:12	16.8
RWT150	0.1445300	193.3	01Jan2011, 06:22	16.8
WT150-REV	0.1308100	202.5	01Jan2011, 06:08	15.0
Paint Brush Hills Pond...	0.2753400	235.6	01Jan2011, 06:29	31.8
W34B2-REV	0.0935900	141.8	01Jan2011, 06:07	10.2
Paint Brush Hills Pond...	0.3689300	234.3	01Jan2011, 06:43	38.9
JWT150	0.3689300	234.3	01Jan2011, 06:43	38.9
RWT160	0.3689300	234.2	01Jan2011, 06:49	38.8
WT160-REV	0.0734800	109.9	01Jan2011, 06:06	7.5
JWT160	0.4424100	244.8	01Jan2011, 06:48	46.3
RWT174	0.4424100	244.7	01Jan2011, 06:56	46.2
WT170-REV	0.1060150	85.2	01Jan2011, 06:19	9.2
W34-CY-REV	0.0465469	38.1	01Jan2011, 06:16	3.8
JWT172	2.3783280	981.9	01Jan2011, 06:56	199.7
RWT176	2.3783280	981.6	01Jan2011, 06:57	199.7
Sub Regional Pond SR2	2.3783280	972.9	01Jan2011, 07:01	194.8
JWT174	2.3783280	972.9	01Jan2011, 07:01	194.8
RWT180	2.3783280	972.1	01Jan2011, 07:10	194.2
WT180-REV	0.0409400	29.3	01Jan2011, 06:19	3.2
JWT180	2.4192680	978.0	01Jan2011, 07:10	197.4
RWT202	2.4192680	977.3	01Jan2011, 07:21	196.8
WT200	0.3017100	186.8	01Jan2011, 06:30	26.0
WT190	0.0574561	74.7	01Jan2011, 06:05	5.0
The Meadows Pond #1	0.0574561	2.1	01Jan2011, 08:29	2.8
JWT190	0.0574561	2.1	01Jan2011, 08:29	2.8
RWT204	0.0574561	2.1	01Jan2011, 08:55	2.7
JWT200	2.7784341	1041.0	01Jan2011, 07:19	225.5
RWT210	2.7784341	1040.5	01Jan2011, 07:24	225.1
WT210	0.2654600	187.9	01Jan2011, 06:35	28.0
JWT210	3.0438941	1113.0	01Jan2011, 07:23	253.1
RWT232	3.0438941	1112.6	01Jan2011, 07:27	252.7
WT220	0.1895300	250.4	01Jan2011, 06:12	21.3
JWT220	0.1895300	250.4	01Jan2011, 06:12	21.3
RWT234	0.1895300	249.6	01Jan2011, 06:20	21.3
JWT232	3.2334241	1138.4	01Jan2011, 07:26	274.0
RWT236	3.2334241	1138.3	01Jan2011, 07:26	274.0

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
WT230	0.1981800	346.7	01Jan2011, 06:05	23.1
JWT234	3.4316041	1155.6	01Jan2011, 07:26	297.0
RWT240	3.4316041	1155.0	01Jan2011, 07:29	296.8
WT240	0.0761461	160.3	01Jan2011, 06:01	9.1
Regional Pond WU No...	3.5077502	1160.9	01Jan2011, 07:30	304.7
Regional Pond WU Di...	3.5077502	1122.2	01Jan2011, 07:30	261.4
Old Meridian	0.0335900	85.0	01Jan2011, 06:07	6.1
RWT-OM	0.0335900	84.2	01Jan2011, 06:12	6.1
Regional Pond WU So...	3.5413402	997.3	01Jan2011, 07:47	255.2
RWT240_Diversion R...	0.0000000	38.8	01Jan2011, 07:35	43.1
JWT240	3.5413402	1036.0	01Jan2011, 07:47	298.4
RWT250	3.5413402	1035.7	01Jan2011, 07:48	298.3
WT250	0.1469500	291.4	01Jan2011, 06:02	17.1
JWT250	3.6882902	1048.0	01Jan2011, 07:48	315.4
RWT260	3.6882902	1047.5	01Jan2011, 07:58	314.3
WT260	0.1388002	77.5	01Jan2011, 06:34	11.5
JWT260	3.8270904	1061.8	01Jan2011, 07:58	325.9
RWT291	3.8270904	1061.7	01Jan2011, 08:00	325.6
WT270	0.0324738	57.1	01Jan2011, 06:04	3.6
JWT270	0.0324738	57.1	01Jan2011, 06:04	3.6
RWT292	0.0324738	56.9	01Jan2011, 06:08	3.5
JWT292	3.8595642	1064.3	01Jan2011, 08:00	329.2
RWT295	3.8595642	1064.2	01Jan2011, 08:01	329.0
WT280	0.2669500	251.8	01Jan2011, 06:12	22.3
JWT280	0.2669500	251.8	01Jan2011, 06:12	22.3
RWT294	0.2669500	251.2	01Jan2011, 06:15	22.2
JWT294	4.1265142	1082.0	01Jan2011, 08:01	351.3
RWT296	4.1265142	1081.4	01Jan2011, 08:07	350.6
MT040	0.3084200	455.2	01Jan2011, 06:11	38.1
MT030	0.1566300	228.6	01Jan2011, 06:05	15.1
MT020	0.0902033	143.1	01Jan2011, 06:04	9.0
JMT020	0.0902033	143.1	01Jan2011, 06:04	9.0
RMT030	0.0902033	141.8	01Jan2011, 06:17	8.9
JMT030	0.2468333	294.4	01Jan2011, 06:07	24.0
RMT040	0.2468333	293.0	01Jan2011, 06:11	24.0
Woodmen Hills Pond H	0.5552533	751.7	01Jan2011, 06:11	61.7
JMT040	0.5552533	751.7	01Jan2011, 06:11	61.7
RMT050	0.5552533	745.8	01Jan2011, 06:14	61.7
MT050	0.1186100	109.7	01Jan2011, 06:18	11.4

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
JMT050	0.6738633	851.9	01Jan2011, 06:14	73.1
RMT064	0.6738633	847.0	01Jan2011, 06:21	73.0
MT060	0.1595000	197.7	01Jan2011, 06:08	14.8
Sub Regional Pond SR4	0.8333633	692.0	01Jan2011, 06:34	83.7
JMT060	0.8333633	692.0	01Jan2011, 06:34	83.7
RMT070	0.8333633	690.2	01Jan2011, 06:40	83.5
MT010	0.2898900	206.3	01Jan2011, 06:24	25.0
The Meadows Pond #2	0.2898900	99.3	01Jan2011, 06:53	23.4
JMT010	0.2898900	99.3	01Jan2011, 06:53	23.4
RMT062	0.2898900	99.2	01Jan2011, 07:02	23.3
MT060a	0.0300000	46.8	01Jan2011, 06:03	2.8
School Site	0.3198900	100.4	01Jan2011, 07:09	24.7
RMT060a	0.3198900	100.4	01Jan2011, 07:13	24.7
MT070	0.1994800	170.2	01Jan2011, 06:22	19.6
JMT070	1.3527333	838.1	01Jan2011, 06:39	127.8
RMT080	1.3527333	837.6	01Jan2011, 06:41	127.8
MT080	0.0638371	191.9	01Jan2011, 06:00	11.0
Regional Pond MN	1.4165704	825.9	01Jan2011, 06:46	136.3
JMT080	1.4165704	825.9	01Jan2011, 06:46	136.3
RMT102	1.4165704	824.5	01Jan2011, 06:52	136.0
MT090	0.0435103	127.4	01Jan2011, 06:00	7.1
Woodmen Hills Pond #5	0.0435103	18.6	01Jan2011, 06:07	5.9
JMT090	0.0435103	18.6	01Jan2011, 06:07	5.9
RMT090	0.0435103	18.6	01Jan2011, 06:08	5.9
JMT104	0.0435103	18.6	01Jan2011, 06:08	5.9
RMT104	0.0435103	18.6	01Jan2011, 06:12	5.9
JMT102	1.4600807	839.9	01Jan2011, 06:52	141.9
RMT106	1.4600807	836.2	01Jan2011, 06:54	141.8
MT100	0.0557682	88.2	01Jan2011, 06:05	5.9
JMT106	1.5158489	843.3	01Jan2011, 06:54	147.7
RMT112	1.5158489	840.8	01Jan2011, 07:06	147.1
MT110	0.1163900	117.4	01Jan2011, 06:16	11.5
JMT110	1.6322389	862.3	01Jan2011, 07:05	158.6
RMT114	1.6322389	861.5	01Jan2011, 07:10	158.4
WT290	0.1037800	110.3	01Jan2011, 06:09	8.7
Regional Pond R1	5.8625331	1435.5	01Jan2011, 08:02	510.0
JWT296	5.8625331	1435.5	01Jan2011, 08:02	510.0
RWT314	5.8625331	1435.2	01Jan2011, 08:07	509.2
WT300	0.0970199	91.6	01Jan2011, 06:12	8.1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
JWT300	0.0970199	91.6	01Jan2011, 06:12	8.1
RWT312	0.0970199	91.1	01Jan2011, 06:29	8.1
WT310	0.2774200	246.7	01Jan2011, 06:13	22.3
JWT310	6.2369730	1464.7	01Jan2011, 07:26	539.6
RWT320	6.2369730	1462.3	01Jan2011, 07:32	538.6
WT320	0.2061400	200.6	01Jan2011, 06:11	17.2
JWT320	6.4431130	1477.3	01Jan2011, 07:32	555.7
RWT352	6.4431130	1474.4	01Jan2011, 07:42	554.5
ET020	0.2131700	360.5	01Jan2011, 06:06	24.8
ET010	0.1451300	198.3	01Jan2011, 06:11	16.4
Paint Brush Hills Pond...	0.1451300	150.9	01Jan2011, 06:20	16.3
JET010	0.1451300	150.9	01Jan2011, 06:20	16.3
RET020	0.1451300	150.0	01Jan2011, 06:37	16.3
Sub Regional Pond SR6	0.3583000	195.4	01Jan2011, 06:41	37.9
JET020	0.3583000	195.4	01Jan2011, 06:41	37.9
RET030	0.3583000	194.9	01Jan2011, 07:02	37.5
ET030	0.2042800	242.0	01Jan2011, 06:15	23.0
JET030	0.5625800	266.0	01Jan2011, 06:43	60.5
RET040	0.5625800	265.2	01Jan2011, 06:50	60.3
Woodmen Hills Pond ...	0.7117200	263.5	01Jan2011, 07:09	75.5
ET040	0.1491400	165.7	01Jan2011, 06:14	15.3
Woodmen Hills Pond ...	0.7117200	261.1	01Jan2011, 07:18	69.5
JET040	0.7117200	261.1	01Jan2011, 07:18	69.5
RET050	0.7117200	261.1	01Jan2011, 07:23	69.4
ET050	0.1171900	197.1	01Jan2011, 06:03	11.6
Woodmen Hills Pond #2	0.8289100	250.3	01Jan2011, 07:46	79.3
JET050	0.8289100	250.3	01Jan2011, 07:46	79.3
RET060	0.8289100	250.3	01Jan2011, 07:53	79.1
ET060	0.2854300	529.3	01Jan2011, 06:01	29.3
Woodmen Hills Pond #3	1.1143400	360.9	01Jan2011, 06:06	105.9
JET060	1.1143400	360.9	01Jan2011, 06:06	105.9
RET070	1.1143400	356.7	01Jan2011, 06:16	105.6
ET070	0.2497500	461.0	01Jan2011, 06:02	27.3
JET070	1.3640900	636.4	01Jan2011, 06:04	132.9
RET080	1.3640900	517.5	01Jan2011, 06:23	131.3
ET080	0.2916400	517.9	01Jan2011, 06:07	37.1
Woodmen Hills Pond #4	1.6557300	288.0	01Jan2011, 07:00	139.2
JET080	1.6557300	288.0	01Jan2011, 07:00	139.2
RET090	1.6557300	287.3	01Jan2011, 07:03	139.0

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
ET090	0.1242400	133.0	01Jan2011, 06:22	14.9
JET090	1.7799700	330.8	01Jan2011, 06:59	153.9
RET100	1.7799700	330.7	01Jan2011, 07:01	153.8
ET100	0.0480615	72.0	01Jan2011, 06:02	4.0
JET100	1.8280315	335.4	01Jan2011, 07:01	157.8
RET110	1.8280315	335.2	01Jan2011, 07:05	157.6
ET110	0.2260300	198.8	01Jan2011, 06:12	17.5
JET110	2.0540615	362.1	01Jan2011, 07:03	175.1
RET120	2.0540615	361.3	01Jan2011, 07:09	174.7
ET120	0.1091300	89.4	01Jan2011, 06:14	8.5
JET120	2.1631915	403.2	01Jan2011, 06:17	183.2
RET152	2.1631915	402.2	01Jan2011, 06:24	182.9
ET130	0.1348100	85.4	01Jan2011, 06:27	11.2
JET130	0.1348100	85.4	01Jan2011, 06:27	11.2
RET140	0.1348100	84.7	01Jan2011, 06:54	11.1
ET140	0.2675900	122.8	01Jan2011, 06:46	22.2
JET140	0.4024000	204.8	01Jan2011, 06:51	33.3
RET154	0.4024000	204.4	01Jan2011, 07:05	33.2
JET152	2.5655915	572.3	01Jan2011, 07:10	216.1
RET156	2.5655915	572.0	01Jan2011, 07:14	215.8
ET150	0.1777300	136.2	01Jan2011, 06:18	14.3
JET154	2.7433215	595.8	01Jan2011, 07:12	230.1
RET162	2.7433215	595.1	01Jan2011, 07:25	228.9
ET160	0.1889200	137.2	01Jan2011, 06:23	16.3
JET160	2.9322415	633.6	01Jan2011, 06:38	245.2
RET164	2.9322415	629.0	01Jan2011, 06:47	244.7
WT350	0.3037700	276.7	01Jan2011, 06:14	26.3
JWT352	9.6791245	2103.9	01Jan2011, 07:39	825.5
RWT354	9.6791245	2103.7	01Jan2011, 07:39	825.5
WT330	0.3266800	249.3	01Jan2011, 06:19	27.2
JWT330	0.3266800	249.3	01Jan2011, 06:19	27.2
RWT344	0.3266800	248.4	01Jan2011, 06:25	27.2
WT340	0.2780000	147.3	01Jan2011, 06:37	23.1
JWT354	10.2838045	2180.8	01Jan2011, 07:39	875.7
RWT372	10.2838045	2178.3	01Jan2011, 07:44	874.6
WT360	0.0656830	54.8	01Jan2011, 06:15	5.3
JWT360	0.0656830	54.8	01Jan2011, 06:15	5.3
RWT374	0.0656830	54.6	01Jan2011, 06:24	5.3
Regional Pond R2	10.3494875	2181.6	01Jan2011, 07:46	876.5

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
JWT372	10.3494875	2181.6	01Jan2011, 07:46	876.5
RWT376	10.3494875	2176.1	01Jan2011, 07:56	874.3
WT370	0.2147600	123.3	01Jan2011, 06:12	11.5
JWT374_OUTLET	10.5642475	2186.2	01Jan2011, 07:56	885.7
FS010	0.1220000	74.9	01Jan2011, 06:16	7.7
JFS010_OUTLET	0.1220000	74.9	01Jan2011, 06:16	7.7

Project: Aug15_Working_Falcon_DBPS_S

Simulation Run: FU 100-yr Reservoir: Regional Pond MN

Start of Run:	01Jan2011, 00:00	Basin Model:	Falcon_DBPS_Future
End of Run:	02Jan2011, 00:00	Meteorologic Model:	100-yr
Compute Time:	24Mar2020, 10:58:10	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	847.9 (CFS)	Date/Time of Peak Inflow :	01Jan2011, 06:41
Peak Outflow :	825.9 (CFS)	Date/Time of Peak Outflow :	01Jan2011, 06:46
Total Inflow :	138.8 (AC-FT)	Peak Storage :	7.5 (AC-FT)
Total Outflow :	136.3 (AC-FT)	Peak Elevation :	6854.0 (FT)

Project: Aug15_Working_Falcon_DBPS_S

Simulation Run: FU 100-yr Reservoir: Sub Regional Pond SR4

Start of Run:	01Jan2011, 00:00	Basin Model:	Falcon_DBPS_Future
End of Run:	02Jan2011, 00:00	Meteorologic Model:	100-yr
Compute Time:	24Mar2020, 10:58:10	Control Specifications:	24-hr Storm

Volume Units: IN

Computed Results

Peak Inflow :	951.8 (CFS)	Date/Time of Peak Inflow :	01Jan2011, 06:20
Peak Outflow :	692.0 (CFS)	Date/Time of Peak Outflow :	01Jan2011, 06:34
Total Inflow :	1.98 (IN)	Peak Storage :	18.8 (AC-FT)
Total Outflow :	1.88 (IN)	Peak Elevation :	6897.9 (FT)

APPENDIX C

Hydraulic Computations

Existing Channel Capacity

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.035	
Channel Slope	1.75	%
Normal Depth	3.00	ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)

Results

Discharge	259.64	ft^3/s
Flow Area	36.00	ft^2
Wetted Perimeter	24.74	ft
Hydraulic Radius	1.46	ft
Top Width	24.00	ft
Critical Depth	3.05	ft
Critical Slope	0.01616	ft/ft
Velocity	7.21	ft/s
Velocity Head	0.81	ft
Specific Energy	3.81	ft
Froude Number	1.04	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.00	ft
Critical Depth	3.05	ft
Channel Slope	1.75	%
Critical Slope	0.01616	ft/ft

Existing Channel - DBPS Flow

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	1.75	%
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Discharge	580.00	ft³/s

Are side slopes 3:1?

SLOPES RANGE FROM 4 TO 6:1. 4 WAS MOST PREVALENT. REFER TO SECTIONS IN CD PLAN SET.

Results

Normal Depth		4.06	ft
Flow Area		65.78	ft²
Wetted Perimeter		33.44	ft
Hydraulic Radius		1.97	ft
Top Width		32.44	ft
Critical Depth		4.20	ft
Critical Slope		0.01451	ft/ft
Velocity		8.82	ft/s
Velocity Head		1.21	ft
Specific Energy		5.26	ft
Froude Number		1.09	TRM ADDED
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.06	ft
Critical Depth	4.20	ft
Channel Slope	1.75	%
Critical Slope	0.01451	ft/ft

USDA NRCS Part 650 Engineering Field Handbook, Chapter 7 Grassed Waterways. 2007.
By: TJE
Date: 3/23/2020

Variable		**Unit**	**Source**
Allowable Effective Stress, Ta	0.03	lb/ft2	Table 7-1: "Erodible"
Void Ratio, e	0.65		Table 7-2: "Dense angular-grained silty sand
Void Ratio Correction Factor, Ce	1.04		Table 7-7
Vegetation Height, h	0.21	ft	Estimated from photos
Stem Density, M	116.7	#/sf	Table 7-3: "Kentucky Bluegrass, Poor Condition"
Retardance Curve Index, C1	3.3		Eq 7-5
Allowable Vegetative Stress, Tva	**2.46**		**Eq 7-4**
Vegetative Cover Factor, Cf	0.87		Table 7-3
Unit Weight of water	62.4	lb/ft3	
Maximum Flow Depth, D	3.0	ft	HEC-RAS "Revised Conditions" model
Manning's Roughness, n	0.035		HEC-RAS Model
Channel Slope, S	0.0175	ft/ft	
Erosional Effective Stress, Te	0.0846		Eq 7-1
Total Hydraulic Stress	3.28	lb/sf	Eq 7-6
Max Shear in Existing Condition	**3.28**	**lb/sf**	**NOT ADEQUATE**

Bent Grass & Meridian Proposed Channel

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.30	%
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	15.00	ft
Discharge	850.00	ft^3/s

Results

Normal Depth	4.95	ft
Flow Area	172.40	ft^2
Wetted Perimeter	55.84	ft
Hydraulic Radius	3.09	ft
Top Width	54.62	ft
Critical Depth	3.43	ft
Critical Slope	0.01384	ft/ft
Velocity	4.93	ft/s
Velocity Head	0.38	ft
Specific Energy	5.33	ft
Froude Number	0.49	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.95	ft
Critical Depth	3.43	ft
Channel Slope	0.30	%
Critical Slope	0.01384	ft/ft

Address proposed stabilization.

FOR FUTURE CONDITION NO TRM NEEDED, MEETS VELOCITY, FR, ETC

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 850 cfs

Maximum Flow: 850 cfs

Table 1 - Summary of Culvert Flows at Crossing: Bent Grass & Meridian Existing

Headwater Elevation (ft)	Total Discharge (cfs)	Existing Culvert Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6928.05	0.00	0.00	0.00	1
6930.20	85.00	85.00	0.00	1
6931.94	170.00	167.78	2.11	11
6932.35	255.00	182.24	72.54	5
6932.62	340.00	191.34	148.59	5
6932.85	425.00	198.73	226.00	4
6933.06	510.00	205.16	304.66	4
6933.26	595.00	210.91	383.97	4
6933.44	680.00	216.15	463.77	4
6933.61	765.00	220.96	543.59	3
6933.78	850.00	225.50	624.27	3
6931.90	166.14	166.14	0.00	Overtopping

Rating Curve Plot for Crossing: Bent Grass & Meridian Existing

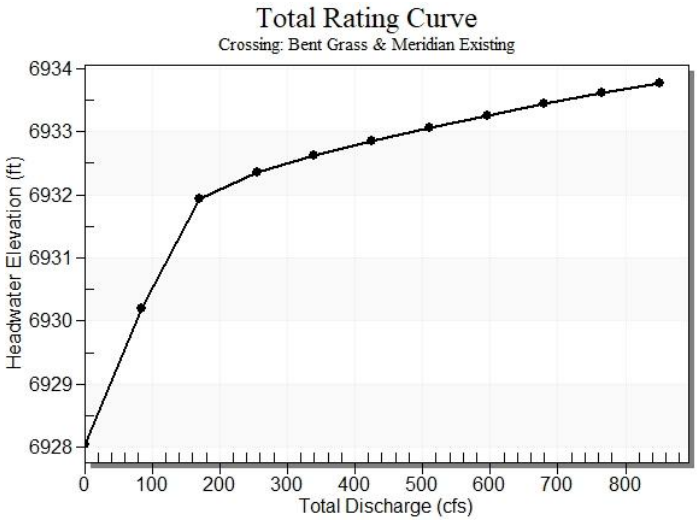


Table 2 - Culvert Summary Table: Existing Culvert

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	6928.05	0.000	0.000	0-NF	0.000	0.000	0.710	0.000	0.000	0.000
85.00	85.00	6930.20	2.148	1.427	1-S2n	1.171	1.425	1.171	0.914	7.716	4.985
170.00	167.78	6931.94	3.893	3.342	5-S2n	1.825	2.027	1.883	1.345	8.849	6.204
255.00	182.24	6932.35	4.298	3.961	3-M2t	2.417	2.099	2.386	1.676	8.209	7.012
340.00	191.34	6932.62	4.571	4.551	4-FFf	2.417	2.137	2.417	1.953	8.597	7.630
425.00	198.73	6932.85	4.804	4.998	4-FFf	2.417	2.167	2.417	2.196	8.929	8.137
510.00	205.16	6933.06	5.014	5.400	4-FFf	2.417	2.187	2.417	2.414	9.218	8.570
595.00	210.91	6933.26	5.208	5.769	4-FFf	2.417	2.206	2.417	2.613	9.476	8.949
680.00	216.15	6933.44	5.390	6.111	4-FFf	2.417	2.219	2.417	2.796	9.712	9.288
765.00	220.96	6933.61	5.561	6.432	4-FFf	2.417	2.230	2.417	2.967	9.928	9.595
850.00	225.50	6933.78	5.727	6.736	4-FFf	2.417	2.245	2.417	3.128	10.132	9.877

****

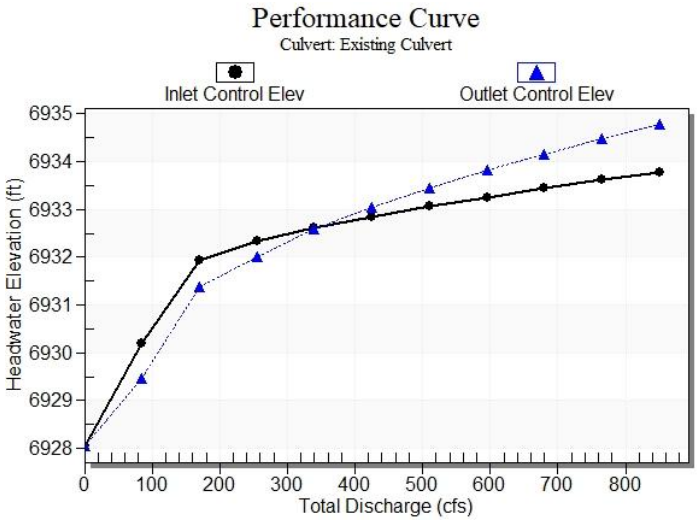
Straight Culvert

Inlet Elevation (invert): 6928.05 ft, Outlet Elevation (invert): 6927.34 ft

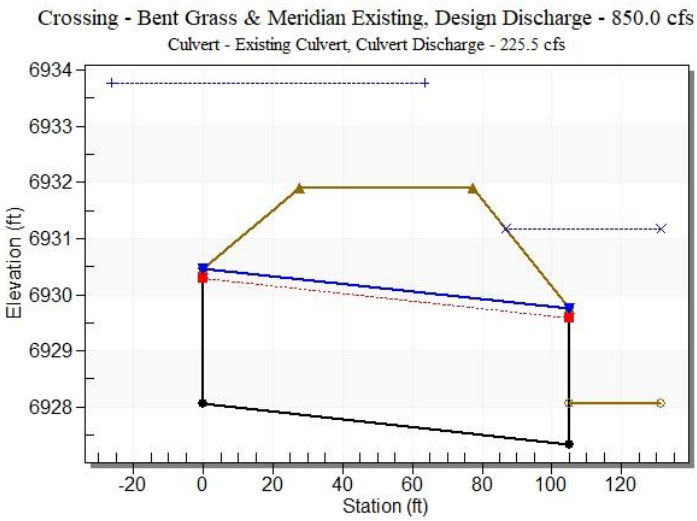
Culvert Length: 105.00 ft, Culvert Slope: 0.0068

****

Culvert Performance Curve Plot: Existing Culvert



Water Surface Profile Plot for Culvert: Existing Culvert



Site Data - Existing Culvert

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 6928.05 ft

Outlet Station: 105.00 ft

Outlet Elevation: 6927.34 ft

Number of Barrels: 3

Culvert Data Summary - Existing Culvert

Barrel Shape: Elliptical

Barrel Span: 45.00 in

Barrel Rise: 29.00 in

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Bent Grass & Meridian Existing)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	6928.05	0.00	0.00	0.00	0.00
85.00	6928.96	0.91	4.99	1.14	1.00
170.00	6929.39	1.34	6.20	1.68	1.06
255.00	6929.73	1.68	7.01	2.09	1.09
340.00	6930.00	1.95	7.63	2.44	1.11
425.00	6930.25	2.20	8.14	2.74	1.13
510.00	6930.46	2.41	8.57	3.01	1.15
595.00	6930.66	2.61	8.95	3.26	1.16
680.00	6930.85	2.80	9.29	3.49	1.17
765.00	6931.02	2.97	9.59	3.70	1.18
850.00	6931.18	3.13	9.88	3.90	1.19

Tailwater Channel Data - Bent Grass & Meridian Existing

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 15.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0350

Channel Invert Elevation: 6928.05 ft

Roadway Data for Crossing: Bent Grass & Meridian Existing

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 6931.90 ft

Roadway Surface: Paved

Roadway Top Width: 50.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 108 cfs

Maximum Flow: 108 cfs

Table 1 - Summary of Culvert Flows at Crossing: Bent Grass & Meridian Prop Ellip

Headwater Elevation (ft)	Total Discharge (cfs)	Proposed Ellip Culverts - BG Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6928.05	0.00	0.00	0.00	1
6928.86	10.80	10.80	0.00	1
6929.22	21.60	21.60	0.00	1
6929.55	32.40	32.40	0.00	1
6929.85	43.20	43.20	0.00	1
6930.13	54.00	54.00	0.00	1
6930.41	64.80	64.80	0.00	1
6930.71	75.60	75.60	0.00	1
6931.04	86.40	86.40	0.00	1
6931.40	97.20	97.20	0.00	1
6931.79	108.00	108.00	0.00	1
6931.90	110.72	110.72	0.00	Overtopping

Rating Curve Plot for Crossing: Bent Grass & Meridian Prop Ellip Pipe - diverted flow

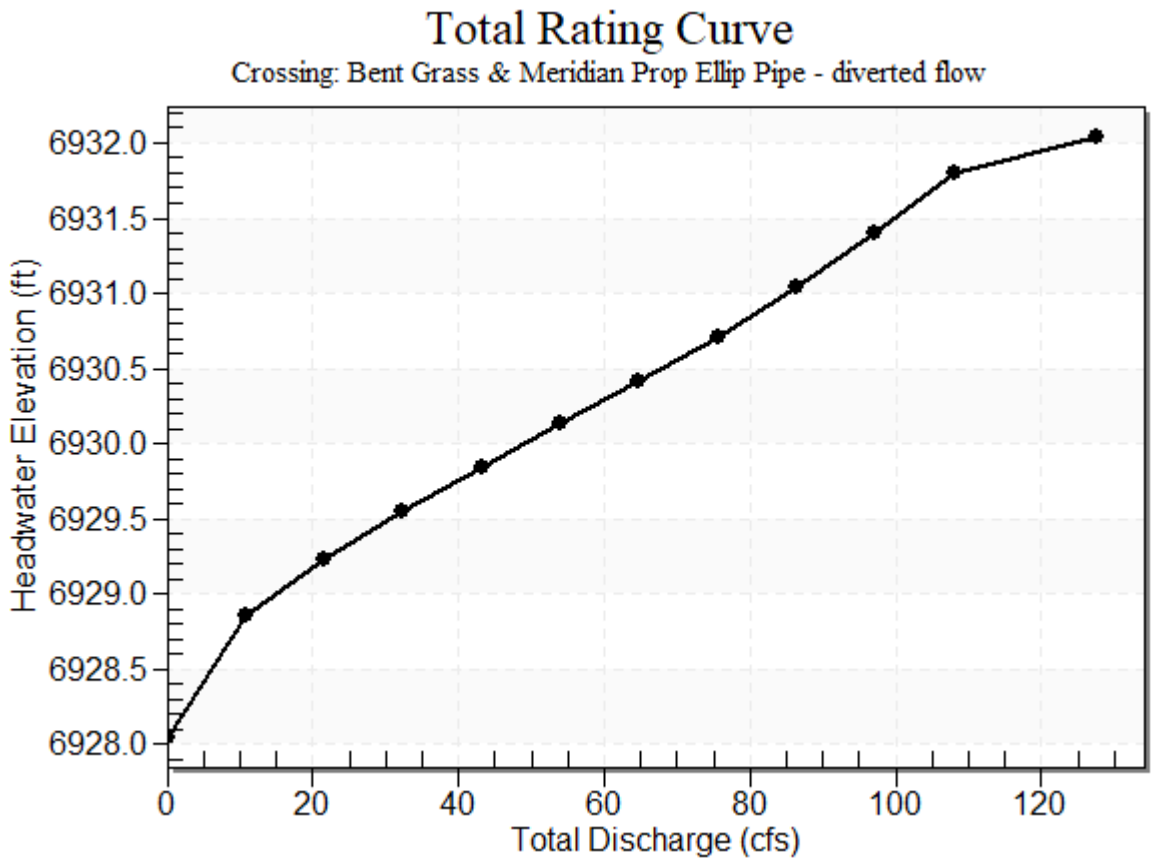


Table 2 - Culvert Summary Table: Proposed Ellip Culverts - BG

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	6928.05	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.80	10.80	6928.86	0.806	0.053	1-S2n	0.521	0.595	0.521	0.302	4.491	1.022
21.60	21.60	6929.22	1.174	0.367	1-S2n	0.737	0.856	0.737	0.456	5.592	1.330
32.40	32.40	6929.55	1.501	0.663	1-S2n	0.910	1.064	0.910	0.580	6.345	1.548
43.20	43.20	6929.85	1.797	0.959	1-S2n	1.064	1.236	1.073	0.688	6.852	1.721
54.00	54.00	6930.13	2.080	1.276	1-S2n	1.202	1.394	1.214	0.784	7.288	1.867
64.80	64.80	6930.41	2.364	1.614	1-S2n	1.329	1.537	1.342	0.873	7.703	1.994
75.60	75.60	6930.71	2.664	1.976	5-S2n	1.460	1.669	1.474	0.955	8.039	2.106
86.40	86.40	6931.04	2.988	2.362	5-S2n	1.592	1.790	1.606	1.033	8.322	2.209
97.20	97.20	6931.40	3.346	3.031	5-S2n	1.729	1.900	1.741	1.106	8.568	2.302
108.00	108.00	6931.79	3.743	3.416	5-S2n	1.879	1.998	1.886	1.176	8.757	2.388

****

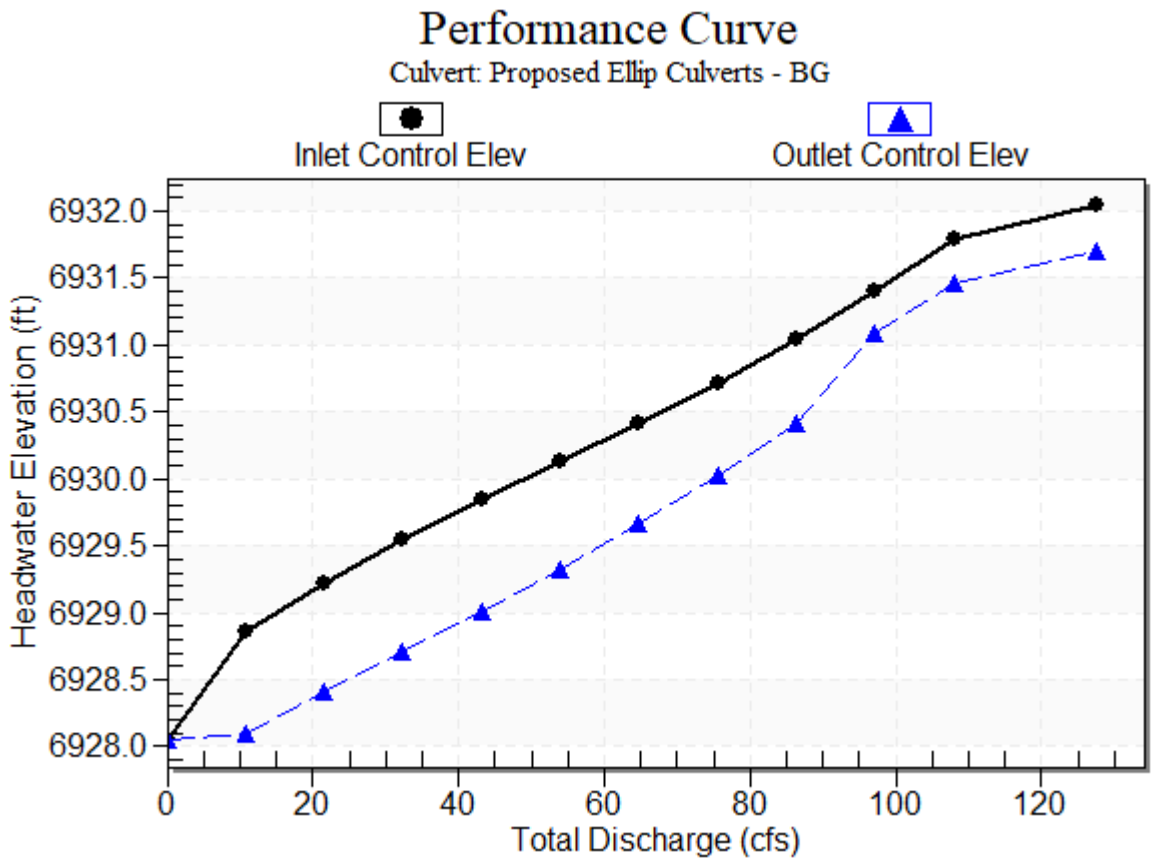
Straight Culvert

Inlet Elevation (invert): 6928.05 ft, Outlet Elevation (invert): 6927.49 ft

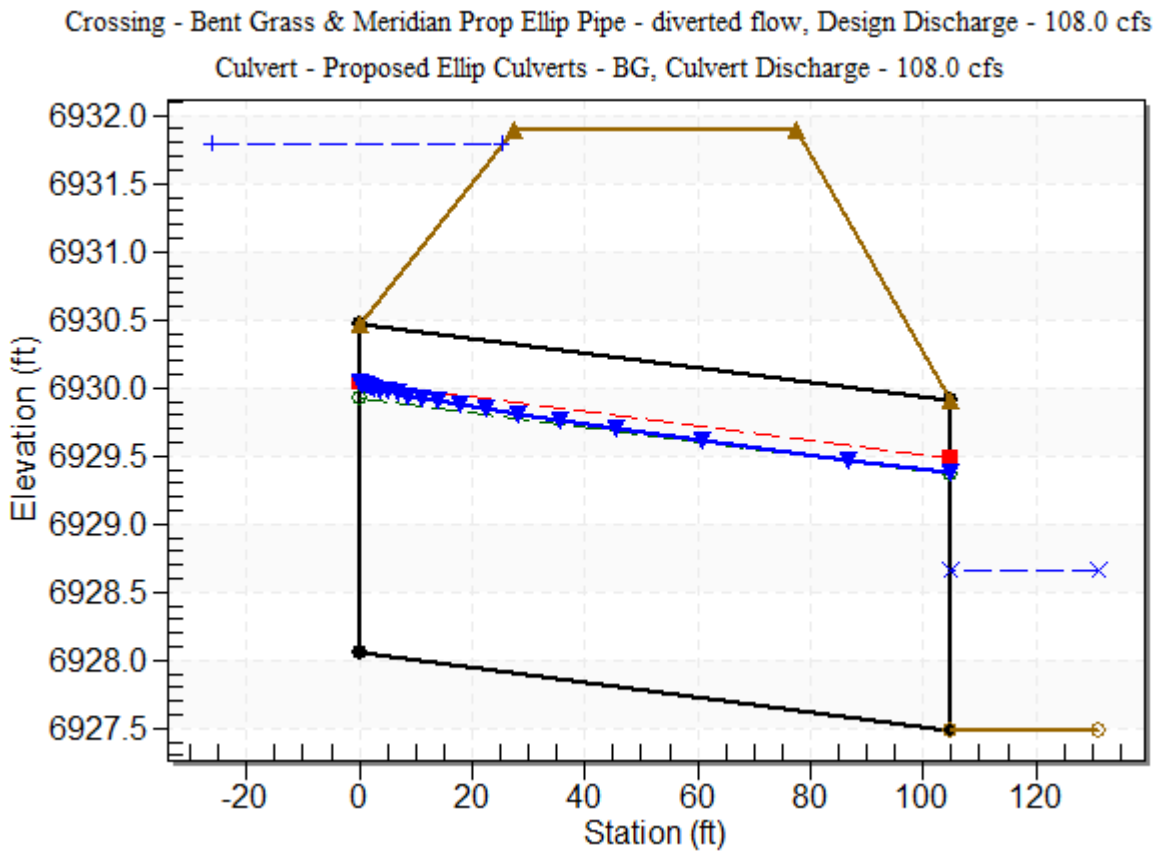
Culvert Length: 105.00 ft, Culvert Slope: 0.0053

****

Culvert Performance Curve Plot: Proposed Ellip Culverts - BG



Water Surface Profile Plot for Culvert: Proposed Ellip Culverts - BG



Site Data - Proposed Ellip Culverts - BG

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 6928.05 ft

Outlet Station: 105.00 ft

Outlet Elevation: 6927.49 ft

Number of Barrels: 2

Culvert Data Summary - Proposed Ellip Culverts - BG

Barrel Shape: Elliptical

Barrel Span: 45.00 in

Barrel Rise: 29.00 in

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Bent Grass & Meridian Prop

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	6927.49	0.00	0.00	0.00	0.00
10.80	6927.79	0.30	1.02	0.06	0.33
21.60	6927.95	0.46	1.33	0.09	0.36
32.40	6928.07	0.58	1.55	0.11	0.37
43.20	6928.18	0.69	1.72	0.13	0.38
54.00	6928.27	0.78	1.87	0.15	0.39
64.80	6928.36	0.87	1.99	0.16	0.39
75.60	6928.45	0.96	2.11	0.18	0.40
86.40	6928.52	1.03	2.21	0.19	0.40
97.20	6928.60	1.11	2.30	0.21	0.41
108.00	6928.67	1.18	2.39	0.22	0.41

Tailwater Channel Data - Bent Grass & Meridian Prop Ellip Pipe - diverted flow

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 33.75 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0030

Channel Manning's n: 0.0350

Channel Invert Elevation: 6927.49 ft

Roadway Data for Crossing: Bent Grass & Meridian Prop Ellip Pipe - diverted flow

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 6931.90 ft

Roadway Surface: Paved

Roadway Top Width: 50.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 1010 cfs

Maximum Flow: 1010 cfs

Table 1 - Summary of Culvert Flows at Crossing: Bent Grass & Meridian Diverted

Headwater Elevation (ft)	Total Discharge (cfs)	Proposed Culvert-Diverted Flow Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6925.11	0.00	0.00	0.00	1
6927.00	101.00	101.00	0.00	1
6927.70	202.00	202.00	0.00	1
6928.24	303.00	303.00	0.00	1
6928.69	404.00	404.00	0.00	1
6929.10	505.00	505.00	0.00	1
6929.52	606.00	606.00	0.00	1
6929.98	707.00	707.00	0.00	1
6930.44	808.00	808.00	0.00	1
6930.92	909.00	909.00	0.00	1
6931.42	1010.00	1010.00	0.00	1
6931.50	1026.44	1026.44	0.00	Overtopping

Rating Curve Plot for Crossing: Bent Grass & Meridian Diverted Flow Ex Channel

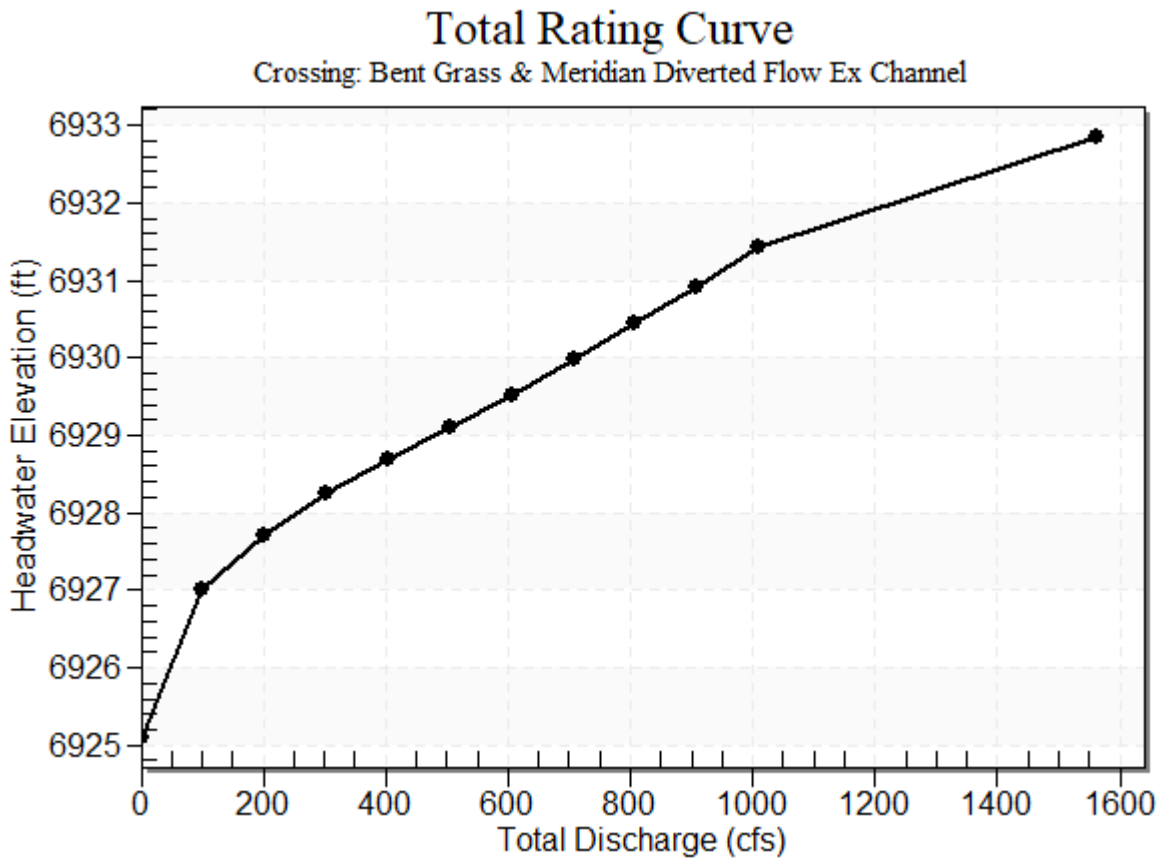


Table 2 - Culvert Summary Table: Proposed Culvert-Diverted Flow

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	6925.11	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
101.00	101.00	6927.00	1.037	1.889	3-M1t	0.687	0.676	2.105	2.105	1.499	5.696
202.00	202.00	6927.70	1.646	2.593	1-S1t	1.060	1.074	2.730	2.730	2.312	6.774
303.00	303.00	6928.24	2.162	3.128	1-S1t	1.371	1.407	3.179	3.179	2.979	7.496
404.00	404.00	6928.69	2.628	3.584	1-S1t	1.648	1.704	3.541	3.541	3.565	8.055
505.00	505.00	6929.10	3.052	3.991	1-S1t	1.904	1.978	3.850	3.850	4.099	8.518
606.00	606.00	6929.52	3.453	4.410	1-S1f	2.145	2.233	4.000	4.122	4.734	8.915
707.00	707.00	6929.98	3.848	4.869	4-FFf	2.374	2.475	4.000	4.368	5.523	9.265
808.00	808.00	6930.44	4.250	5.332	4-FFf	2.594	2.705	4.000	4.592	6.313	9.580
909.00	909.00	6930.92	4.671	5.811	4-FFf	2.806	2.926	4.000	4.799	7.102	9.866
1010.00	1010.00	6931.42	5.120	6.307	4-FFf	3.012	3.139	4.000	4.993	7.891	10.129

****

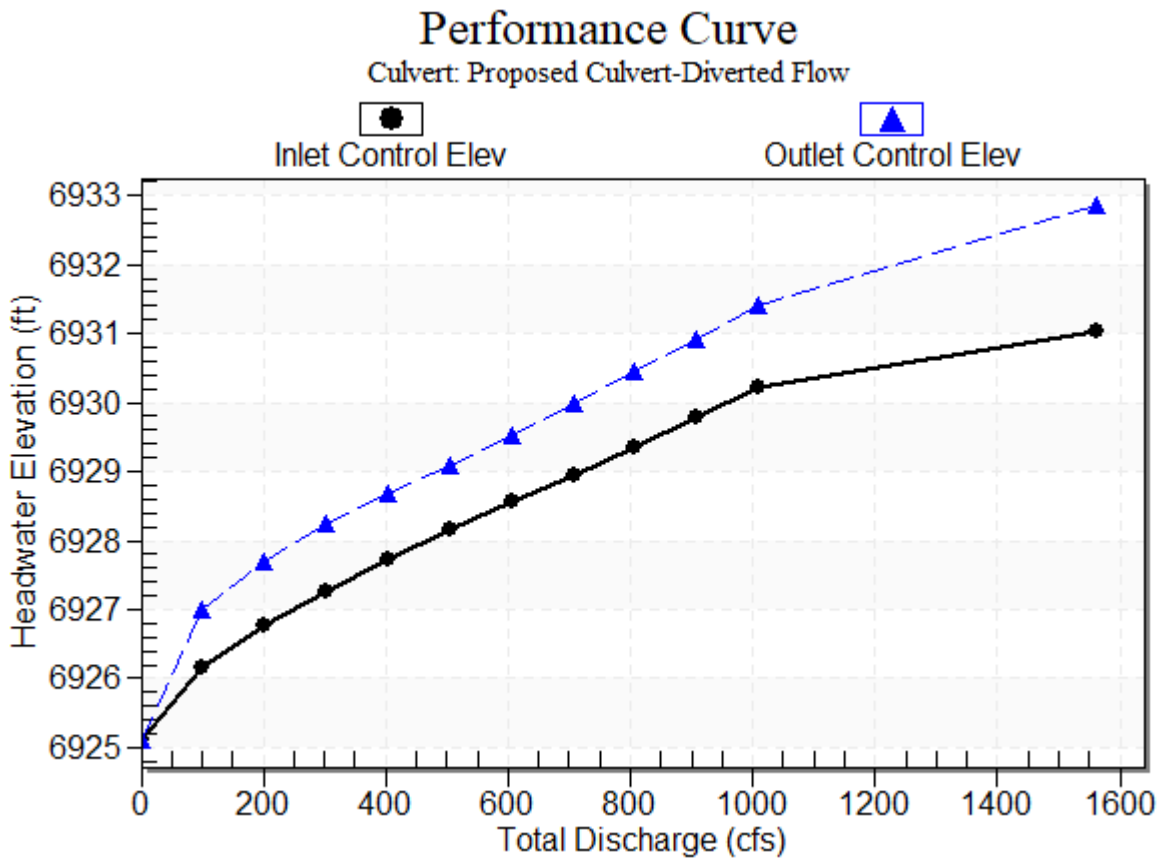
Straight Culvert

Inlet Elevation (invert): 6925.11 ft, Outlet Elevation (invert): 6924.83 ft

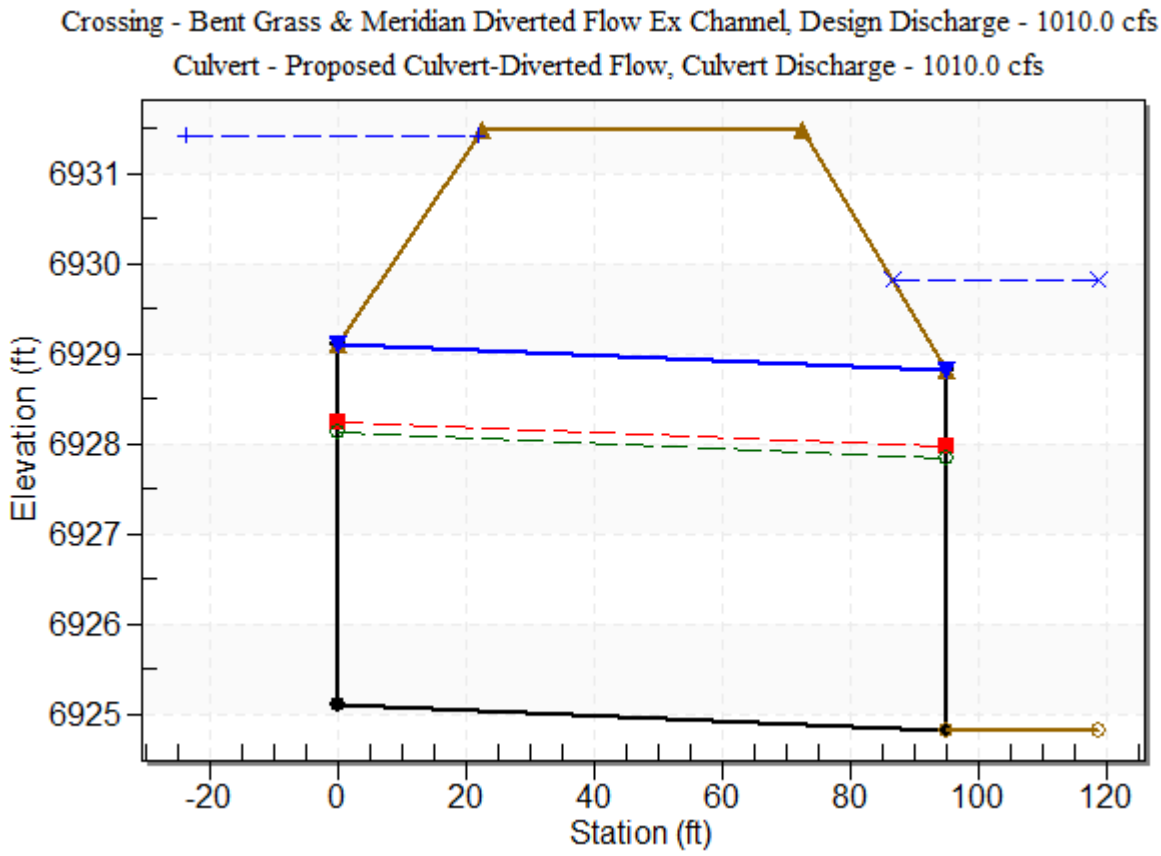
Culvert Length: 95.00 ft, Culvert Slope: 0.0029

****

Culvert Performance Curve Plot: Proposed Culvert-Diverted Flow



Water Surface Profile Plot for Culvert: Proposed Culvert-Diverted Flow



Site Data - Proposed Culvert-Diverted Flow

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 6925.11 ft

Outlet Station: 95.00 ft

Outlet Elevation: 6924.83 ft

Number of Barrels: 2

Culvert Data Summary - Proposed Culvert-Diverted Flow

Barrel Shape: Concrete Box

Barrel Span: 16.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge (30-75º flare) Wingwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Bent Grass & Meridian

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	6924.83	0.00	0.00	0.00	0.00
101.00	6926.94	2.11	5.70	2.30	0.98
202.00	6927.56	2.73	6.77	2.98	1.02
303.00	6928.01	3.18	7.50	3.47	1.05
404.00	6928.37	3.54	8.06	3.87	1.07
505.00	6928.68	3.85	8.52	4.20	1.08
606.00	6928.95	4.12	8.91	4.50	1.09
707.00	6929.20	4.37	9.26	4.77	1.10
808.00	6929.42	4.59	9.58	5.01	1.11
909.00	6929.63	4.80	9.87	5.24	1.12
1010.00	6929.82	4.99	10.13	5.45	1.13

Tailwater Channel Data - Bent Grass & Meridian Diverted Flow Ex Channel

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0175

Channel Manning's n: 0.0350

Channel Invert Elevation: 6924.83 ft

Roadway Data for Crossing: Bent Grass & Meridian Diverted Flow Ex Channel

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 6931.50 ft

Roadway Surface: Paved

Roadway Top Width: 50.00 ft

FINAL DRAINAGE AND EROSION CONTROL

FOR

THE MEADOWS FILING THREE SUBDIVISION

JULY 2000

PROJECT NO. 9820

LADD ENGINEERING **CONSULTING ENGINEERS**
LAND SURVEYOR
1975 SPRING VALLEY DRIVE
COLORADO SPRINGS, CO 80921
(719)481-6320, (719)481-6328 FAX
fredladd@worldnet.att.net

The Meadows Filing Three

Capital Pacific Homes of Colorado, Inc.

July 2000

ENGINEER'S STATEMENT

The attached drainage plan and report was prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Fred C. Ladd, PE-PLS

Se

FRED C. LADD REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR 9132 07/28/00 STATE OF COLORADO

DEVELOPER'S STATEMENT

I, Everett Pfeiff, Agent for Capital Pacific Homes of Colorado, Inc. the Developer, have read and will comply with all the requirements specified in the drainage report and plan.

The Meadows Filing Three
Capital Pacific Homes of Colorado, Inc.

By: _____
Everett Pfeiff, Agent

Address: 1333 W. 120th Avenue, Suite 222
Westminster, CO 80234

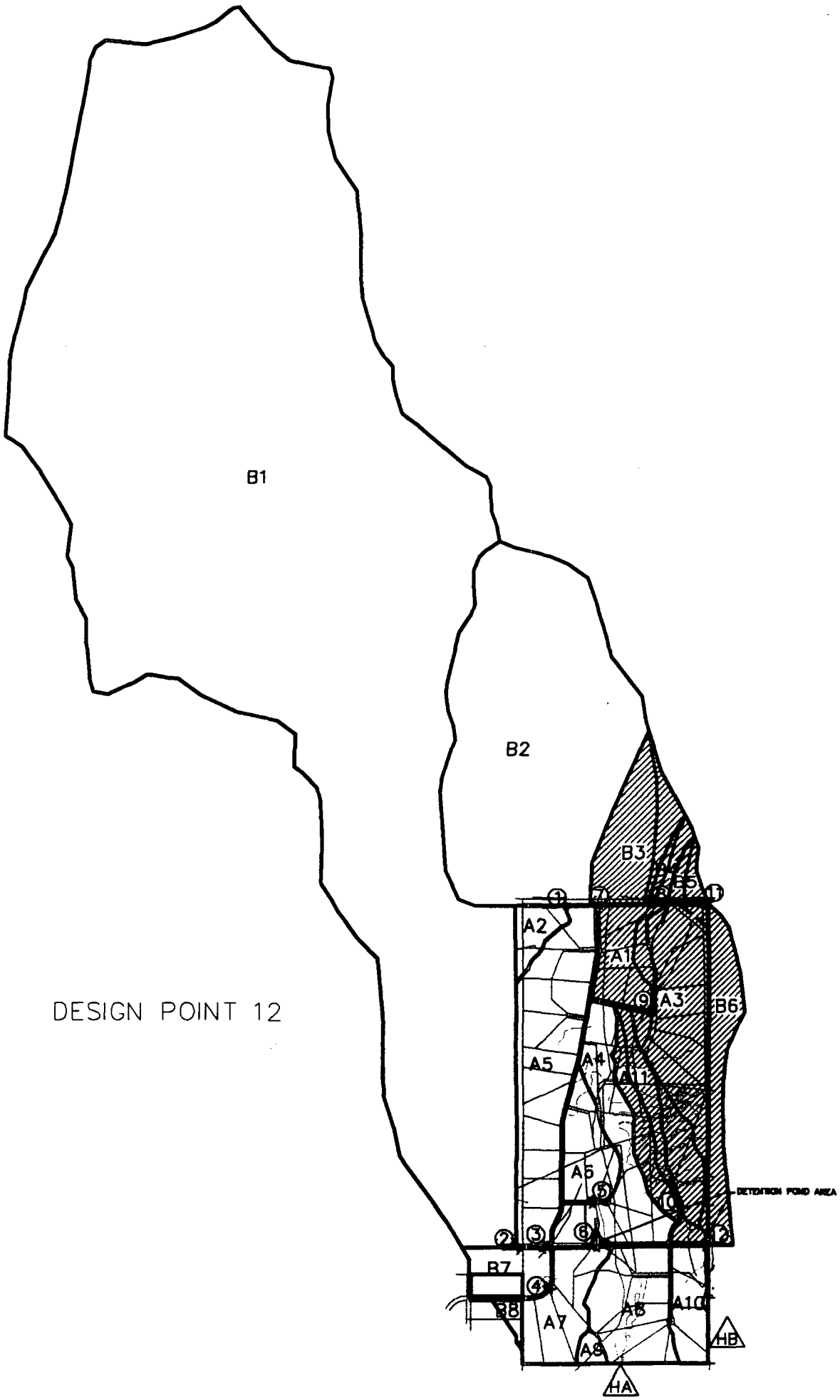
EL PASO COUNTY ONLY

Filed in accordance of section 51.1 of the El Paso Land Development Code, as amended.

John A. McCarty, P.E.-County Engineer

5-15-00
Date

Conditions:


B1
B2
B3
B5
B6
B7
B8
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
DESIGN POINT 12
DETENTION POND AREA
HA
HB

DESIGN POINT #12.

THE RUNOFF FOR THIS POINT WAS ORIGINALLY CALCULATED USING THE SCS UNIT HYDROGRAPH METHOD. BECAUSE OF THE SOILS TYPE AND LENGTH OF THE BASIN THE QUANTITY OF FLOWS CALCULATED WERE VERY SMALL, (LESS THAN 10 CFS). TO GENERATE A MORE CONSERVATIVE QUANTITY AND A RESULTING, LARGER CULVERT DIAMETER, THE RATIONAL METHOD IS BEING USED TO CALCULATE FLOWS FOR THIS BASIN.

DESIGN POINT #12

BASINS B3, B4, B5, B6, A1, A3 & A11

AREA = 42.48 + 7.13 + 7.52 + 33.84 + 27.21 + 79.22 + 27.65 = 225.05 ACRES

COEFFICIENT OF RUNOFF

B3, B4 & B5

$C_{10} = 0.25$

$C_{100} = 0.35$

B6

WOODMAN HILLS SUBDIVISION
ASSUMED 1-ACRE PARCELS

$C_{10} = 0.3$

$C_{100} = 0.4$

A1, A3 & A11

SOILS TYPE A
LAND USE IS 5-ACRE AND LARGER PARCELS
ASSUME 50% 1-ACRE PARCELS AND 50% PASTURE/MEADOW

$C_{10} = 0.5(0.3) + 0.5(0.25) = 0.275$

$C_{100} = 0.5(0.4) + 0.5(0.35) = 0.375$

COMPOSITE

$$C_{10} = \frac{0.25(42.48+7.13+7.52) + 0.3(33.84) + 0.275(27.21+79.22+27.65)}{225.05}$$

$C_{10} = 0.272$

$$C_{100} = \frac{0.35(42.48+7.13+7.52) + 0.4(33.84) + 0.375(27.21+79.22+27.65)}{225.05}$$

$C_{100} = 0.372$

DESIGN POINT #12

TIME OF CONCENTRATION

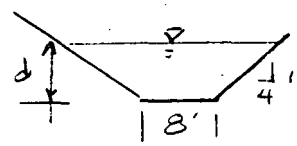
$T_i = 52.3$ MIN (SEE DESIGN POINT #9)

$$T_T = \frac{L}{60V}$$

$L = 3725$ FT

$$V = \frac{1.49}{n}(R)^{2/3}(S)^{1/2}$$

$n = 0.03$



$a = bd + zd^2$

$$R = \frac{bd + zd^2}{b + 2d\sqrt{z^2+1}}$$

$$R = \frac{8(1) + 4(1)^2}{8 + 2(1)\sqrt{4^2+1}} = 0.739$$

$$S = \frac{7096 - 7000}{3725} = 0.026$$

$$V = \frac{1.49}{0.03}(0.739)^{2/3}(0.026)^{1/2} = 6.55 \text{ FT/S}$$

$$T_T = \frac{3725}{60(6.55)} = 9.5 \text{ MIN}$$

$T_c = 52.3 + 9.5 = 61.8$ MIN

DESIGN POINT #12

RAINFALL INTENSITY

$I_5 = 1.5$
$I_{100} = 2.7$ } FIG 5-1 DRAINAGE CRITERIA MANUAL

$Q_5 = 0.272(1.5)(225.05) = 91.8$ CFS

$Q_{100} = 0.372(2.7)(225.05) = 226.0$ CFS

NEW DOC

CDR-15-006

FINAL DRAINAGE REPORT ADDENDUM FOR BENT GRASS RESIDENTIAL (FILING NO. 1)

AUGUST 2015

Prepared for:
RIVERS DEVELOPMENT, INC.
13530 NORTHGATE ESTATES DR., SUITE 200
COLORADO SPRINGS, CO 80921
Contact: Roger Miller

Prepared by:
CLASSIC CONSULTING ENGINEERS & SURVEYORS, LLC
6385 CORPORATE DRIVE, SUITE 101
COLORADO SPRINGS, CO 80919
(719) 785-0790

Job no. 2430.00

CLASSIC CONSULTING ENGINEERS & SURVEYORS

FINAL DRAINAGE REPORT ADDENDUM
FOR BENT GRASS RESIDENTIAL (FILING NO. 1)

DRAINAGE REPORT STATEMENT

ENGINEER'S STATEMENT:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the Drainage Criteria Manual for the City of Colorado Springs and El Paso County. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

COLORADO REGISTERED MARC ALAN WHORTON 37155 PROFESSIONAL ENGINEER

Marc A. Whorton, Colorado P.E. #33155 — Date: 11/6/15

DEVELOPER'S STATEMENT:

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: Rivers Development, Inc.

11/9/15

Title: Director of Engineering

Address: 13530 Northgate Estates Dr., Suite 200

Colorado Springs, CO 80921

EL PASO COUNTY:

Filed in accordance with Section 51.1 of the El Paso Land Development Code, as amended.

For El Paso County Engineer/Director — Date: 11-18-15

Conditions:

CLASSIC CONSULTING ENGINEERS & SURVEYORS

Sediment Pond Spillway

Project Description

Solve For	Discharge

Input Data

Headwater Elevation	6957.60	ft
Crest Elevation	6957.00	ft
Weir Coefficient	3.00	US
Crest Length	30.00	ft

Results

Discharge	41.83	ft^3/s
Headwater Height Above Crest	0.60	ft
Flow Area	18.00	ft^2
Velocity	2.32	ft/s
Wetted Perimeter	31.20	ft
Top Width	30.00	ft

Subsection: Elevation-Area Volume Curve
Label: SEDIMENT BASIN

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Elevation (ft)	Planimeter (ft^2)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
6,954.00	0.0	0.310	0.000	0.000	0.000
6,956.00	0.0	0.410	1.077	0.718	0.718
6,958.00	0.0	1.340	2.491	1.661	2.378

Subsection: Outlet Input Data
Label: SEDIMENT BASIN

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	6,953.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	6,957.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Stand Pipe	Riser - 1	Forward	TW	6,957.00	6,958.00
Orifice-Area	Orifice - 1	Forward	TW	6,955.25	6,958.00
Rectangular Weir	Weir - 1	Forward	TW	6,957.00	6,958.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	6,957.00 ft
Weir Length	35.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	6,957.00 ft
Diameter	8.0 in
Orifice Area	0.3 ft²
Orifice Coefficient	0.600
Weir Length	2.09 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice - 1 Structure Type: Orifice-Area	
Number of Openings	5
Elevation	6,955.25 ft
Orifice Area	0.0 ft²
Top Elevation	6,956.92 ft
Datum Elevation	6,955.25 ft
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft

Convergence Tolerances	
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

Subsection: Elevation-Volume-Flow Table (Pond)
Label: SEDIMENT BASIN

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	6,954.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
6,954.00	0.00	0.000	0.310	0.00	0.00	0.00
6,954.50	0.00	0.161	0.334	0.00	0.00	77.87
6,955.00	0.00	0.334	0.358	0.00	0.00	161.58
6,955.25	0.00	0.425	0.371	0.00	0.00	205.69
6,955.50	0.06	0.519	0.384	0.00	0.06	251.39
6,956.00	0.17	0.718	0.410	0.00	0.17	347.53
6,956.50	0.29	0.967	0.592	0.00	0.29	468.25
6,957.00	0.39	1.316	0.808	0.00	0.39	637.13
6,957.50	38.76	1.781	1.057	0.00	38.76	900.54
6,958.00	107.17	2.378	1.340	0.00	107.17	1,258.36

Needs more storage and inflow data.

THIS IS AN EXCERPT FROM A PREVIOUSLY APPROVED REPORT

Subsection: Pond Inflow Summary
Label: SEDIMENT BASIN (IN)

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Summary for Hydrograph Addition at 'SEDIMENT BASIN'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	H-2
MID POND OUTLET	MID POND

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	H-2	0.674	6.200	5.11
Flow (From)	MID POND OUTLET	4.452	9.700	6.25
Flow (In)	SEDIMENT BASIN	5.126	9.700	6.66

I don't think these calculations are valid or useful.

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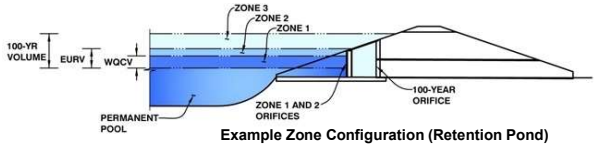
Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Meridian Road

Basin ID: Proposed Pond (Diverted Flow)



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (100-year)		13.612	Weir&Pipe (Circular)
Zone 2			
Zone 3			
		13.612	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =		ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =		ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =		inches
Orifice Plate: Orifice Area per Row =		inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 1 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	1.25		ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	2.09		feet
Overflow Weir Slope =	0.00		H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	2.09		feet
Overflow Grate Open Area % =	70%		%, grate open area/total area
Debris Clogging % =	50%		%

Calculated Parameters for Overflow Weir

	Zone 1 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	1.25		feet
Over Flow Weir Slope Length =	2.09		feet
Grate Open Area / 100-yr Orifice Area =	8.76		should be $\geq$ 4
Overflow Grate Open Area w/o Debris =	3.06		ft^2
Overflow Grate Open Area w/ Debris =	1.53		ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 1 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	1.25		ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	8.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 1 Circular	Not Selected	
Outlet Orifice Area =	0.35		ft^2
Outlet Orifice Centroid =	0.33		feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	3.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	30.00	feet
Spillway End Slopes =	0.17	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	1.64	feet
Stage at Top of Freeboard =	5.64	feet
Basin Area at Top of Freeboard =	1.34	acres

Routed Hydrograph Results

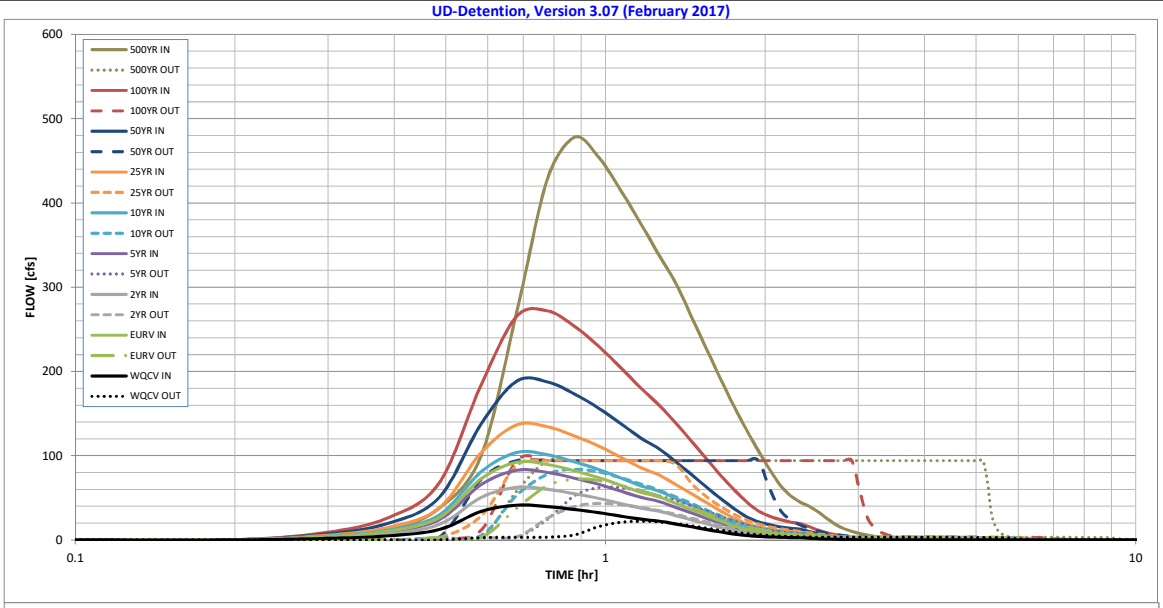
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.67	3.68
Calculated Runoff Volume (acre-ft) =	2.957	6.712	4.497	6.003	7.583	10.059	14.043	20.608	37.727
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	2.954	6.707	4.493	5.998	7.575	10.051	14.031	20.589	37.692
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.00	0.00	0.01	0.02	0.16	0.41	1.04
Predevelopment Peak Q (cfs) =	0.0	0.0	0.1	1.0	2.3	5.2	38.7	99.9	254.1
Peak Inflow Q (cfs) =	41.3	92.2	62.3	82.7	103.8	136.6	188.3	271.9	478.1
Peak Outflow Q (cfs) =	22.2	72.1	43.2	62.1	83.8	94.1	94.1	94.1	94.1
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	61.9	36.0	18.0	2.4	0.9	0.4
Structure Controlling Flow =	Spillway	Spillway	Spillway	Spillway	Spillway	N/A	N/A	N/A	N/A
Max Velocity through Grate 1 (fps) =	1.14	1.20	1.17	1.2	1.2	1.2	1.2	1.2	1.2
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	>120	>120	>120	>120	>120	>120	>120	6	6
Time to Drain 99% of Inflow Volume (hours) =	**>120**	>120	>120	>120	>120	>120	>120	>120	>120
Maximum Ponding Depth (ft) =	3.35	3.83	3.58	3.75	3.92	4.00	4.00	4.00	4.00
Area at Maximum Ponding Depth (acres) =	0.98	1.24	1.10	1.19	1.29	1.34	1.34	1.34	1.34
Maximum Volume Stored (acre-ft) =	1.632	2.164	1.860	2.055	2.279	2.384	2.384	2.384	2.384

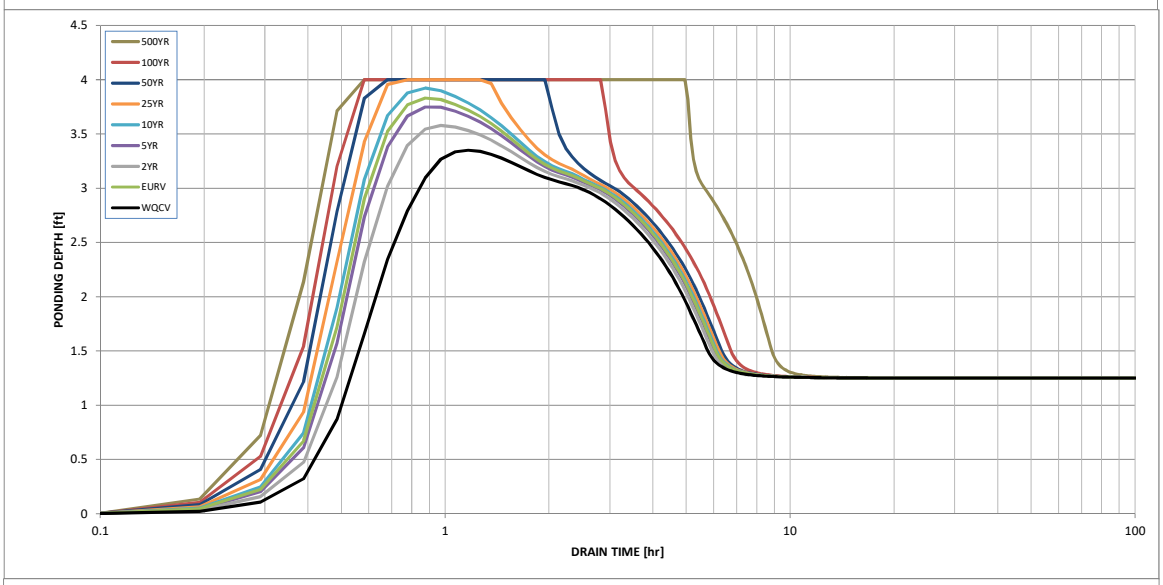
SPREADSHEET UPDATED

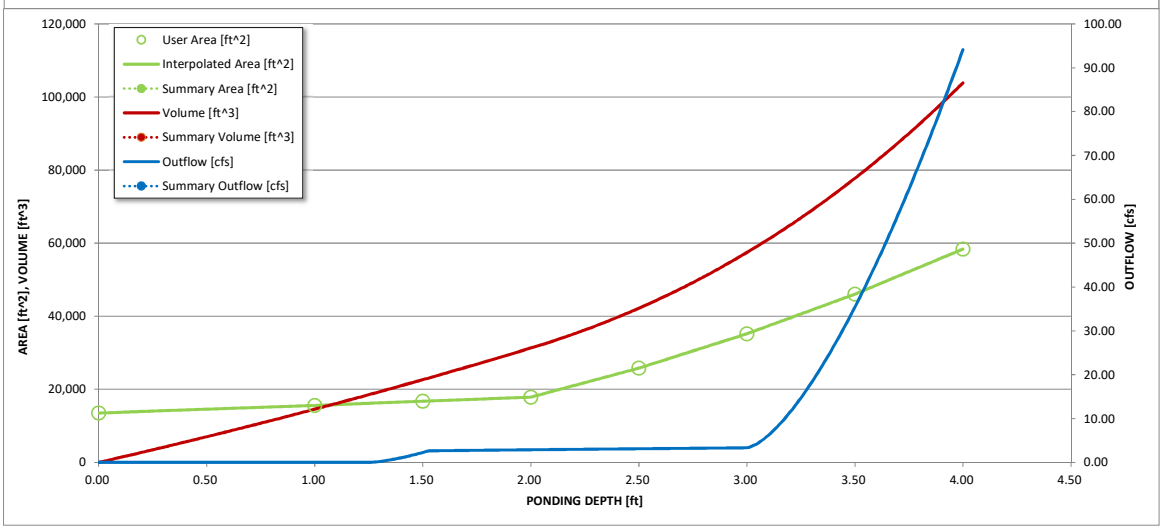
Something is wrong with calculations (pond volume)

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)







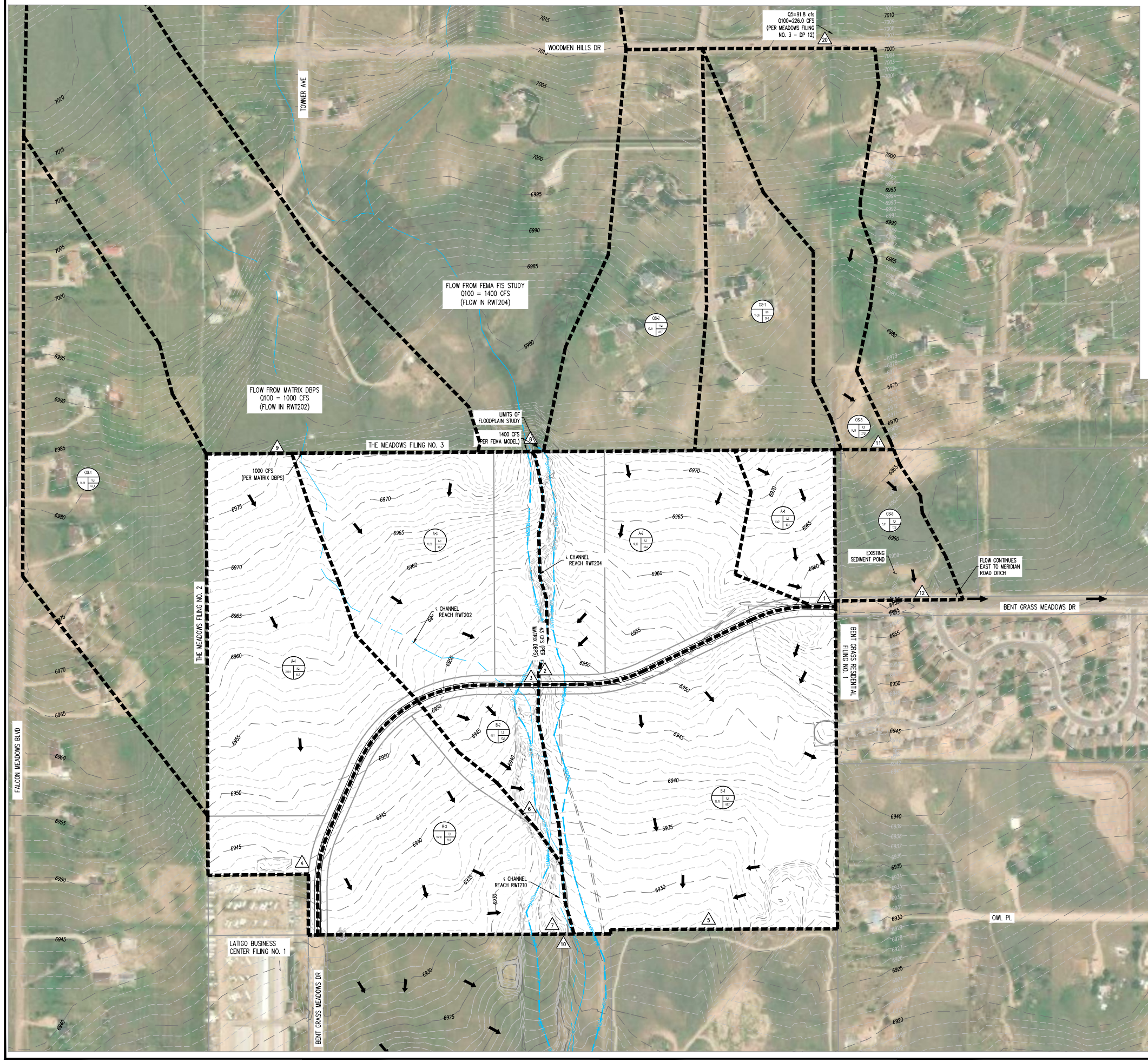
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

APPENDIX D

Drainage Maps

Please rotate clockwise

ROTATED



DESIGN POINT SUMMARY TABLE

Design Point	Q_5 (cfs)	Q_{100} (cfs)
1	8.9	39.4
2	16.5	75.9
3	11.4	63.5
4	19.2	95.9
5	9.6	64.2
6	1.5	10.0
7	7.8	36.9
8	4.0	43.0
9	0.0	770.0
10	14.0	880.0
20	98.1	226.0
11	103.0	253.8
12	104.8	266.6

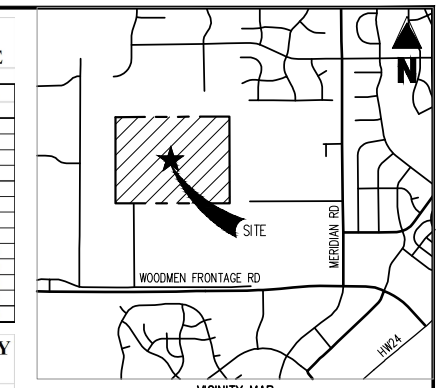
RUNOFF SUMMARY TABLE

Basin ID	Q_5 (cfs)	Q_{100} (cfs)
A-1	2.2	12.4
A-2	5.3	35.4
A-3	6.0	40.7
A-4	8.3	46.5
B-1	9.6	64.2
B-2	1.5	10.0
B-3	7.8	36.9
OS-1	6.9	28.6
OS-2	11.4	41.7
OS-4	12.0	55.4
OS-5	4.9	27.8
OS-6	1.9	12.8

N

0 50 100 200

SCALE: 1"=200'



DRAINAGE LEGEND

- PROPERTY LINE
- 6485 EXISTING MAJOR CONTOUR
- 6483 EXISTING MINOR CONTOUR
- BASIN BOUNDARY LINE
- 100YR FEMA EFFECTIVE 100-YR FLOODPLAIN
- CENTERLINE OF STREAM
- BASIN DESIGNATION
- 5-YEAR RUNOFF IN CUBIC FEET PER SECOND
- 100-YEAR RUNOFF IN CUBIC FEET PER SECOND
- BASIN AREA IN ACRES
- DIRECTION OF RUNOFF

Galloway

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CHALLENGER HOMES

DRAINAGE PLAN
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO - EL PASO COUNTY

#	Date	Issue / Description	Init.
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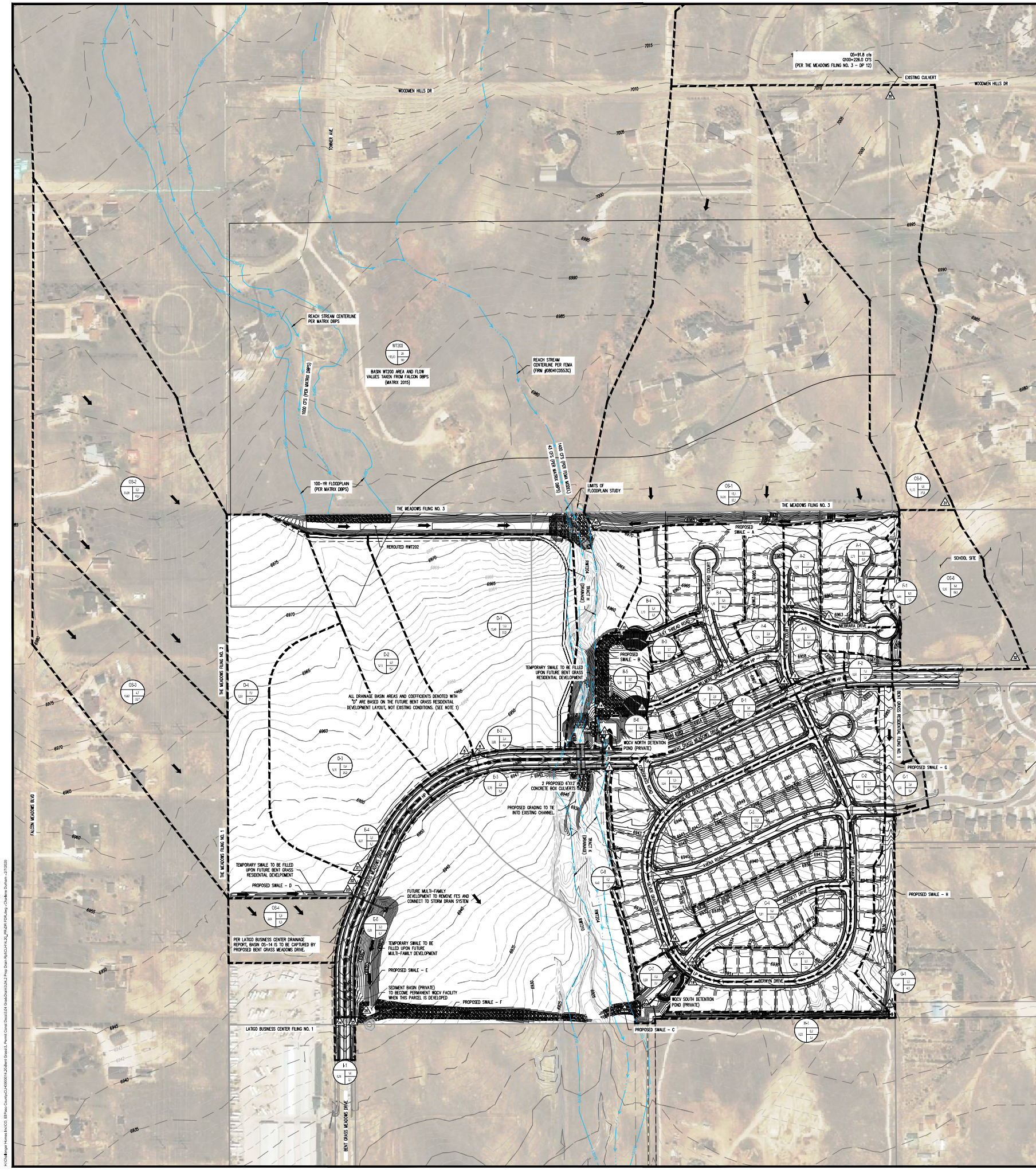
Project No:	CLH000014.20
Drawn By:	CMWJ
Checked By:	SMB
Date:	OCTOBER 2019

EXISTING DRAINAGE MAP

DR-1

Sheet 1 of 3



PIPE AND INLET SUMMARY TABLE

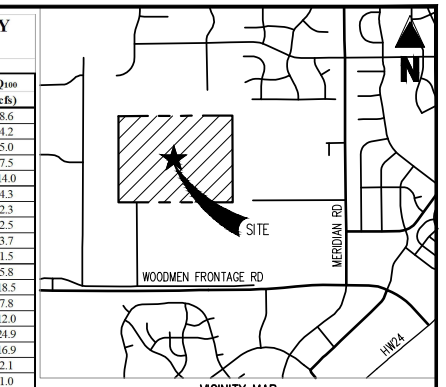
Design Point	Qs (cfs)	Q100 (cfs)
5 Inlet	5.8	15.6
6 Inlet	12.9	19.5
6 Pipe	18.5	35.1
7 Inlet	2.9	21.6
8 Inlet	11.6	21.6
8 Pipe	29.0	72.8
16 Inlet	9.8	15.5
16 Pipe	9.8	15.5
17 Inlet	5.8	9.2
17 Pipe	15.6	24.6
18 Inlet	9.0	27.4
18 Pipe	9.0	27.4
19 Inlet	9.9	29.6
19 Pipe	18.5	55.7
21 Inlet	9.4	23.1
21 Pipe	9.4	23.1
22 Inlet	12.3	23.1
22 Pipe	19.0	46.2
23 Inlet	4.4	21.2
23 Pipe	22.7	63.7
24 Inlet	2.3	17.0
24 Pipe	2.3	17.0
25 Inlet	3.3	17.0
25 Pipe	4.0	34.0

DESIGN POINT SUMMARY TABLE

Design Point	Qs (cfs)	Q100 (cfs)
1	3.3	8.6
2	4.5	11.9
3	6.1	15.9
4	8.6	22.4
5	5.8	25.2
6	13.3	25.2
7	2.9	21.6
8	11.6	21.6
9	1.1	2.3
10	1.1	4.1
11	5.6	14.0
12	2.0	4.3
13	15.6	18.0
14	8.7	24.6
15	36.4	94.3
15A	12.2	37.0
16	10.9	24.9
17	7.0	16.9
18	9.0	27.4
19	9.9	29.6
19A	32.9	78.6
20	1.3	4.5
20A	34.1	83.6
20B	21.3	66.0
21	9.4	35.2
22	12.5	35.2
23	4.4	21.2
24	2.3	17.1
25	4.0	17.1
26	25.5	91.4
30	98.1	226.0
31	103.0	253.5
32	111.8	272.8
40	15.1	65.1

RUNOFF SUMMARY TABLE

Basin ID	Area (acres)	Qs (cfs)	Q100 (cfs)
A-1	2.70	3.3	8.6
A-2	1.19	1.5	4.2
A-3	1.57	2.1	5.0
A-4	2.24	2.9	7.5
B-1	4.46	5.6	14.0
B-2	1.17	2.0	4.3
B-3	0.46	1.1	2.3
B-4	1.19	0.4	2.5
B-5	1.56	0.5	3.7
B-6	0.62	0.2	1.5
C-1	1.35	2.6	5.8
C-2	6.80	7.1	18.5
C-3	2.38	3.3	7.8
C-4	3.61	5.3	12.0
C-5	7.86	10.9	24.9
C-6	5.54	7.0	16.9
C-7	0.89	0.3	2.1
C-8	0.42	0.2	1.0
D-1	12.49	13.3	35.5
D-2	5.15	5.8	15.4
D-3	9.16	9.4	26.2
D-4	9.53	7.1	23.3
E-1	1.71	3.6	7.7
E-2	0.68	2.4	4.6
E-3	0.78	2.9	5.3
E-4	0.91	3.0	5.7
E-5	0.89	3.3	6.1
F-1	0.44	0.6	1.6
F-2	0.55	1.5	3.1
G-1	1.47	1.3	4.5
H-1	0.52	0.2	1.4
I-1	0.31	1.0	2.1
OS-1	32.28	15.1	65.1
OS-2	20.08	9.0	43.4
OS-3	10.62	4.7	22.7
OS-4	2.64	0.9	6.0
OS-5	14.13	4.9	27.5
OS-6	5.38	8.8	19.3



VICINITY MAP
SCALE: 1"=1000'

DRAINAGE LEGEND

- PROPERTY LINE
- 6485 — PROPOSED MAJOR CONTOUR
- 6483 — PROPOSED MINOR CONTOUR
- 6485 — EXISTING MAJOR CONTOUR
- 6483 — EXISTING MINOR CONTOUR
- BASIN BOUNDARY LINE
- 100YR — FEMA EFFECTIVE 100-YR FLOODPLAIN
- DBPS — 100-YR FLOODPLAIN PER MATRIX DBPS
- CENTERLINE OF REACH
- BASIN DESIGNATION
- 5-YEAR RUNOFF IN CUBIC FEET PER SECOND
- 100-YEAR RUNOFF IN CUBIC FEET PER SECOND
- BASIN AREA IN ACRES
- DESIGN POINT
- DIRECTION OF RUNOFF

N

0 50 100 200
SCALE: 1"=200'

NOTES

1. SEE "BENT GRASS RESIDENTIAL SUBDIVISION" MDDP DRAINAGE MAPS FOR THE APPROXIMATE FUTURE SITE LAYOUT OF BENT GRASS RESIDENTIAL SUBDIVISION.

Galloway
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CHALLENGER HOMES

DRAINAGE PLAN
BENT GRASS RESIDENTIAL FILING NO. 2
FOR
CHALLENGER COMMUNITIES, LLC

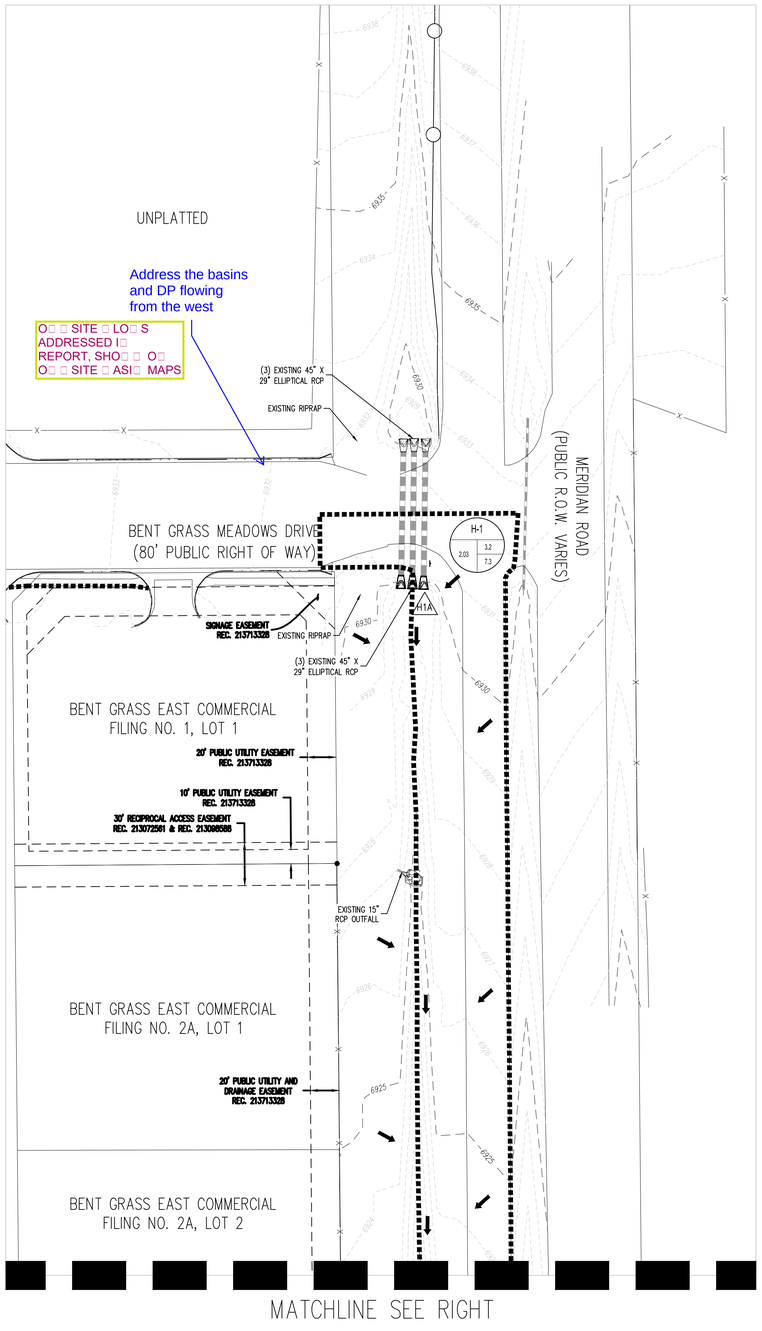
BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO - EL PASO COUNTY

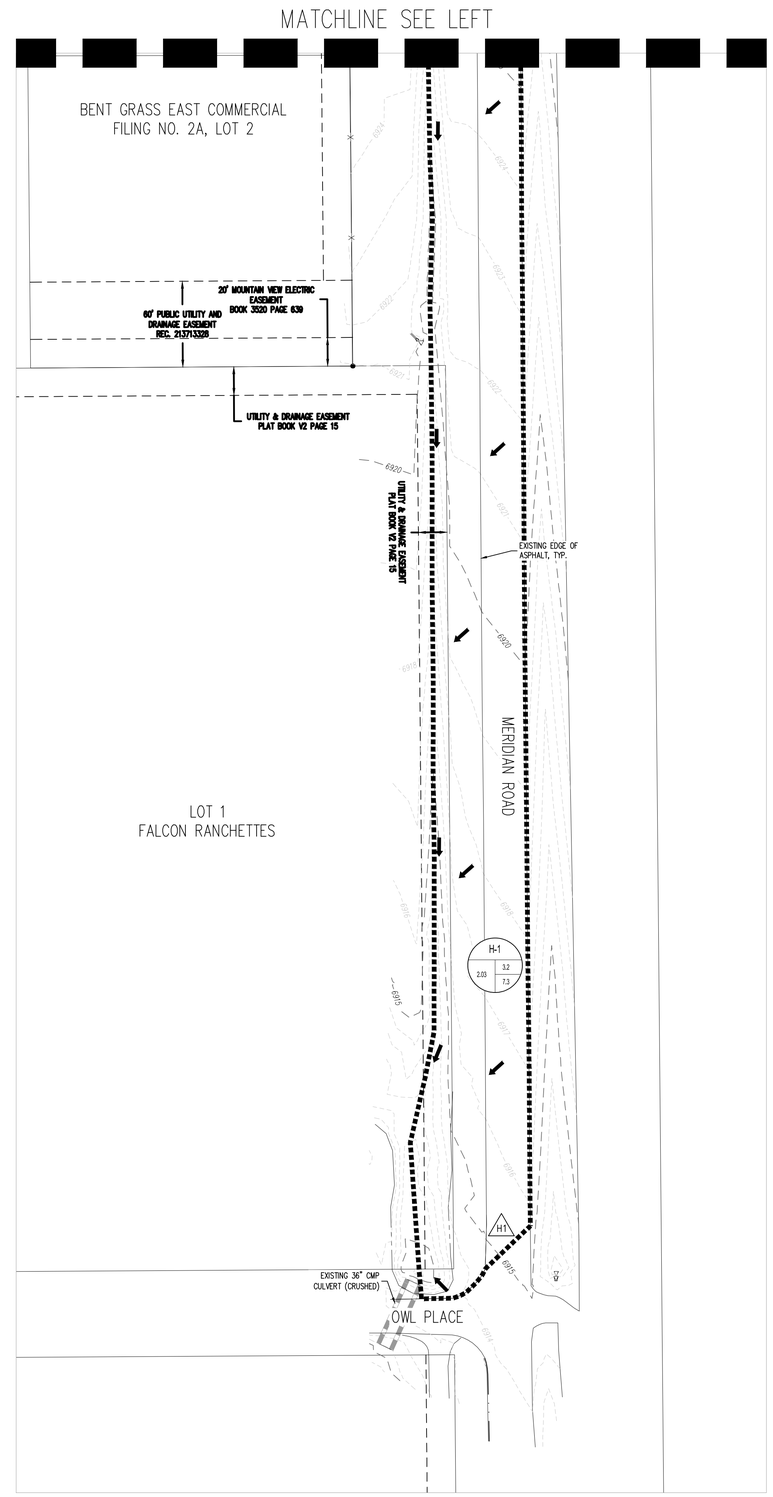
#	Date	Issue / Description	Init.

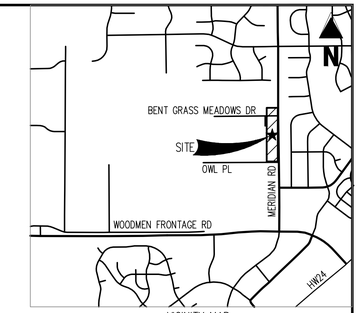
Project No:	CLH000014.20
Drawn By:	CMWJ
Checked By:	SMB
Date:	OCTOBER 2019

OVERALL BASIN PLAN - FDR

DR-2
Sheet 2 of 3







VICINITY MAP

N

0 10 20 50

SCALE: 1"=50'

DRAINAGE LEGEND

- PROPERTY LINE
- 6485 EXISTING MAJOR CONTOUR
- 6483 EXISTING MINOR CONTOUR
- BASIN BOUNDARY LINE
- BASIN DESIGNATION
- 5-YEAR RUNOFF IN CUBIC FEET PER SECOND
- 100-YEAR RUNOFF IN CUBIC FEET PER SECOND
- BASIN AREA IN ACRES
- DESIGN POINT
- DIRECTION OF RUNOFF

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GallowayUS.com

NOT FOR CONSTRUCTION

CHALLENGER HOMES

BENT GRASS MEADOW DRIVE & MERIDIAN ROAD
ROADWAY IMPROVEMENTS
DRAINAGE PLAN

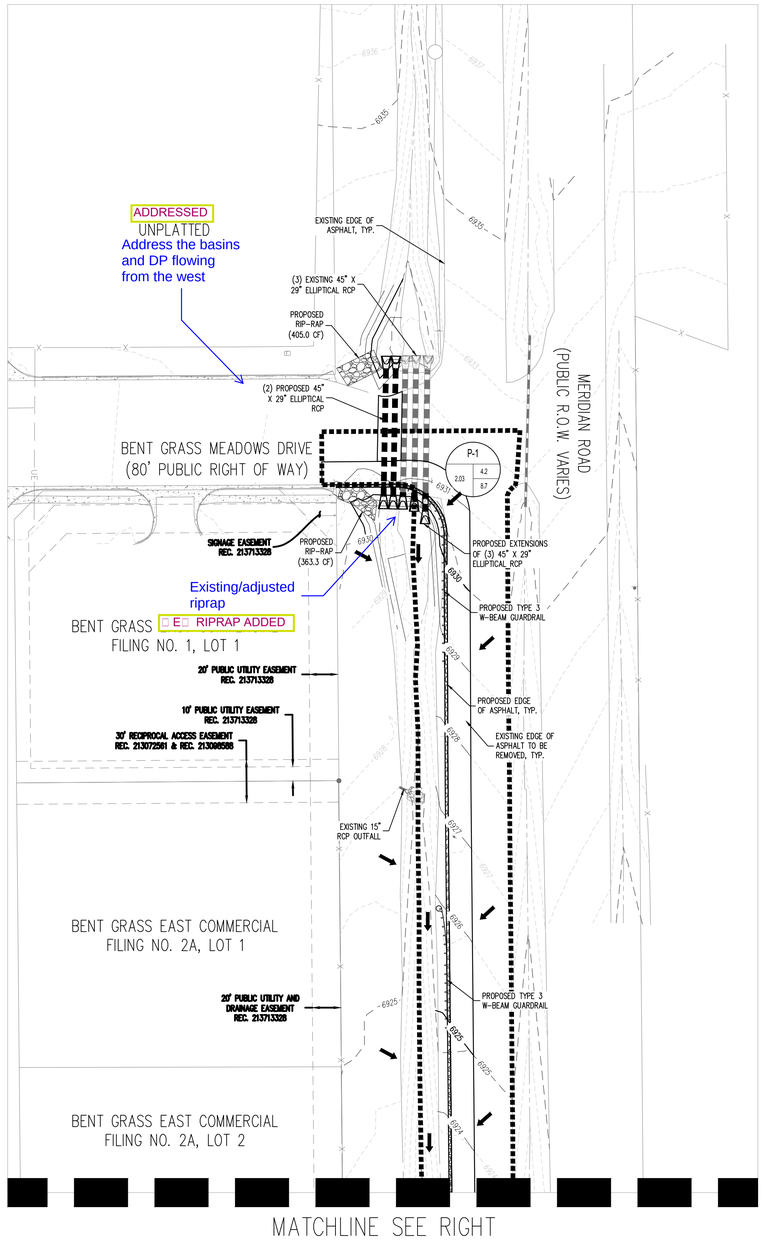
BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
COLORADO SPRINGS, COLORADO

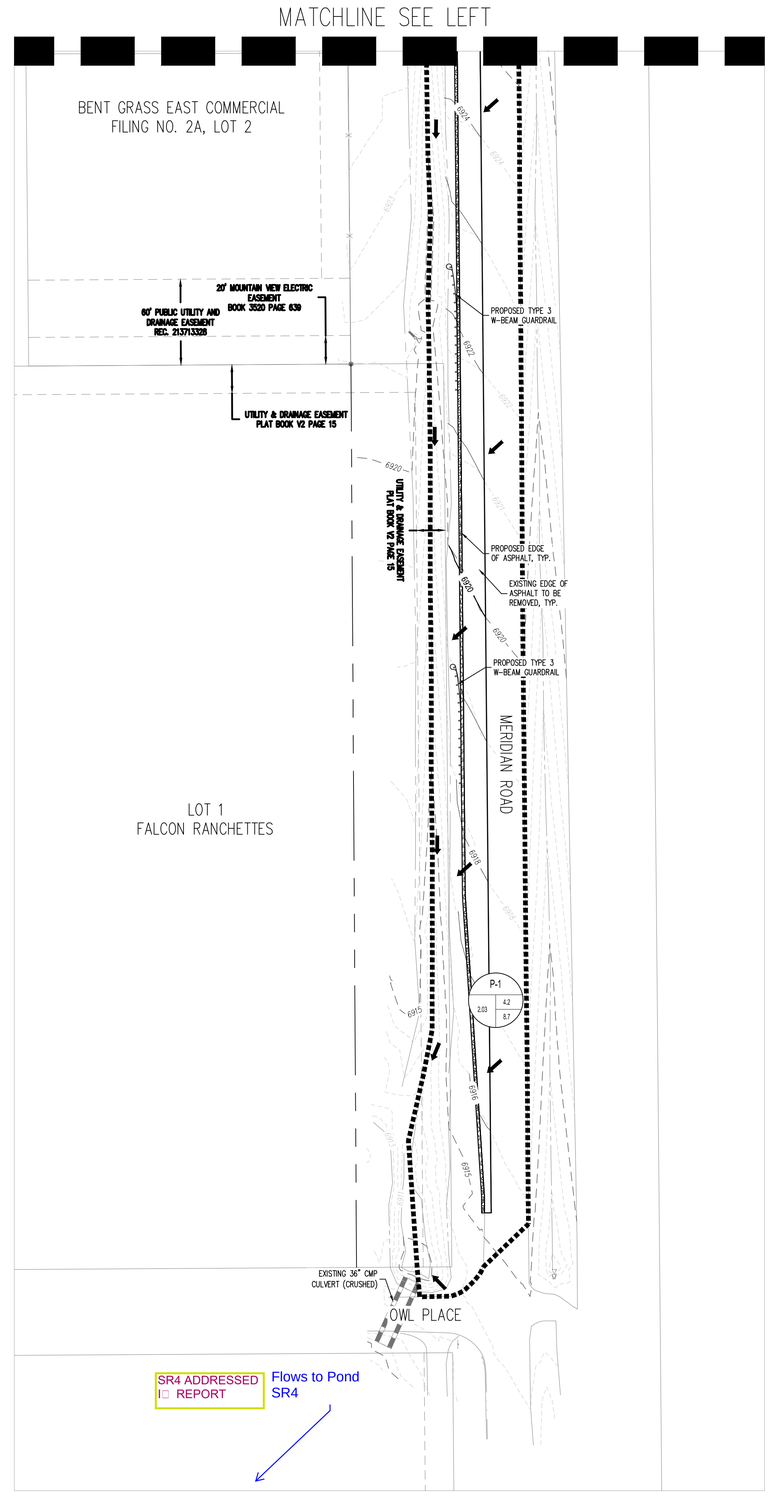
#	Date	Issue / Description	Init.

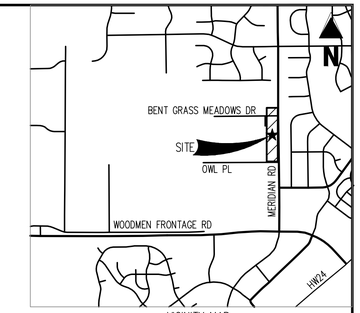
Project No:	CLH15.20
Drawn By:	BHB
Checked By:	SMB
Date:	NOVEMBER 2019

HISTORIC DRAINAGE MAP

DR-1







VICINITY MAP

N

0 10 20 50

SCALE: 1"=50'

DRAINAGE LEGEND

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- BASIN BOUNDARY LINE
- BASIN DESIGNATION
- 5-YEAR RUNOFF IN CUBIC FEET PER SECOND
- 100-YEAR RUNOFF IN CUBIC FEET PER SECOND
- BASIN AREA IN ACRES
- DESIGN POINT
- DIRECTION OF RUNOFF

Galloway
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NOT FOR CONSTRUCTION

CHALLENGER HOMES

BENT GRASS MEADOW DRIVE & MERIDIAN ROAD
ROADWAY IMPROVEMENTS
DRAINAGE PLAN

BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
COLORADO SPRINGS, COLORADO

#	Date	Issue / Description	Init.

Project No:	CLH15.20
Drawn By:	BHB
Checked By:	SMB
Date:	NOVEMBER 2019

PROPOSED DRAINAGE MAP

DR-2

COMMENT RESPONSES – CD’S

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE

COUNTY OF EL PASO, STATE OF COLORADO

CONSTRUCTION DOCUMENTS

SPRING 2020

GALLOWAY RESPONSE

GENERAL CONSTRUCTION NOTES

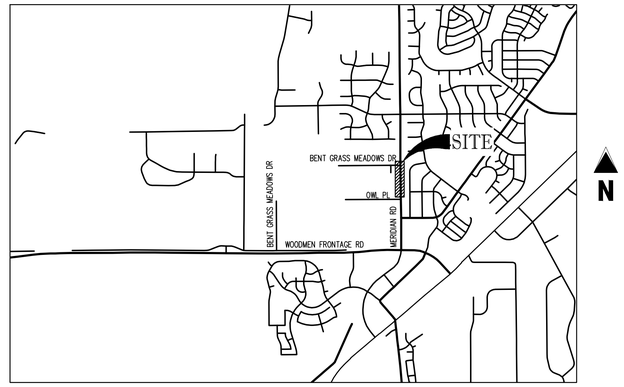
1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPLACED AT THE CONTRACTORS EXPENSE AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
3. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
4. ALL BACKFILL, SUB-BASE AND / OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED TO THE SOILS ENGINEERS RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY PCD ENGINEERING DIVISION.
5. ALL STATIONING IS CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE INDICATED.
6. ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO THE EPC ECM APPENDIX K – 1.2C.
7. ALL INTERSECTION ACCESSES TO BE CONSTRUCTED WITH A 25 FOOT SIGHT VISIBILITY TRIANGLES AND THERE SHALL BE NO OBSTRUCTIONS GREATER THAN 18" IN THIS AREA.
8. ALL CULVERT AND STORM PIPES SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE (HDPE), OR REINFORCED CONCRETE PIPE (RCP), ALL CULVERTS SHALL BE PLACED COMPLETE WITH FLARED END SECTIONS. ADEQUACY OF MATERIAL THICKNESS FOR ANY CSP INSTALLED SHALL BE VERIFIED BY OWNERS GEOTECHNICAL ENGINEER TO SUPPORT MINIMUM 50 YEAR DESIGN LIFE. CULVERTS MUST CONFORM TO EPC ECM SECTION 3.32 – CULVERTS.
9. ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED FOR ROADS SHALL BE PER DESIGN REPORT BY OWNERS GEOTECHNICAL ENGINEER. OWNERS GEOTECHNICAL ENGINEER TO BE ON SITE AT TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION PRIOR TO CONSTRUCTION.
10. TYPE M RIP-RAP WITH 4" OF TYPE II GRANULAR BEDDING AND MIRAFI 180N OR EQUAL MAY BE SUBSTITUTED WHERE TYPE L RIP-RAP WITH MIRAFI FW 700 OR EQUAL IS SPECIFIED.
11. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN COMPLIANCE WITH ANY AND ALL APPLICABLE EL PASO COUNTY STANDARDS AND WITH WOODMAN HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
12. ALL POTABLE WATER MAINS SHALL BE AWWA C900-SDR18 PVC WITH PUSH-ON SINGLE GASKET TYPE JOINTS AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
13. ALL WATER MAIN FITTINGS SHALL BE MADE FROM GRAY-IRON OR DUCTILE IRON AND FURNISHED WITH MECHANICAL JOINT ENDS. ALL FITTINGS SHALL HAVE A PRESSURE RATING OF 250 PSI AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
14. ALL WATER LINE BENDS, TEES, BLOW-OFFS AND PLUGS AT DEAD-END MAINS SHALL BE PROTECTED FROM THRUST BY USING CONCRETE THRUST BLOCKS AND / OR RODDING AND RESTRAINED PIPE PER THE PAINT BRUSH HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
15. MAXIMUM DEFLECTION OF 8" OR 12" PVC WATER MAIN JOINTS IS 4 DEGREES. CORRESPONDING MINIMUM CURVE RADIUS IS 286'. ADDITIONAL 11.25° OR 22.5° BENDS MAY BE REQUIRED FOR PROPER ALIGNMENT.
16. CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILED AS-BUILTS OF ALL WATER MAIN, STORM SEWER AND SANITARY. SEWER MAIN INSTALLATIONS, INCLUDING ACCURATE DISTANCES OF MAIN LINES, VALVES, FITTINGS, MANHOLES AND LOCATIONS OF WATER AND SEWER SERVICES.
17. SANITARY SEWER PIPE AND FITTINGS: PVC 4" – 8" ASTM D3034, TYPE PSM, SDR 35: PUSH-ON JOINTS AND MOLDED RUBBER GASKETS MAXIMUM HORIZONTAL DEFLECTIONS, AFTER INSTALLATION AND BACK FILLING SHALL NOT EXCEED 3% OF THE PIPE DIAMETER. (MINIMUM CURVE RADIUS IS 100' FOR 8" PVC SANITARY SEWER MAIN)

STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFFSITE WATERS, INCLUDING WETLANDS.
2. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A "NOTICE TO PROCEED" HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF.
5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES IS NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN PRIOR TO IMPLEMENTATION.
7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.
8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70 PERCENT OF PRE-DISTURBANCE LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.
9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME. PRE-EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A WATERS OF THE STATE, UNLESS INFEASIBLE.
11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
12. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF SITE.
13. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.
14. DEWATERING OPERATIONS: UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT MAY NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF.
15. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
16. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
17. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
19. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
20. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
21. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCH FLOW LINE.
24. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ROCKY MOUNTAIN GROUP AND SHALL BE CONSIDERED A PART OF THESE PLANS.
29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL DIVISION
WQCD -PERMITS
4300 CHERRY CREEK DRIVE SOUTH
DENVER, CO 80246-1530
ATTN: PERMITS UNIT

H:\Challenger Homes Inc\CO, El Paso County-CLH000016.20-Meridian Road\CADD\3-CD\CD\CLH015_P_01-Cover.dwg - Treven Edwards - 6/11/2020



VICINITY MAP
NTS

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   - A. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   - B. CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   - C. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   - D. CDOT M & S STANDARDS
4. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) – INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

SIGNING AND STRIPING NOTES

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE "D" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4" UPPER-LOWER CASE LETTERING ON 8" BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6" LETTERING, UPPER-LOWER CASE ON 12" BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8" UPPER-LOWER CASE LETTERING ON 18" BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75" X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100" MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24" IN WIDTH. CROSSWALKS LINES SHALL BE 12" WIDE AND 8' LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.

LIST OF CONTACTS

APPLICANT/DEVELOPER

CHALLENGER COMMUNITIES, LLC
13570 NORTHGATE ESTATES DR.
COLORADO SPRINGS, CO 80921
TEL: (719) 598-5190
CONTACT: JIM BYERS
EMAIL: JIM@MYCHALLENGERHOMES.COM

ENGINEER

GALLOWAY & COMPANY, INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, COLORADO 80920
TEL: (719) 900-7220
CONTACT: GRANT DENNIS, P.E.
EMAIL: GRANTDENNIS@GALLOWAYUS.COM

EL PASO COUNTY

EL PASO COUNTY, PLANNING & COMMUNITY DEVELOPMENT
2880 INTERNATIONAL CIRCLE, SUITE 110
COLORADO SPRINGS, COLORADO 80910
TEL: (719) 520-6300

SURVEYOR

GALLOWAY & COMPANY, INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, COLORADO 80920
TEL: (719) 900-7220
CONTACT: LYLE BISSEGGER
EMAIL: LYLEBISSEGGER@GALLOWAYUS.COM

UTILITY REVIEW – WATER/WASTEWATER

WOODMEN HILLS METRO DISTRICT
8046 EASTONVILLE ROAD
FALCON, COLORADO 80831
TEL: (719) 495-2500
CONTACT: JERRY JACOBSON
EMAIL: JERRY@WHMD.ORG

UTILITY REVIEW – GAS

CITY OF COLORADO SPRINGS
1521 HANCOCK EXPY #4801
COLORADO SPRINGS, COLORADO 80903
TEL: (719) 668-8267
CONTACT: RYNE SOLBERG
EMAIL: RSOLBERG@CSU.ORG

ELECTRIC

MOUNTAIN VIEW ELECTRIC
11140 E WOODMEN RD
FALCON, COLORADO 80831
TEL: (719) 495-2283

FIRE DISTRICT

FALCON FIRE PROTECTION DISTRICT
7030 OLD MERIDIAN ROAD
PEYTON, COLORADO 80831
TEL: (719) 495-4050
EMAIL: FALCONFIRE@FALCONFIREPD.ORG

Sheet List Table

SHEET NUMBER	SHEET DESCRIPTION	SHEET TITLE
1	C0.0	COVER SHEET
2	C1.0	EXISTING CONDITOINS & DEMOLITION PLAN
3	C2.0	MERIDIAN ROAD STREET IMPROVEMENT PLAN
4	C3.0	MERIDIAN ROAD GRADING PLAN
5	C4.0	MERIDIAN ROAD DRAINAGE PLAN
6	C5.0	SIGNAGE AND STRIPING PLAN
7	C6.0	MERIDIAN ROAD TYPICAL SECTIONS
8	C6.1	MERIDIAN SOUTHBOUND ROAD SECTIONS

Reference the separate signal plans by LSC.

Signal plans listed and referenced as under separate cover

Engineering Review
07/15/2020 5:35:25 PM
dsdrice
JeffRice@elpasoco.com
(719) 520-7877
EPC Planning & Community Development Department

See comment letter also.

Noted

ENGINEER'S STATEMENT

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.

____________________ __________
RONALD G. DENNIS, COLORADO P.E. NO. 0051622 DATE

OWNER'S STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN AND ALL OF THE REQUIREMENT SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

CHALLENGER COMMUNITIES, LLC DATE

EL PASO COUNTY

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/ OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT. FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. DATE
COUNTY ENGINEER / ECM ADMINISTRATOR

CAUTION – NOTICE TO CONTRACTOR

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MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
CONSTRUCTION DOCUMENTS
FOR
CHALLENGER COMMUNITIES, LLC

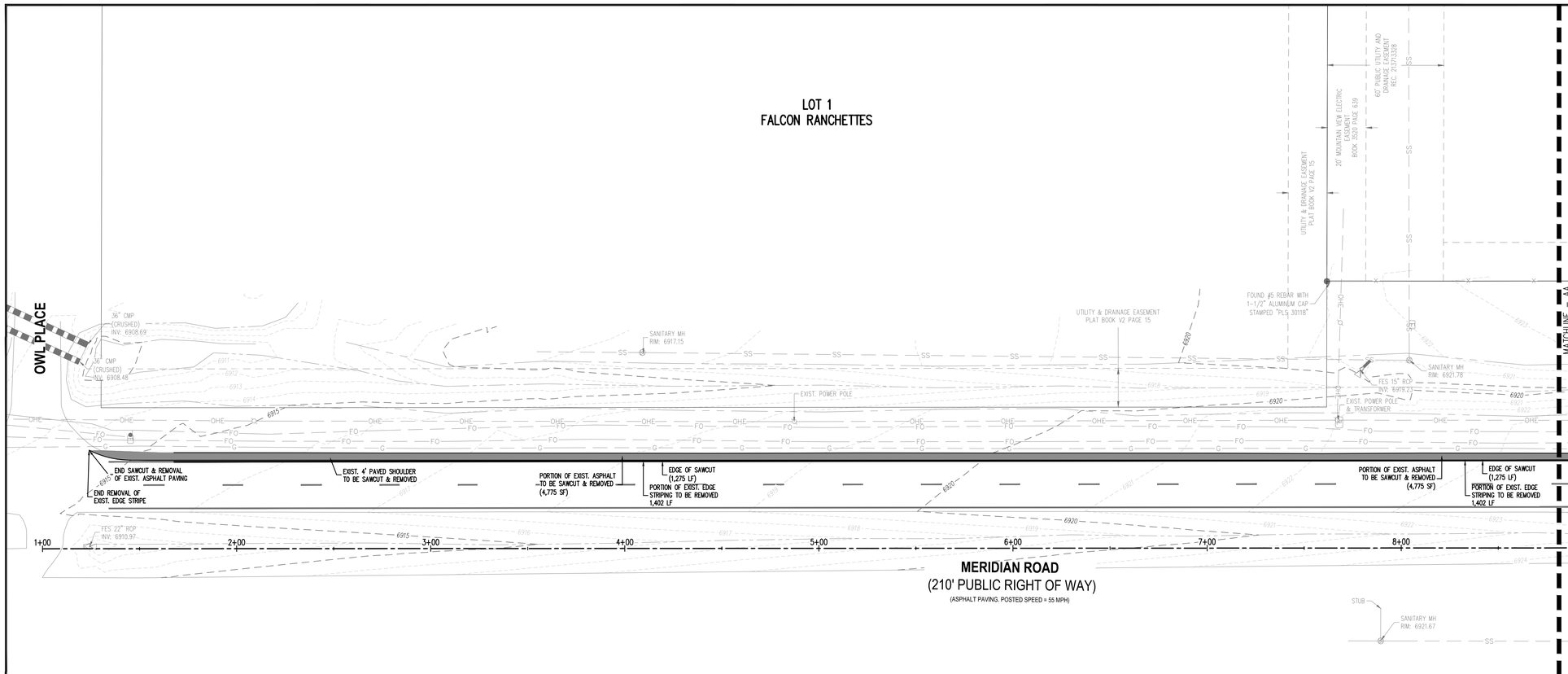
SWC BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 EL PASO COUNTY

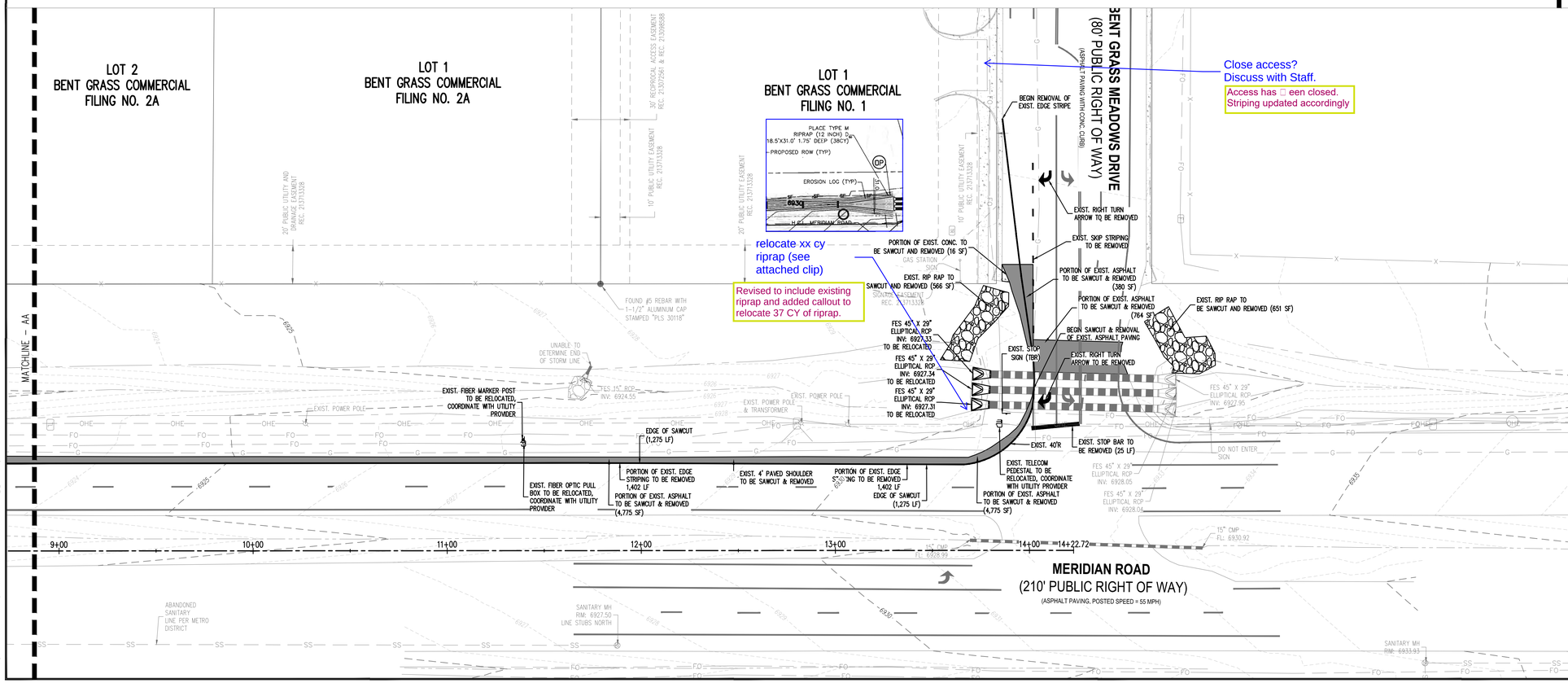
#	Date	Issue / Description	Init.
1	04/07/20	REV PER COUNTY COMMENTS	TJE

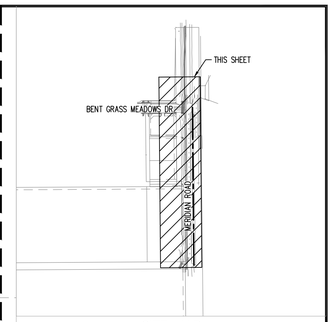
Project No: CLH0015.20
Drawn By: JDP
Checked By: RGD
Date: 11/15/2019

COVER SHEET

C0.0
Sheet 1 of 8







SITE MAP
SCALE: 1" = 600'

N

0 15 30
SCALE: 1"=30'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING FIBER OPTIC LINE
- EXISTING SANITARY SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE LINE
- EXISTING STORM LINE
- FOUND PROPERTY MONUMENT
- EXISTING SANITARY MANHOLE
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING UTILITY MARKER POST
- EXISTING TELECOM PEDESTAL
- EXISTING ELECTRICAL TRANSFORMER
- FIBER OPTIC PULL BOX
- EXISTING FLARED END SECTION
- EXISTING UTILITY POLE
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING ASPHALT TO BE REMOVED
- EXISTING CONCRETE TO BE REMOVED
- EXISTING GRAVEL TO BE REMOVED

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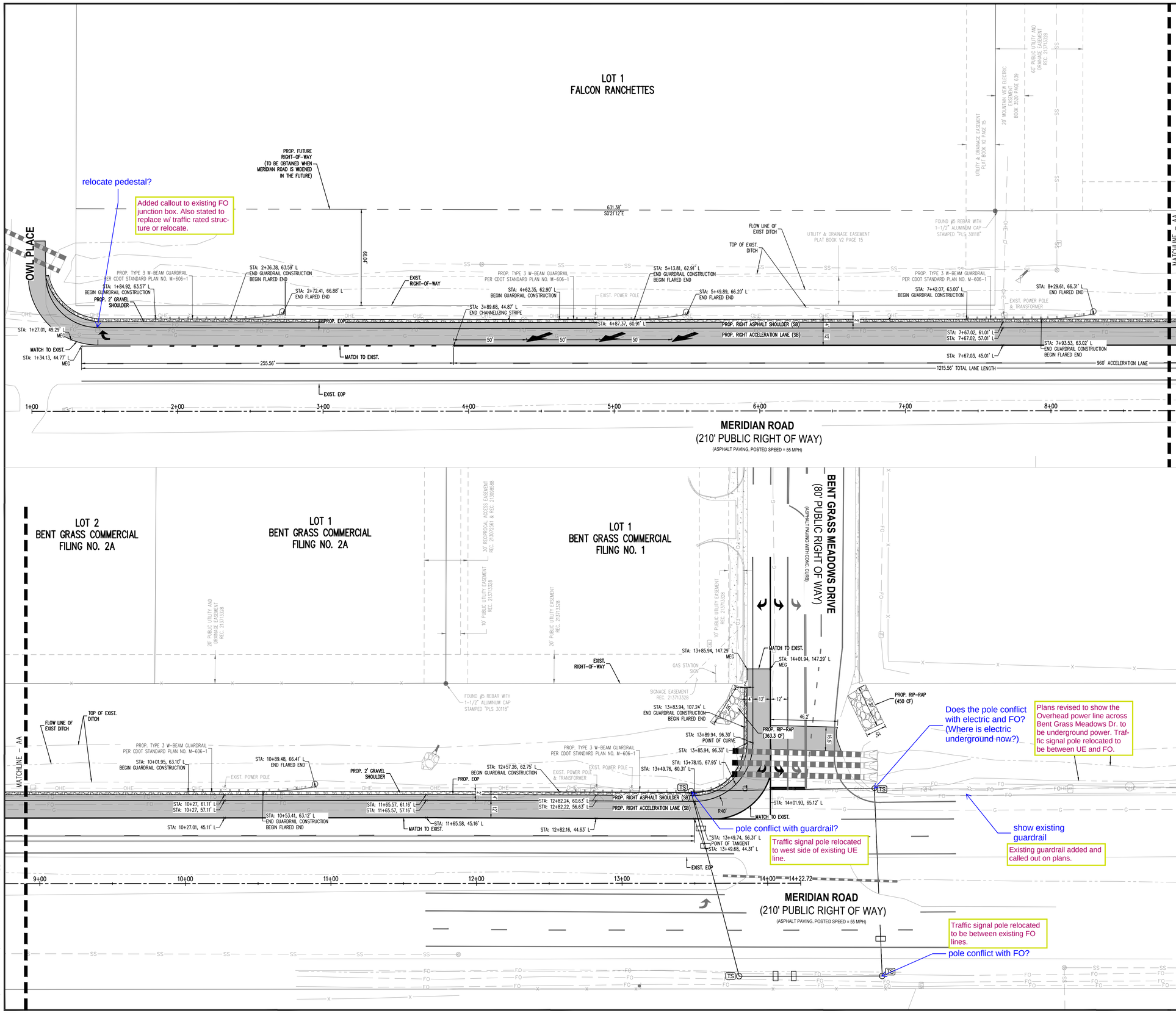
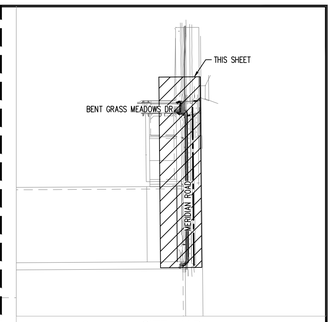
Date:	11/15/2019

EXISTING CONDITOINS & DEMOLITION PLAN

C1.0

Sheet 2 of 8





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SCALE: 1" = 600'

N

0 15 30
SCALE: 1"=30'

LEGEND

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- EXISTING SIGN
- EXISTING UTILITY MARKER POST
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- EXISTING ELECTRICAL TRANSFORMER
- FIBER OPTIC PULL BOX
- EXISTING FLARED END SECTION
- EXISTING UTILITY POLE
- PROPOSED 8" THICK STRIPING
- PROPOSED 4" THICK STRIPING
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- PROPOSED GRAVEL
- PROPOSED SIGN

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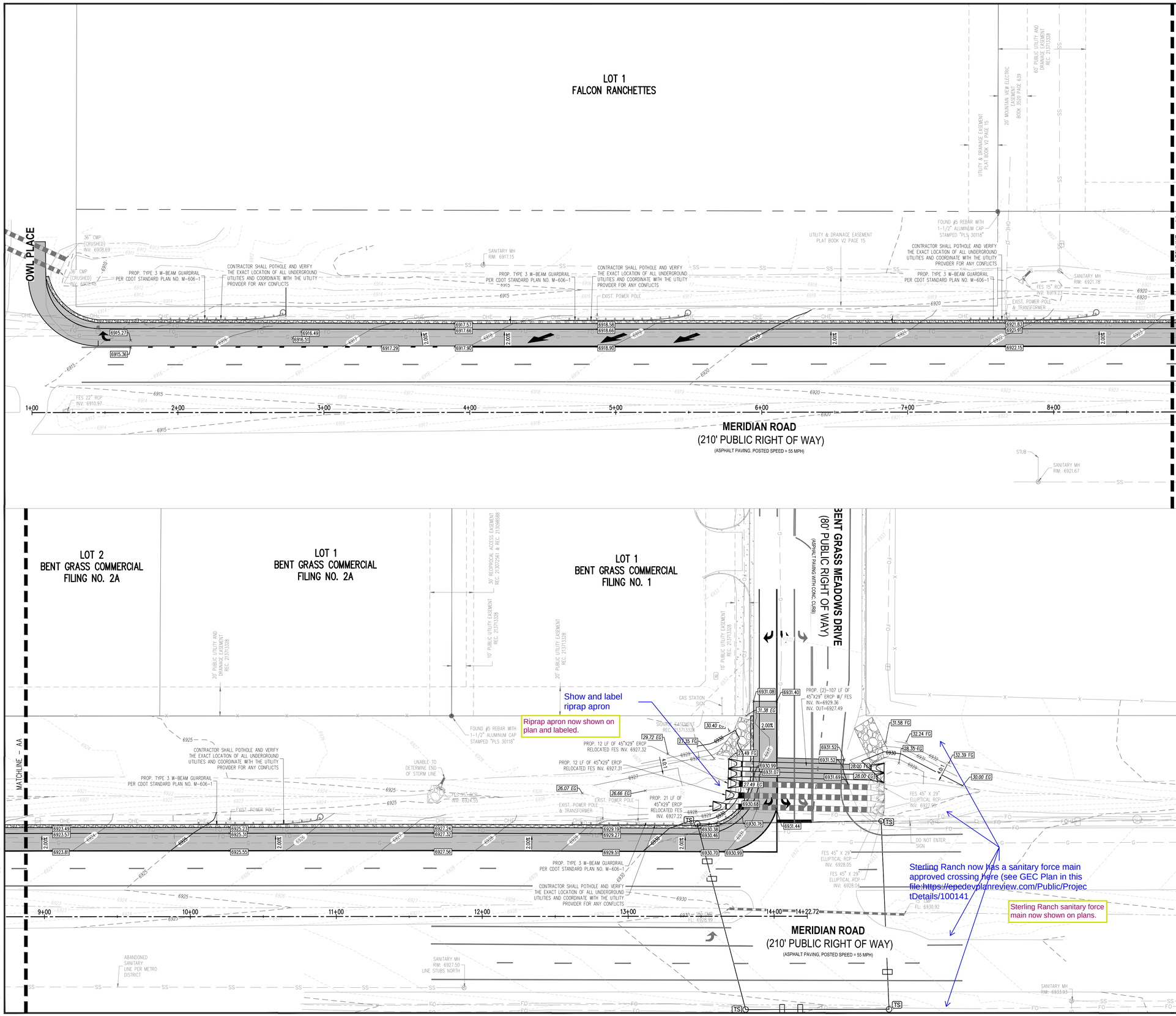
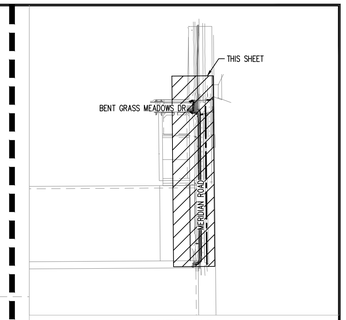
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

MERIDIAN ROAD STREET IMPROVEMENT PLAN

C2.0
Sheet 3 of 8





SITE MAP
SCALE: 1" = 600'

N

0 15 30
SCALE: 1"=30'

LEGEND

- EXISTING PROPERTY LINE
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- PROPOSED MAJOR CONTOUR
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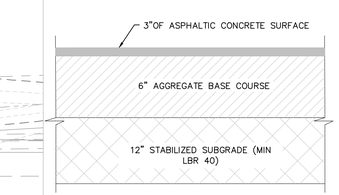

ASPHALT PAVEMENT DETAIL
NOT TO SCALE

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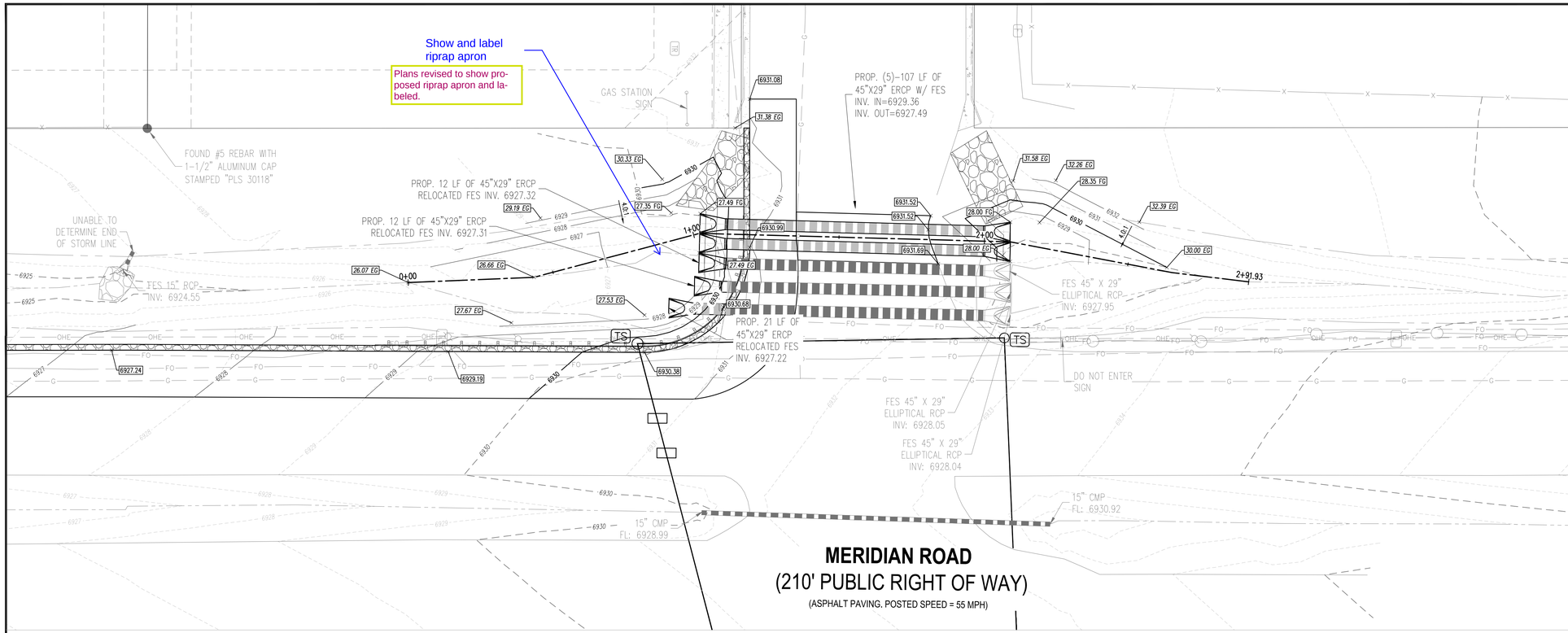
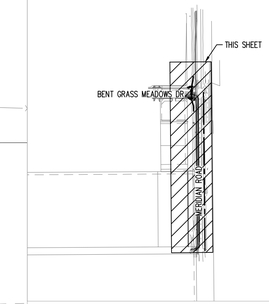
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

MERIDIAN ROAD GRADING PLAN

C3.0
Sheet 4 of 8





SITE MAP
SCALE: 1" = 600'

SCALE: 1"=30'

LEGEND

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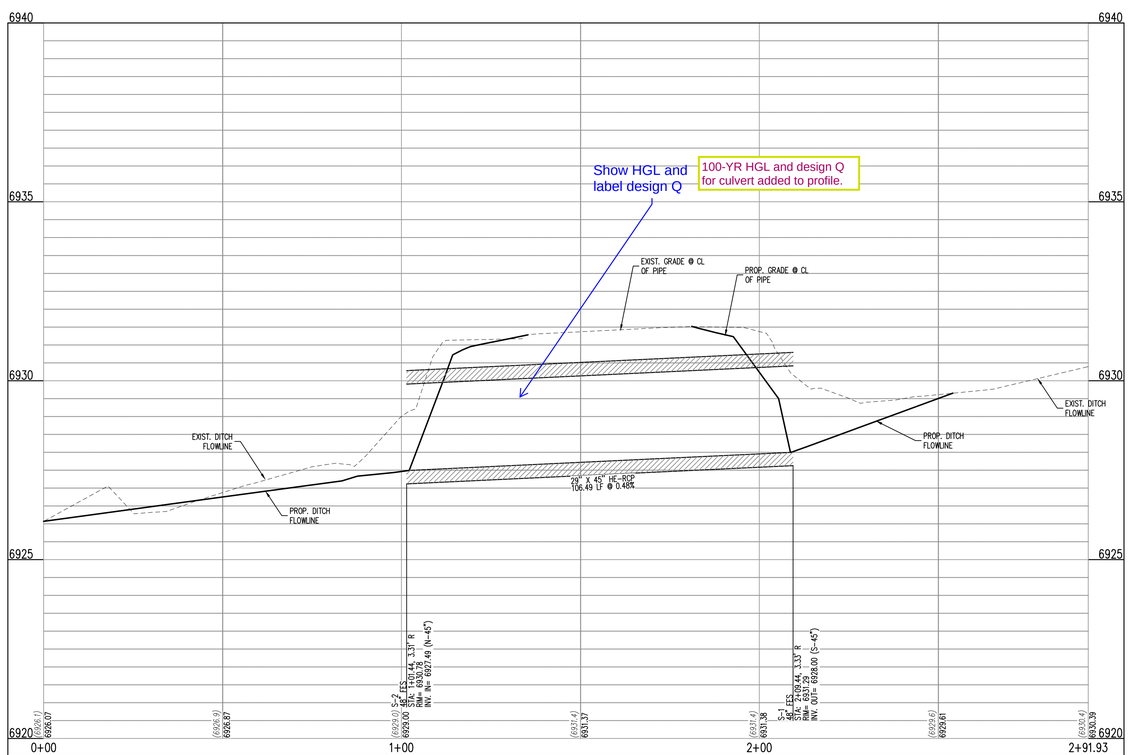

PROP. STORM DRAIN
STA: 0+00 – 2+91.93
SCALE: H: 1"=20' V: 1"=2'

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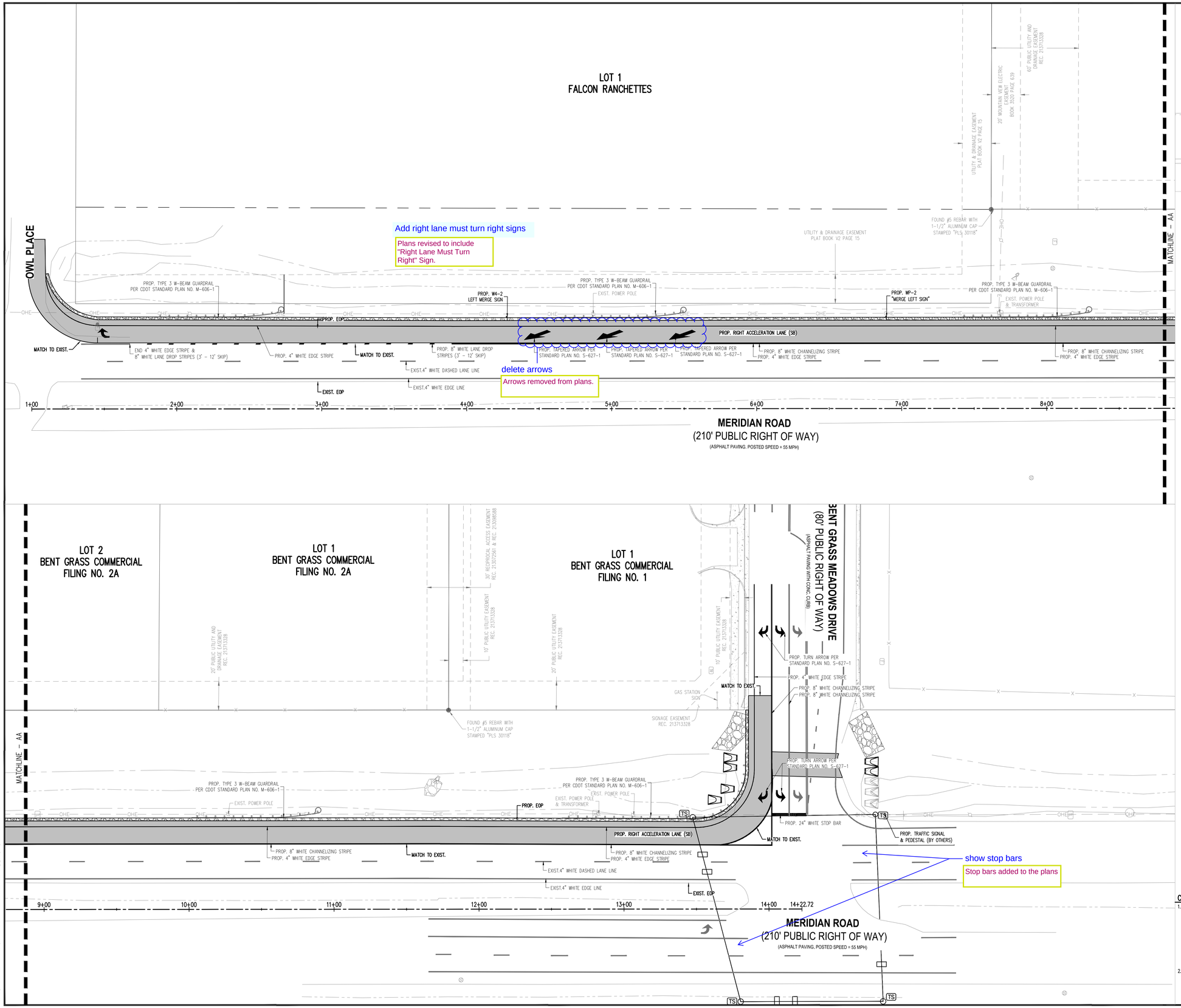
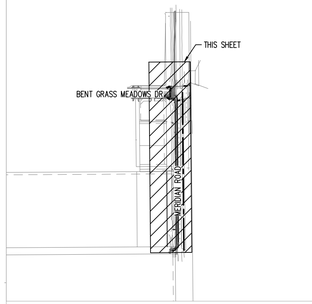
Project No:	IAA000001
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

MERIDIAN ROAD DRAINAGE PLAN

C4.0
Sheet 5 of 8





SITE MAP
SCALE: 1" = 600'

N

0 15 30
SCALE: 1"=30'

LEGEND

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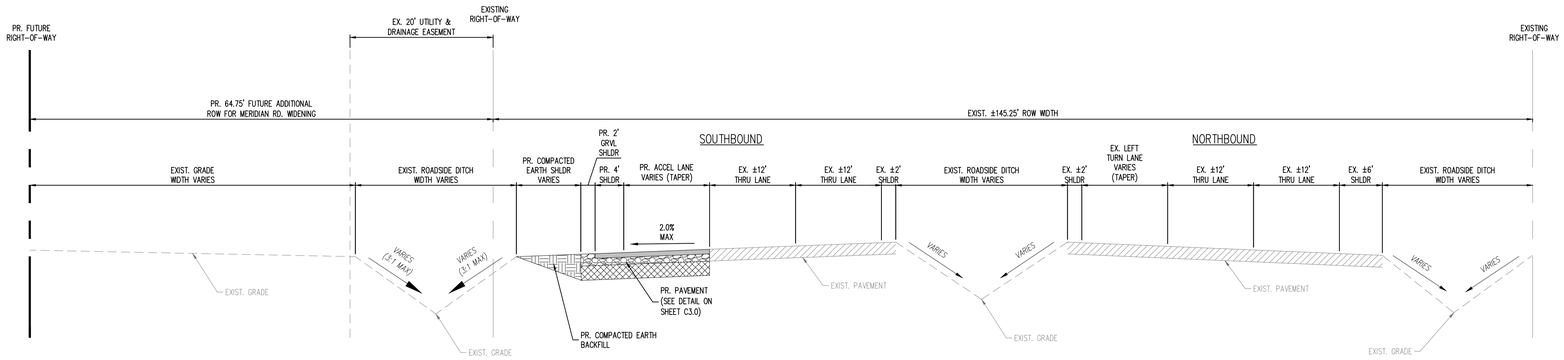
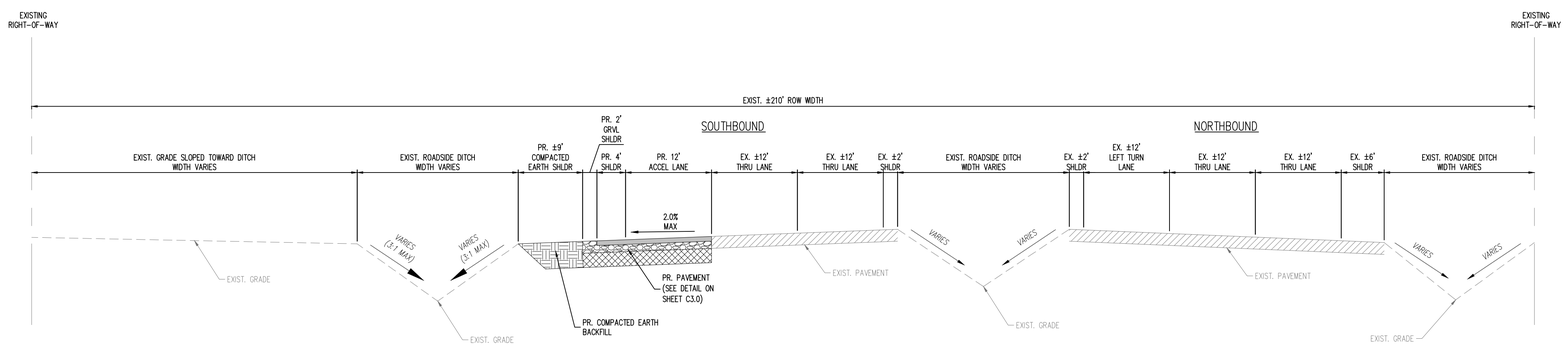
SIGNAGE AND STRIPING PLAN

C5.0

Sheet 6 of 8



TYPICAL SECTION – MERIDIAN ROAD
STA. 1+67.68 TO STA. 7+61.60



TYPICAL SECTION – MERIDIAN ROAD
STA. 7+61.60 TO STA. 13+85.94

NOTES:

1. SEE SHEET C5.1 FOR ADDITIONAL ROADWAY PROFILES.
2. EXISTING ROADWAY AND DITCH WIDTHS VARY. CONTRACTOR SHOULD VERIFY ACTUAL WIDTHS IN THE FIELD.

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Checked By:	RGD
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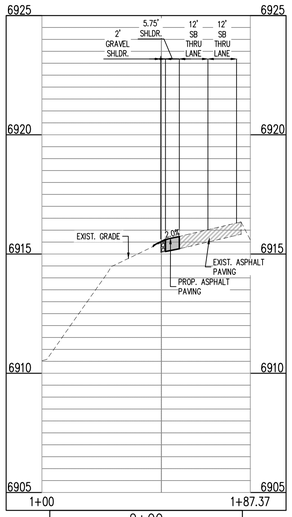
MERIDIAN ROAD TYPICAL SECTIONS

C6.0



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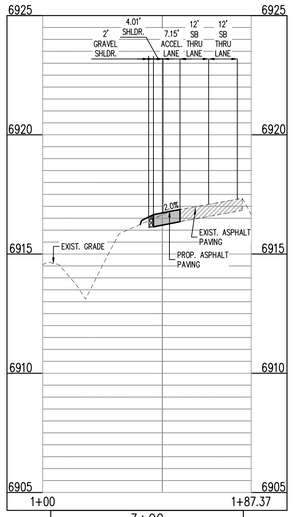
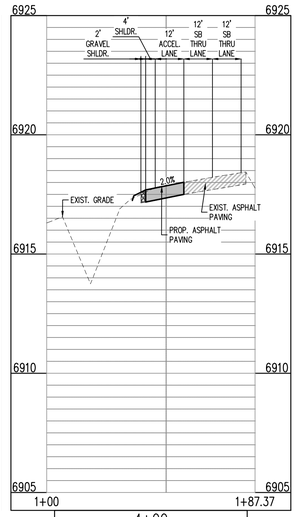


3+00
STA: 1+00 – 1+87.37
SCALE: H: 1"=30' V: 1"=3'



4+00
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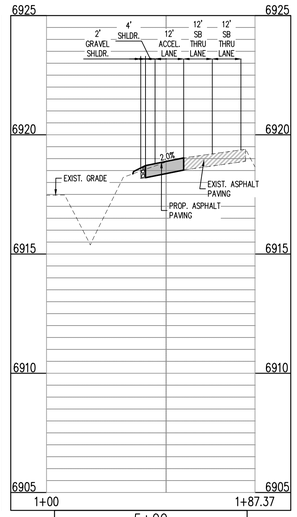

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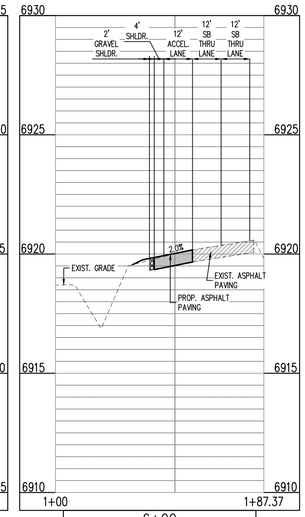

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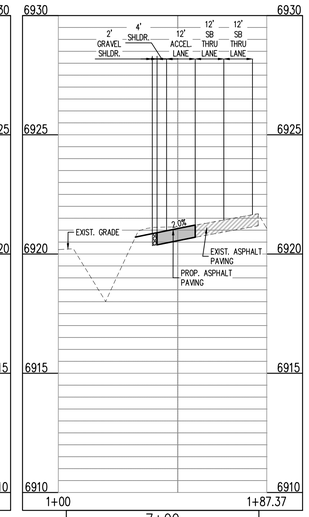

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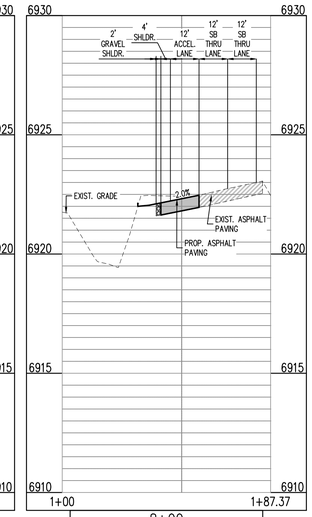

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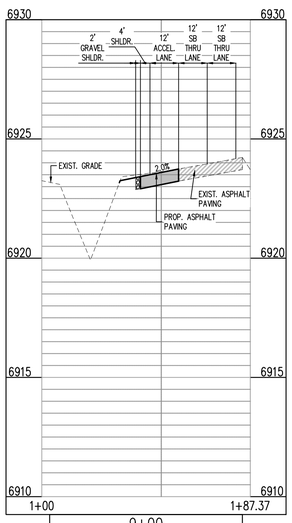
Label all ditch foreslopes and backslopes.

All foreslopes and backslopes labeled.



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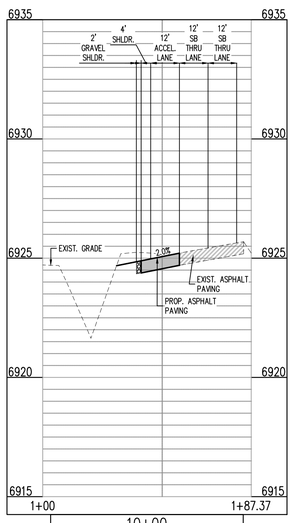

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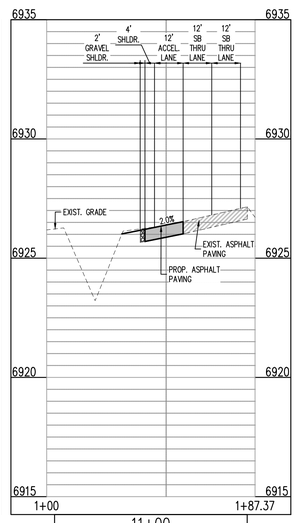

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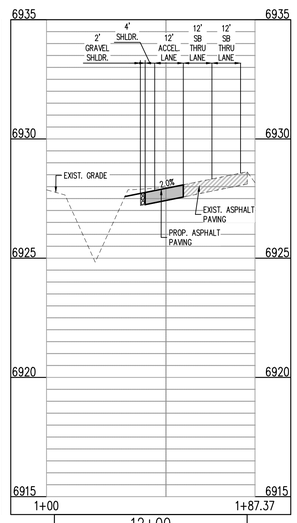

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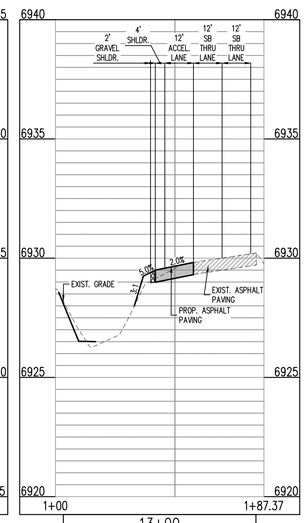

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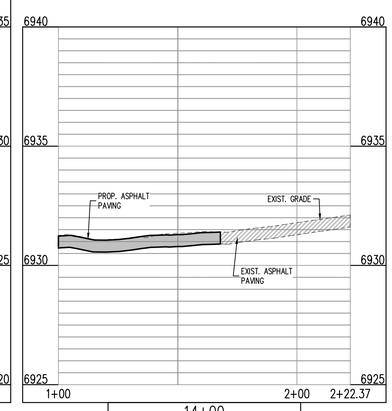

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SCALE: H: 1"=30' V: 1"=3'

CAUTION – NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE FIELD LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEEER PRIOR TO CONSTRUCTION.
2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

811 Know what's below. Call before you dig.

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
CONSTRUCTION DOCUMENTS
FOR
CHALLENGER COMMUNITIES, LLC

SWC BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 EL PASO COUNTY

#	Date	Issue / Description	Init.
1	04/07/20	REV PER COUNTY COMMENTS	TJE

Project No:	IAA000001
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

MERIDIAN SOUTHBOUND ROAD SECTIONS

C6.1

COMMENT RESPONSES – TRAFFIC SIGNAL PLANS

Construction Drawings for Meridian Rd./Bent Grass Meadows Dr. Intersection Improvements

Bent Grass Metro District, County of El Paso, State of Colorado

INDEX OF SHEETS

VICINITY

Engineering Review
07/27/2018 10:23 AM
Justice
JeffHodson@lsctrans.com
(719) 520-7877
EPC Planning & Community Development Department

1

Also see comment letter: 2

List of agencies (stakeholder) with addresses & points of contact

Applicant: Bent Grass Metropolitan District c/o Randy Case II 102 E. Pikes Peak, Colorado Springs, Co. 80903

Civil Engineer: Classic Consulting, 619 N. Cascade Ave. Suite 200 Colorado Springs, CO 80903

Traffic Engineer: LSC Transportation Consultants, Inc., 2504 E. Pikes Peak Ave., Suite 304 Colorado Springs, CO 80909, Jeff Hodsdon, 719-633-2896

Local Improvement District: Bent Grass Metropolitan District: c/o Randy Case II 102 E Pikes Peak Ave, Colorado Springs, CO 80903; Phone:(719) 633-2700.

El Paso County Engineering: EPC Public Services, 3275 Akers Drive, Colorado Springs, CO 80922, [Jennifer Irvine, P.E., County Engineer]

Fire District or Department: Falcon Fire Protection District, Chief Trent Harwig, 7030 N. Meridian Road, Falcon, CO 80831 719-495-4650

Utility Company (Electric): Mountain View Electric, Jim Kennel, 11140 E. Woodmen Road Falcon, CO 80831, 719-495-2283

Utility Company (Telephone): Falcon Broadband, Randy Berkoung, 555 Hathaway Drive Colorado Springs, CO 80915, 719-886-7601

Utility Company (Gas): CSU, Todd Sturtevant, John Pinkerton Location, 7710 Durant Dr Colorado Springs, CO 80920, 719-668-3526

Utility Company (Water): Cherokee Metro District, Art Sintas, 6250 Palmer Park Blvd. Colorado Springs CO 80915, 719-597-5080

Utility Company (Cable): Cherokee Metro District, Art Sintas, 6250 Palmer Park Blvd. Colorado Springs CO 80915, 719-597-5080

Design Engineer's Signature & Stamp:

These detailed plans and specifications were prepared under my direction and supervision. Said plans and specifications are in conformity with applicable master plans and master transportation plans, roadway, drainage, grading and erosion control plans and specifications, and said plans and specifications are in conformity with applicable master drainage plans and master transportation plans. Said plans and specifications are adequate and sufficient for the purpose for which they are intended and are correct to the best of my knowledge and belief. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparation of these detailed plans and specifications.

COLORADO REGISTERED PROFESSIONAL ENGINEER JEFFREY C. HODSDON 31684 7/27/18 PROFESSIONAL ENGINEER

Jeffrey C. Hodsdon, P.E. #31684 Date

Owner/Developer's Statement:

I, the owner/developer have read and will comply with all of the requirements specified in these detailed plans and specifications.

Title: Randy Case II Date
Business Name: Bent Grass Metropolitan District
Address: 102 E. Pikes Peak, Colorado Springs, CO. 80903

Should this be Challenger Communities, LLC or is the district providing financial assurances and agreements to ensure completion? 3

El Paso County:

County plan review is provided only for general conformance with County Design Criteria. The County is not responsible for the accuracy and adequacy of the design hydrology and hydraulics. All design elements shall be confirmed at the job site. The County through the approval of this document assumes no responsibility for completeness and/or accuracy of this document.

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volumes 1 and 2, and Engineering Criteria Manual as amended.

In accordance with ECM Section 1.12, these construction documents will be valid for construction for a period of two (2) years from the date of first review. If the construction has not commenced and is diligently pursued within these 2 years, the plans will need to be resubmitted for approval including payment of review fees at the Planning and Community Development Directors discretion.

Jennifer Irvine, P.E. Date
County Engineer / ECM Administrator

TRAFFIC CONTROL SIGNAL PLANS
Bent Grass Meadows Dr./Meridian Rd.

2504 E. Pikes Peak Ave. Suite 210 Colorado Springs, CO 80909
LSC TRANSPORTATION CONSULTANTS
2504 E. Pikes Peak Ave. Suite 304 Colorado Springs, Co. 80909
719-633-2896 719-633-2896 FAX: 719-633-5430

Project Manager
JEFFREY C. HODSDON, PE

REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 7/17/18
SCALE: 1" = 100'
DRAWN BY: sfr
JOB NO.: 154160
DWG: 154160_Signal Plan.dwg

SHT NO. : 1
OF 6

LSC Responses to Signal Plan Redline Comments

Page: [2] 194900_Signal Plan Sheets-Cover

Number: 1 Author: dsdrice Subject: EPC ENG Review Date: 7/17/2020 09:22:32

Number: 2 Author: dsdrice Subject: Text Box Date: 7/17/2020 09:22:48

Also see comment letter.

Number: 3 Author: dsdrice Subject: Callout Date: 7/16/2020 15:15:17

Should this be Challenger Communities, LLC or is the district providing financial assurances and agreements to ensure completion?

Author: jchodsdon Subject: Sticky Note Date: 7/29/2020 18:03:15

LSC Response: This will be confirmed or changed with the final plan set.

GENERAL NOTES

PROJECT DESCRIPTION
TRAFFIC SIGNAL INSTALLATION, SIGNING AND MARKING AT BENT GRASS MEADOWS DRIVE AND MERIDIAN ROAD.

GENERAL NOTES

1 THE OWNER / DEVELOPER / DISTRICT SHALL CONTRACT WITH A QUALIFIED PROFESSIONAL ENGINEERING CONSULTANT FOR THE DESIGN, DEVELOPMENT, AND PROGRAMMING OF ALL TRAFFIC SIGNAL TIMING AND CONTROLLER OPERATIONAL PARAMETERS, SETTINGS, ADJUSTMENTS, AND EQUIPMENT THAT WILL ACHIEVE SATISFACTORY TRAFFIC SIGNAL OPERATION, INCLUDING ISOLATED, INDEPENDENT, FULLY-ACTUATED SIGNAL OPERATION AND SIGNAL SYSTEM COORDINATION TIMING PLANS OPERATION WITH EXISTING ADJACENT SIGNALIZED INTERSECTIONS, WHERE DOCUMENTED TO BE NECESSARY DURING VARIOUS TIMES OF THE DAY.

2 TRAFFIC SIGNAL MATERIALS AND INSTALLATION SHALL COMPLY WITH THE SPECIFICATIONS FOR THIS PROJECT, THE PROJECT SPECIAL PROVISIONS, "STATE OF COLORADO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", "COLORADO STANDARD PLANS", "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "THE NATIONAL ELECTRIC CODE", AND ALL LOCAL ORDINANCES AND REGULATIONS.

3 THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD PLAN SHEET S-614-40" TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS" ARE TO BE USED TO CONSTRUCT THIS PROJECT, EXCEPT THAT ALL POLES, ~~MAST ARMS~~ AND EQUIPMENT SHALL BE PAINTED BLACK.

4 ALL SUBMITTALS SHALL BE MADE TO EL PASO COUNTY FOR APPROVAL. OBTAIN ALL REQUIRED PERMITS FOR THE WORK. PREPARE AND SUBMIT TRAFFIC CONTROL PLAN FOR THE WORK. CONTACT EL PASO COUNTY 24 HRS IN ADVANCE OF BEGINNING CONSTRUCTION.

5 LOCATIONS OF ALL CONDUIT RUNS, DETECTORS, POLES, CONTROLLER CABINETS, PULL BOXES, AND FOUNDATIONS SHALL BE FIELD APPROVED BY EL PASO COUNTY. THE CONTRACTOR SHALL VERIFY POLE FOUNDATION AND ANCHOR BOLT ELEVATIONS WITH RESPECT TO TOP OF EXISTING OR FUTURE CURB AND SLOPE OF SIDEWALK PRIOR TO INSTALLATION OF ANY EQUIPMENT.

6 ALL PAVING, SIDEWALK, LANDSCAPING AND LAWN IRRIGATION SYSTEMS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED IN KIND, EQUAL TO OR EXCEEDING ORIGINAL CONDITIONS OR AS DIRECTED BY THE ENGINEER.

7 PAVEMENT MARKINGS ARE SHOWN FOR INFORMATION ONLY. REFER TO STRIPING PLANS FOR DETAILS.

8 CONTRACTOR TO VERIFY POWER SOURCE AND COORDINATE HOOK - UP WITH ELECTRIC UTILITY PROVIDER.

9 CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

TRAFFIC SIGNAL NOTES

1 THE CONTRACTOR SHALL PROVIDE, FOR REVIEW, BY THE ENGINEER, A COMPLETE TRAFFIC SIGNAL MATERIAL SUBMITTAL PACKAGE THAT CONTAINS , All OF THE PROPOSED TRAFFIC SIGNAL EQUIPMENT, INCLUDING MATERIAL SPECIFICATIONS AND DESCRIPTIONS THAT WILL BE NECESSARY TO COMPLETE THE TRAFFIC SIGNAL WORK. THE CONTRACTOR SHALL ALLOW FOR A MINIMUM THREE WEEK SUBMITTAL REVIEW PERIOD AND SHALL NOT ORDER ANY SIGNAL EQUIPMENT UNTIL AFTER A REVIEW OF ALL SUBMITTALS HAVE BEEN COMPLETED BY THE ENGINEER AND VERIFIED BY THE CONTRACTOR.

2 FUNCTIONAL AND OPERATIONAL RESPONSIBILITY FOR ALL NEWLY INSTALLED AND EXISTING TRAFFIC SIGNAL EQUIPMENT WILL BECOME THE RESPONSIBILITY OF THE CONTRACTOR UNTIL FINAL ACCEPTANCE OF THE PROJECT. THE CONTRACTOR SHALL CONSIDER THIS WORK INCIDENTAL TO THE OVERALL WORK BEING PERFORMED AND SHALL BE INCLUDED AS PART OF THE PROJECT.

3 SEE COLORADO DEPARTMENT OF TRANSPORTATION SIGNAL DETAILS FOR CONSTRUCTION/ INSTALLATION DETAILS NOT SHOWN ON THESE PLANS.

4 ALL SIGNAL EQUIPMENT REMOVED BY THE CONTRACTOR SHALL BE SALVAGED AND BECOME THE PROPERTY OF EL PASO COUNTY. THE SALVAGED EQUIPMENT SHALL BE DELIVERED AS DIRECTED BY THE ENGINEER. DELIVERY OF SIGNAL EQUIPMENT WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE WORK FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.

5 OVERHEAD STREET NAME SIGN DESIGN AND LAYOUT INFORMATION SHALL BE PER THE STREET NAME SIGN DETAIL CONTAINED IN THE PROJECT PLANS.

6 TRAFFIC SIGNS MOUNTED ON SIGNAL POLES ~~MAST ARMS, AND PEDESTALS~~ SHALL BE MOUNTED USING BANDING, ALUMINUM CHANNELS, AND BACKING ZEES PER APPLICABLE CDOT STANDARD PLANS, OR SIMILAR RIGID SIGN BRACING MOUNTING ASSEMBLY.

7 ONCE THE PROFESSIONAL ENGINEERING CONSULTANT HAS COMPLETED ALL TRAFFIC SIGNAL CONTROLLER TIMING DEVELOPMENT AND CONTROLLER PROGRAMMING, THE CONTRACTOR WILL COORDINATE THE DELIVERY DATE OF THE PROGRAMMED TRAFFIC SIGNAL CONTROLLER FOR REVIEW BY THE EPC DEPARTMENT OF PUBLIC WORKS, HIGHWAY DIVISION SIGNAL SHOP AND SHALL ALLOW FOR A MINIMUM TWO WEEK REVIEW PERIOD. AFTER WHICH TIME THE CONTRACTOR MAY MAKE ARRANGEMENTS FOR PICKING UP THE SIGNAL CONTROLLER.

TRAFFIC SIGNAL NOTES (CONTINUED)

8 CONTROLLER CABINETS SHALL BE FURNISHED WITH A "BEST" DOOR LOCK KIT LOCK AND CORE IS "BEST": 5L6R LEFT HAND RIGHT.

9 CONDUIT IS TO BE PLACED IN THE EVENT THAT EXISTING CONDUIT IS DAMAGED AND AS DIRECTED BY THE ENGINEER.

10 ELECTRICAL SERVICE DISCONNECT BOXES SHALL BE LOCKABLE AND WEATHER PROOF WITH THE NEMA CIRCUIT BREAKER, ENCLOSURES SHALL BE PROVIDED AT THE CONNECTION POINT OF EACH POWER SOURCE OR POINT OF SERVICE AS DIRECTED BY THE ENGINEER.

11 THE CONTRACTOR SHALL FURNISH AND INSTALL ALL WIRING REQUIRED TO COMPLETE THE INSTALLATION AND ESTABLISH THE FUNCTIONALITY OF ALL TRAFFIC SIGNAL EQUIPMENT.

12 ALL INCIDENTAL ITEMS NOT SHOWN IN THE SUMMARY OF APPROXIMATE QUANTITIES OR TABULATION OF SIGNAL EQUIPMENT SHALL BE CONSIDERED TO BE INCLUDED AS PART OF THE TRAFFIC SIGNAL INSTALLATION AND WILL NOT BE MEASURED AND PAID FOR SEPARATELY. ALL QUANTITIES ARE APPROXIMATE. THE (CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK NECESSARY TO COMPLETE THE CONSTRUCTION SHOWN ON THESE PLANS.

13 THE SIGNAL SHALL NOT BE TURNED ON OR STARTED UNTIL DIRECTED BY THE ENGINEER. PRIOR TO SIGNAL ACTIVATION, THE ENGINEER SHALL CONFIRM THAT THE APPROPRIATE PAVEMENT MARKINGS AND SIGNING ARE IN PLACE AND THAT ALL WORK NECESSARY FOR PROPER SIGNAL OPERATION HAS BEEN COMPLETED.

14 THE SIGNAL CONTROLLER SHALL BE A [illegible]70E-HC11 AND THE CONFLICT MONITOR SHALL BE A MODEL 2018. THE CONTROLLER CABINET SHALL BE A CDOT SPECIFICATION MODEL 332 THAT INCLUDES ONE FULL SIZE FRONT DOOR AND ONE FULL SIZE REAR DOOR AND SHALL CONTAIN ANTI-GRAFFITI SILVER COATING. THE CABINET SHALL BE MOUNTED ON A CAST-IN-PLACE CONCRETE FOUNDATION PER APPLICABLE CDOT'S STANDARDS STANDARD PLAN AND THE CABINET SHALL BE POSITIONED SUCH THAT, WITH THE FRONT DOOR OPEN, BOTH THE CONTROLLER DISPLAY AND THE SIGNAL INSTALLATION WILL BE VISIBLE.

15. LUMINAIRES SHALL CONSIST OF AN ASSEMBLY THAT UTILIZES LEDS AS THE LIGHT SOURCE. IN ADDITION, A COMPLETE LUMINAIRE SHALL CONSIST OF A HOUSING, LED ARRAY, AND ELECTRONIC DRIVER (POWER SUPPLY). ALL LUMINAIRES SHALL BE WIRED 240 WITH MULTI-TAP HEADS. THE LED FIXTURE MUST HAVE A COLOR TEMPERATURE OF 4100K (+/- 500K), MUST BE DESIGNED TO OPERATE AT A TEMPERATURE RANGE OF -40°F TO 105°F (-40°C TO 40°C), AND PROVIDE A MINIMUM OF 70,000 HOURS OF OPERATION. LUMINAIRES SHALL BE ~~SENSE LED STREET LIGHT~~ OR APPROVED EQUAL. THE CONTRACTOR SHALL PROVIDE A RECOMMENDATION FOR THE TYPE OF STREET LIGHT BASED ON THE CONSTRUCTION PLANS AND MANUFACTURER'S SPECIFICATIONS, TO BE APPROVED BY THE ENGINEER. THE FIXTURE MUST BE CAST ALUMINUM, PROVIDED WITH FUSING, SURGE SUPRESSION AND MUST BE UL LISTED FOR WET LOCATIONS. THE FIXTURE MUST HAVE AN INTERNAL, WEATHER-TIGHT LED DRIVE. NO ACTIVE COOLING FEATURES (FANS, ETC.) WILL BE ALLOWED. THE FINISH SHALL MATCH THE EXTENSION ARM SHAFTS. THE LUMINAIRES WILL BE INSTALLED ON 15 FOOT EXTENSION ARM SHAFTS AT A NOMINAL HEIGHT OF 40 FEET AND SHALL BE WELDED TO THE SIGNAL POLE PER CDOT TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS STAND PLAN S-614-40. LUMINAIRE ARM SHAFT PLACEMENT AND ORIENTATION SHALL BE IN ACCORDANCE WITH THE PROJECT PLANS..

16 THE INTERSECTION DETECTION SYSTEM (MICROWAVE RADAR) CONTRACT ITEM INCLUDES DEVICE INSTALLATION (I.E., DETECTOR UNIT, HARDWARE, WIRING, PROCESSOR MODULE, ETC.), AND VERIFICATION OF SUCCESSFUL IN-FIELD DETECTION ZONE OPERATION BASED ON SEVERAL VEHICLE ACTUATIONS IN ALL DETECTION ZONES.

17 THE CONTRACTOR SHALL COORDINATE THE SCHEDULES OF THE CONTRACTED PROFESSIONAL ENGINEERING CONSULTANT AND THE EPC DEPARTMENT OF PUBLIC WORKS, HIGHWAY DIVISION TRAFFIC SIGNAL STAFF FOR SCHEDULING THE ON-SITE FIELD IMPLEMENTATION OF ALL TRAFFIC SIGNAL TIMING AND OPERATIONAL PROGRAMMING, VEHICLE DETECTION ZONE PLACEMENT, AND DETECTION EQUIPMENT POSITIONING. THIS WORK SHALL BE SCHEDULED NEAR THE END OF THE PROJECT, PRIOR TO PROJECT ACCEPTANCE, AND ONLY AFTER ALL FINAL PAVEMENT MARKINGS, SIGNING, AND TRAFFIC SIGNAL WORK HAS BEEN COMPLETED.

18 THE MICROWAVE RADAR DETECTION SYSTEM SHALL UTILIZE MS SEDCO INTERSECTOR TC-CK1-SBE WITH INTERFACE BOARD)

19 PEDESTRIAN SIGNAL HEAD INSTALLATION SHALL INCLUDE ALUMINUM AND POWDER COATED GLOSS BLACK SIGNAL HEAD WITH APPROVED LED COUNTDOWN DISPLAY, ALUMINUM OPEN VISOR WITH THE OUTSIDE POWDER COATED GLOSS BLACK, PUSHBUTTON, AND INSTRUCTIONAL R10-3E COUNTDOWN PEDESTRIAN ACTUATION SIGN. PUSHBUTTON SHALL BE VANDAL-RESISTENT PIEZO DRIVEN SOLID STATE TECHNOLOGY SWITCH, BULLDOG MOMENTARY LED TYPE.

20 ALL TRAFFIC SIGNAL POLES ~~MAST ARMS, PEDESTALS,~~ AND LUMINAIRE ARMS SHALL HAVE A GLOSS BLACK COATING FINISH OVER HOT DIP GALVANIZED BASE COAT, INSTALLED IN ACCORDANCE WITH THE PAINT MANUFACTURER' S INSTRUCTIONS .

21 ALL SIGNAL POLE AND CONTROLLER LOCATIONS SHOWN ARE APPROXIMATE ONLY. ~~MAST ARMS SHALL BE OF SUFFICIENT LENGTH AND DESIGN TO ALLOW PROPER PLACEMENT OF SIGNAL HEADS AND OVERHEAD SIGNING PER THE PLANS.~~ ACTUAL LOCATIONS SHALL BE STAKED IN THE FIELD AND FIELD VERIFIED BY THE ENGINEER PRIOR TO DRILLING, EXCAVATION, AND ORDERING THE SIGNAL EQUIPMENT AND MAST ARMS, THE LOCATION OF EACH SIGNAL POLE FOUNDATION SHALL BE POTHOLED PRIOR TO DRILLING TO CONFIRM WHETHER OR NOT ANY UTILITY CONFLICTS EXIST.

TRAFFIC SIGNAL NOTES (CONTINUED)

22 LATERAL OFFSETS FROM THE NEAR EDGE OF TRAFFIC SIGNAL POLES, PEDESTALS, AND CABINETS TO THE FACE OF CURB OR THE EDGE OF A PAVED SHOULDER SHOULD BE AT LEAST SIX FEET, HOWEVER, A MINIMUM LATIERAL OFFSET OF AT LEAST FOUR FEET MAY BE PROVIDED FOR CURB OFFSETS. IF NO PAVED SHOULDER EXISTS, A MINIMUM LATERAL OFFSET OF AT LEAST EIGHT FEET SHOULD BE PROVIDED FROM THE EDGE OF PAVEMENT FOR AN AUXILIARY LANE AND A MINIMUM LATERAL OFFSET OF AT LEAST TWELVE FEET SHOULD BE PROVIDED FROM THE EDGE OF PAVEMENT FOR A THROUGH LANE.

23 SHOULD THE CONTRACTOR ENCOUNTER WATER IN THE CAISSON, ANY DE-WATERING METHODS AND NECESSARY PERMITS SHALL BE INCLUDED IN THE COST OF THE CAISSON AND WILL BE CONSIDERED INCIDENTAL TO THE WORK.

24 ALL TRAFFIC SIGNAL COMPONENT PULL BOXES SHALL BE PRE CAST HIGH DENSITY POLYMER CONCRETE (HDPC) MATERIAL WITH THE FOLLOWING SIZES: 30 INCH X 48 INCH X 18 INCH FOR THE PULL BOX ADJACENT TO THE CONTROLLER CABINET FOUNDATION AND 24 INCH X 36 INCH X 18 INCH FOR THE REMAINING PULL BOXES.

25 TRAFFIC PULL BOX LOCATIONS SHOWN IN THE PROJECT PLANS ARE APPROXIMATE. ACTUAL LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER. PULL BOXES SHALL BE FLUSH WITH THE FINISHED GROUND SURFACE AND SHALL NOT BE PLACED IN AREAS THAT ARE SUSCEPTIBLE TO WATER RUN OFF OR STANDING WATER, CONDUIT RUNS BETWEEN PULL BOXES SHALL NOT EXCEED APPROXIMATELY 200 FEET AND PULL BOXES SHALL NOT BE LOCATED IN HANDICAP RAMS, PEDESTRIAN LANDING AREAS, SIDEWALKS, PRIMARY SIDEWALK PATHS, OR ROADWAY PAVEMENT AREAS.

26 THE CONDUIT NUMBERS AND SIZES FOR TYPICAL CONDUIT RUNS INCLUDE THE FOLLOWING FOR A PERMANENT, MAST ARM SIGNAL INSTALLATION: A.) BETWEEN THE SIGNAL POLE FOUNDATION AND ADJACENT SIGNAL POLE PULL BOX: TWO (2) 2 INCH AND ONE (1) - 3 INCH; B.) BETWEEN SIGNAL POLE PULL BOXES: TWO (2) - 2 INCH AND THREE (3) - 3 INCH; C.) BETWEEN THE CONTROLLER CABINET FOUNDATION AND ADJACENT PULL BOX: THREE (3) - 2 INCH AND FOUR (4) 3 INCH; D.) BETWEEN THE SECONDARY SERVICE PEDESTAL METER FOUNDATION AND THE CONTROLLER FOUNDATION: ONE (1) - 2 INCH FOR THE ELECTRICAL SERVICE FEED.

27 ALL CONDUIT AND FITTINGS SHALL BE SCHEDULE 80 PVC AND ALL CONDUIT SHALL HAVE A PULL ROPE LEFT IN THEM WHEN CONSTRUCTION IS COMPLETED. ALL CONDUIT ENTERING THE CABINET FOUNDATION AND PULL BOXES SHALL HAVE BELL END STYLE COUPLINGS ON ALL CONDUIT ENDS.

28 ALL CONDUIT THAT IS DIRECTIONALLY BORED SHALL BE A MINIMUM OF THREE FEET BELOW THE EXISTING PAVEMENT. THIS WORK SHALL AVOID DISTURBING OR DAMAGING EXISTING FACILITIES AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROMPT RECONSTRUCTION, ALTERATION, REPAIR, OR MAINTENANCE OF THE HIGHWAY PROPERLY, AS NECESSARY, TO REPAIR ANY DAMAGE CAUSED BY THE ACCOMMODATION OF THE UTILITY, AND TO RESTORE THE HIGHWAY TO PRE-EXISTING OR BETTER CONDITIONS.

29 ALL SIGNAL CABLE SHALL BE CONTINUOUS FROM CONNECTIONS MADE IN THE HAND HOLE COMPARTMENT OF THE SIGNAL POLE BASE TO THE TERMINAL COMPARTMENT IN THE CONTROLLER CABINET AND SHALL CONTAIN NO SPLICES. EACH SIGNAL HEAD SHALL CONTAIN SEPARATE AND CONTINUOUS SIGNAL CABLE THE SIGNAL HEAD TO THE ABOVE GROUND HAND HOLE AT THE BASE OF THE SIGNAL POLE AND SHALL CONTAIN NO SPLICES.

30 A SEPARATE AND CONTINUOUS 21 CONDUCTOR CABLE SHALL RUN FROM THE CONTROLLER CABINET TO THE HAND HOLE AT EACH SIGNAL POLE AND SHALL CONTAIN NO SPLICES.

31 ALL SIGNS MOUNTED ON SIGNAL POLES, MAST ARMS ,AND PEDESTALS SHALL BE MOUNTED USING BANDING ALUMINUM CHANNELS, AND BACKING ZEES PER CDOT TYPICAL POLE MOUNT SIGN INSTALLATIONS STANDARD PLAN S-614-20, OR SIMILAR RIGID SIGN BRACING MOUNTING ASSEMBLY, AS DIRECTED BY THE ENGINEER. MAST ARM SIGNS THAT REQUIRE Z-BRACKETS SHALL BE MOUNTED ON ASTRO-STYLE BRACKETS AND RISERS. THE COST OF ALL HARDWARE, FITTING, TOOLS, AND EQUIPMENT NECESSARY FOR A COMPLETE INSTALLATION OF MAST ARM SIGNS WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.

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34 FINAL VEHICLE DETECTION ZONE PLACEMENT AND DIMENSIONS, IN ACCORDANCE WITH THE PROJECT PLANS, AND FINAL SIGNAL PROGRAMMING SHALL BE COMPLETED IN THE FIELD AND THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR COORDINATING AND SCHEDULING THIS WORK.

35 ALL VEHICLE AND PEDESTRIAN SIGNAL HEADS THAT HAVE NOT BEEN PLACED IN SERVICE SHALL BE COVERED WITH A PREFABRICATED WEATHER RESISTANT NYLON FORM FITTING SIGNAL FACE COVER MATERIAL. THE SIGNAL FACE SHALL REMAIN COMPLETELY COVERED UNTIL THE SIGNAL HEAD IS PLACED IN SERVICE AND IS FULLY FUNCTIONAL AND OPERATIONAL.

GENERAL NOTES
Bent Grass Meadows Dr./Meridian Rd.

LSC TRANSPORTATION CONSULTANTS

LSC Transportation Consultants, Inc. 2504 East Pikes Peak Avenue Colorado Springs, Colorado 80909 719/635-7300 719/635-7315 FAX

Project Manager
JEFFREY C. HODGSON, PE

REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 5/17/16
SCALE: NONE
DRAWN BY: [illegible]
JOB NO.: [illegible]
DWG: [illegible]

SHT NO. 2
OF 6

Number: 1 Author: dsdrice Subject: Text Box Date: 7/17/2020 09:08:16

(Notes 22-38 will be checked on the next review)

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:06:42

LSC Response: Noted

Number: 2 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:33:01

Number: 3 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:33:44

Number: 4 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:23:44

Number: 5 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:34:16

Number: 6 Author: dsdrice Subject: Highlight Date: 7/16/2020 16:12:08

Number: 7 Author: dsdrice Subject: Callout Date: 7/29/2020 10:49:55

Delete quote and paren

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:06:29

LSC Response: The plan has been updated

Number: 8 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:24:11

Number: 9 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:24:32

Number: 10 Author: dsdrice Subject: Highlight Date: 7/16/2020 16:20:09

Number: 11 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:25:14

Number: 12 Author: dsdrice Subject: Callout Date: 7/16/2020 16:21:24

1

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:06:26

LSC Response: The plan has been updated

Number: 13 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:25:50

Number: 14 Author: dsdrice Subject: Highlight Date: 7/16/2020 16:20:24

Number: 15 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:26:13

Number: 16 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:26:21

Number: 17 Author: dsdrice Subject: Highlight Date: 7/16/2020 16:23:36

Number: 18 Author: dsdrice Date: 7/16/2020 18:21:42

Number: 19 Author: dsdrice Date: 7/16/2020 18:21:42

Number: 20 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:26:42

Number: 21 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:26:45

Comments from page [2] 194900_Signal Plan Sheets-Cover continued on next page

GENERAL NOTES

PROJECT DESCRIPTION
TRAFFIC SIGNAL INSTALLATION, SIGNING AND MARKING AT BENT GRASS MEADOWS DRIVE AND MERIDIAN ROAD.

GENERAL NOTES

1 THE OWNER / DEVELOPER / DISTRICT SHALL CONTRACT WITH A QUALIFIED PROFESSIONAL ENGINEERING CONSULTANT FOR THE DESIGN, DEVELOPMENT, AND PROGRAMMING OF ALL TRAFFIC SIGNAL TIMING AND CONTROLLER OPERATIONAL PARAMETERS, SETTINGS, ADJUSTMENTS, AND EQUIPMENT THAT WILL ACHIEVE SATISFACTORY TRAFFIC SIGNAL OPERATION, INCLUDING ISOLATED, INDEPENDENT, FULLY-ACTUATED SIGNAL OPERATION AND SIGNAL SYSTEM COORDINATION TIMING PLANS OPERATION WITH EXISTING ADJACENT SIGNALIZED INTERSECTIONS, WHERE DOCUMENTED TO BE NECESSARY DURING VARIOUS TIMES OF THE DAY.

2 TRAFFIC SIGNAL MATERIALS AND INSTALLATION SHALL COMPLY WITH THE SPECIFICATIONS FOR THIS PROJECT, THE PROJECT SPECIAL PROVISIONS, "STATE OF COLORADO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", "COLORADO STANDARD PLANS", "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "THE NATIONAL ELECTRIC CODE", AND ALL LOCAL ORDINANCES AND REGULATIONS.

3 THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD PLAN SHEET S-614-40" TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS" ARE TO BE USED TO CONSTRUCT THIS PROJECT, EXCEPT THAT ALL POLES, ~~MAST ARMS~~ AND EQUIPMENT SHALL BE PAINTED BLACK.

4 ALL SUBMITTALS SHALL BE MADE TO EL PASO COUNTY FOR APPROVAL. OBTAIN ~~AB~~ REQUIRED PERMITS FOR THE WORK. PREPARE AND SUBMIT TRAFFIC CONTROL PLAN FOR THE WORK. CONTACT EI PASO COUNTY 96 HOURS IN ADVANCE OF BEGINNING CONSTRUCTION.

5 LOCATIONS OF ALL CONDUIT RUNS, DETECTORS, POLES, CONTROLLER CABINETS, PULL BOXES, AND FOUNDATIONS SHALL BE FIELD APPROVED BY EL PASO COUNTY. THE CONTRACTOR SHALL VERIFY POLE FOUNDATION AND ANCHOR BOLT ELEVATIONS WITH RESPECT TO TOP OF EXISTING OR FUTURE CURB AND SLOPE OF SIDEWALK PRIOR TO INSTALLATION OF ANY EQUIPMENT.

6 ALL PAVING, SIDEWALK, LANDSCAPING AND LAWN IRRIGATION SYSTEMS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED IN KIND, EQUAL TO OR EXCEEDING ORIGINAL CONDITIONS OR AS DIRECTED BY THE OWNER.

7 PAVEMENT MARKINGS ARE SHOWN FOR INFORMATION ONLY. REFER TO STRIPING PLANS FOR DETALS.

8 CONTRACTOR TO VERIFY POWER SOURCE AND COORDINATE HOOK - UP WITH ELECTRIC UTILITY PROVIDER.

9 CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

TRAFFIC SIGNAL NOTES

1 THE CONTRACTOR SHALL PROVIDE, FOR REVIEW, BY THE ENGINEER, A COMPLETE TRAFFIC SIGNAL MATERIAL SUBMITTAL PACKAGE THAT CONTAINS , All OF THE PROPOSED TRAFFIC SIGNAL EQUIPMENT, INCLUDING MATERIAL SPECIFICATIONS AND DESCRIPTIONS THAT WILL BE NECESSARY TO COMPLETE THE TRAFFIC SIGNAL WORK. THE CONTRACTOR SHALL ALLOW FOR A MINIMUM THREE WEEK SUBMITTAL REVIEW PERIOD AND SHALL NOT ORDER ANY SIGNAL EQUIPMENT UNTIL A FINAL REVIEW OF ALL SUBMITTALS HAVE BEEN COMPLETED BY THE ENGINEER AND VERIFIED BY THE CONTRACTOR.

2 FUNCTIONAL AND OPERATIONAL RESPONSIBILITY FOR ALL NEWLY INSTALLED AND EXISTING TRAFFIC SIGNAL EQUIPMENT WILL BECOME THE RESPONSIBILITY OF THE CONTRACTOR UNTIL FINAL ACCEPTANCE OF THE PROJECT. THE CONTRACTOR SHALL CONSIDER THIS WORK INCIDENTAL TO THE OTHER WORK BEING PERFORMED AND SHALL BE INCLUDED AS PART OF THE PROJECT.

3 SEE COLORADO DEPARTMENT OF TRANSPORTATION SIGNAL DETAILS FOR CONSTRUCTION/ INSTALLATION DETAILS NOT SHOWN ON THESE PLANS.

4 ALL SIGNAL EQUIPMENT REMOVED BY THE CONTRACTOR SHALL BE SALVAGED AND BECOME THE PROPERTY OF EL PASO COUNTY. THE SALVAGED EQUIPMENT SHALL BE DELIVERED AS DIRECTED BY THE ENGINEER. DELIVERY OF SIGNAL EQUIPMENT WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE WORK FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.

5 OVERHEAD STREET NAME SIGN DESIGN AND LAYOUT INFORMATION SHALL BE PER THE STREET NAME SIGN DETAILS REQUIRED IN THE PROJECT PLANS.

6 TRAFFIC SIGNS MOUNTED ON SIGNAL POLES ~~MAST ARMS, AND PEDESTALS~~ SHALL BE MOUNTED USING BANDING, ALUMINUM CHANNELS, AND BACKING ZEES PER APPLICABLE CDOT STANDARD PLANS, OR SIMILAR RIGID SIGN BRACKET MOUNTING ASSEMBLY.

7 ONCE THE PROFESSIONAL ENGINEERING CONSULTANT HAS COMPLETED ALL TRAFFIC SIGNAL CONTROLLER TIMING DEVELOPMENT AND CONTROLLER PROGRAMMING, THE CONTRACTOR WILL COORDINATE THE DELIVERY DATE OF THE PROGRAMMED TRAFFIC SIGNAL CONTROLLER FOR REVIEW BY THE EPC DEPARTMENT OF PUBLIC WORKS, HIGHWAY DIVISION SIGNAL SHOP AND SHALL ALLOW FOR A MINIMUM TWO WEEK REVIEW PERIOD. AFTER WHICH TIME THE CONTRACTOR MAY MAKE ARRANGEMENTS FOR PICKING UP THE SIGNAL CONTROLLER.

TRAFFIC SIGNAL NOTES (CONTINUED)

8 CONTROLLER CABINET SHALL BE FURNISHED WITH A "BEST" DOOR LOCK KIT LOCK AND CORE IS "BEST": 5L6R LEFT AND RIGHT.

9 CONDUIT IS TO BE REPLACED IN THE EVENT THAT EXISTING CONDUIT IS DAMAGED AND AS DIRECTED BY THE ENGINEER.

10 ELECTRICAL SERVICE DISCONNECT BOXES SHALL BE LOCKABLE AND WEATHER PROOF WITH THE NEMA TYPE CIRCUIT BREAKER, ENCLOSURES SHALL BE PROVIDED AT THE CONNECTION POINT OF EACH POWER SOURCE OR POINT OF SERVICE AS DIRECTED BY THE ENGINEER.

11 THE CONTRACTOR SHALL FURNISH AND INSTALL ALL WIRING REQUIRED TO COMPLETE THE INSTALLATION AND ESTABLISH THE FUNCTIONALITY OF ALL TRAFFIC SIGNAL EQUIPMENT.

12 ALL INCIDENTAL ITEMS NOT SHOWN IN THE SUMMARY OF APPROXIMATE QUANTITIES OR TABULATION OF SIGNAL EQUIPMENT SHALL BE CONSIDERED TO BE INCLUDED AS PART OF THE TRAFFIC SIGNAL INSTALLATION AND WILL NOT BE MEASURED AND PAID FOR SEPARATELY. ALL QUANTITIES ARE APPROXIMATE. THE (CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK NECESSARY TO COMPLETE THE CONSTRUCTION SHOWN ON THESE PLANS.

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13 THE SIGNAL SHALL NOT BE TURNED ON OR STARTED UNTIL DIRECTED BY THE ENGINEER. PRIOR TO SIGNAL ACTIVATION, THE ENGINEER SHALL CONFIRM THAT THE APPROPRIATE PAVEMENT MARKINGS AND SIGNING ARE IN PLACE AND THAT ALL WORK NECESSARY FOR PROPER SIGNAL OPERATION HAS BEEN COMPLETED.

14 THE SIGNAL CONTROLLER SHALL BE A MODEL 170E-HC11 AND THE CONFLICT MONITOR SHALL BE A MODEL 2018. THE CONTROLLER CABINET SHALL BE A CDOT SPECIFICATION MODEL 332 THAT INCLUDES ONE FULL SIZE FRONT DOOR AND ONE FULL SIZE REAR DOOR AND SHALL CONTAIN ANTI-GRAFFITI SILVER FINISH COATING. THE CABINET SHALL BE MOUNTED ON A CAST-IN-PLACE CONCRETE FOUNDATION PER APPLICABLE CDOT'S STANDARDS STANDARD PLAN AND THE (CABINET SHALL BE POSITIONED SUCH THAT, WITH THE FRONT DOOR OPEN, BOTH THE CONTROLLER DISPLAY AND THE SIGNAL INSTALLATION WILL BE VISIBLE.

15. LUMINAIRES SHALL CONSIST OF AN ASSEMBLY THAT UTILIZES LEDS AS THE LIGHT SOURCE. IN ADDITION, A COMPLETE LUMINAIRE SHALL CONSIST OF A HOUSING, LED ARRAY, AND ELECTRONIC DRIVER (POWER SUPPLY). ALL LUMINAIRES SHALL BE WIRED 240 WITH MULTI-TAP HEADS. THE LED FIXTURE MUST HAVE A COLOR TEMPERATURE OF 4100K (+/- 500K), MUST BE DESIGNED TO OPERATE AT A TEMPERATURE RANGE OF -40°F TO 105°F (-40°C TO 40°C), AND PROVIDE A MINIMUM OF 70,000 HOURS OF OPERATION. LUMINAIRES SHALL BE DALIGHT STREETSENSE LED STREET LIGHT, OR APPROVED EQUAL. THE CONTRACTOR SHALL PROVIDE A RECOMMENDATION FOR THE TYPE OF STREET LIGHT BASED ON THE CONSTRUCTION PLANS AND MANUFACTURER'S SPECIFICATIONS, TO BE APPROVED BY THE ENGINEER. THE FIXTURE MUST BE CAST ALUMINUM, PROVIDED WITH FUSING, SURGE SUPRESSION AND MUST BE UL LISTED FOR WET LOCATIONS. THE FIXTURE MUST HAVE AN INTERNAL, WEATHER-TIGHT LED DRIVE. NO ACTIVE COOLING FEATURES (FANS, ETC.) WILL BE ALLOWED. THE FINISH SHALL MATCH THE EXTENSION ARM SHAFTS. THE LUMINAIRES WILL BE INSTALLED ON 15 FOOT EXTENSION ARM SHAFTS AT A NOMINAL HEIGHT OF 40 FEET AND SHALL BE WELDED TO THE SIGNAL POLE PER CDOT TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS STAND PLAN S-614-40. LUMINAIRE ARM SHAFT PLACEMENT AND ORIENTATION SHALL BE IN ACCORDANCE WITH THE PROJECT PLANS..

16 THE INTERSECTION DETECTION SYSTEM (MICROWAVE RADAR) CONTRACT ITEM INCLUDES DEVICE INSTALLATION (I.E., DETECTOR, HARDWARE, WIRING, PROCESSOR MODULE, ETC.), AND VERIFICATION OF SUCCESSFUL INTERSECTION DETECTION ZONE OPERATION BASED ON SEVERAL VEHICLE ACTUATIONS IN ALL DETECTION ZONES.

17 THE CONTRACTOR SHALL COORDINATE THE SCHEDULES OF THE CONTRACTED PROFESSIONAL ENGINEERING CONSULTANT AND THE EPC DEPARTMENT OF PUBLIC WORKS, HIGHWAY DIVISION TRAFFIC SIGNAL STAFF FOR SCHEDULING THE ON-SITE FIELD IMPLEMENTATION OF ALL TRAFFIC SIGNAL TIMING AND OPERATIONAL PROGRAMMING, VEHICLE DETECTION ZONE PLACEMENT, AND DETECTION EQUIPMENT POSITIONING. THIS WORK SHALL BE SCHEDULED NEAR THE END OF THE PROJECT AND PRIOR TO PROJECT ACCEPTANCE, AND ONLY AFTER ALL FINAL PAVEMENT MARKINGS, SIGNING, AND TRAFFIC SIGNAL WORK HAS BEEN COMPLETED.

18 THE MICROWAVE RADAR DETECTION SYSTEM SHALL UTILIZE MS SEDCO INTERSECTOR TC-CK1-SBE WITH INTERFACE BOARD)

19 PEDESTRIAN SIGNAL HEAD INSTALLATION SHALL INCLUDE ALUMINUM AND POWDER COATED GLOSS BLACK SIGNAL HEAD WITH APPROVED LED COUNTDOWN DISPLAY, ALUMINUM OPEN VISOR WITH THE SAME POWDER COATED GLOSS BLACK, PUSHBUTTON, AND INSTRUCTIONAL R10-3E COUNTDOWN PEDESTRIAN ACTUATION SIGN. PUSHBUTTON SHALL BE VANDAL-RESISTANT, NO DRIVEN SOLID STATE TECHNOLOGY SWITCH, BULLDOG MOMENTARY LED TYPE.

20 ALL TRAFFIC SIGNAL POLES, ~~MAST ARMS, PEDESTALS,~~ AND LUMINAIRE ARMS SHALL HAVE A GLOSS BLACK COATING OVER HOT DIP GALVANIZED BASE COAT, INSTALLED IN ACCORDANCE WITH THE CURRENT MANUFACTURER' S INSTRUCTIONS .

21 ALL SIGNAL POLE AND CONTROLLER LOCATIONS SHOWN ARE APPROXIMATE ONLY. ~~MAST ARMS SHALL BE OF SUFFIRCIENT LENGTH AND DESIGN TO ALLOW PROPER PLACEMENT OF SIGNAL HEADS AND OVERHEAD SIGNING PER THE PLANS~~ ACTUAL LOCATIONS SHALL BE STAKED IN THE FIELD AND FIELD VERIFIED BY THE ENGINEER PRIOR TO DRILLING, EXCAVATION, AND ORDERING THE SIGNAL EQUIPMENT AND MAST ARMS. THE LOCATION OF EACH SIGNAL POLE FOUNDATION SHALL BE POTHOLED PRIOR TO DRILLING TO CONFIRM WHETHER OR NOT ANY UTILITY CONFLICTS EXIST.

TRAFFIC SIGNAL NOTES (CONTINUED) (Notes 22-38 will be checked on the next review)

22 LATERAL OFFSETS FROM THE NEAR EDGE OF TRAFFIC SIGNAL POLES, PEDESTALS, AND CABINETS TO THE FACE OF CURB OR THE EDGE OF A PAVED SHOULDER SHOULD BE AT LEAST SIX FEET, HOWEVER, A MINIMUM LATIERAL OFFSET OF AT LEAST FOUR FEET MAY BE PROVIDED FOR CURB OFFSETS. IF NO PAVED SHOULDER EXISTS, A MINIMUM LATERAL OFFSET OF AT LEAST EIGHT FEET SHOULD BE PROVIDED FROM THE EDGE OF PAVEMENT FOR AN AUXILIARY LANE AND A MINIMUM LATERAL OFFSET OF AT LEAST TWELVE FEET SHOULD BE PROVIDED FROM THE EDGE OF PAVEMENT FOR A THROUGH LANE.

23 SHOULD THE CONTRACTOR ENCOUNTER WATER IN THE CAISSON, ANY DE-WATERING METHODS AND NECESSARY PERMITS SHALL BE INCLUDED IN THE COST OF THE CAISSON AND WILL BE CONSIDERED INCIDENTAL TO THE WORK.

24 ALL TRAFFIC SIGNAL COMPONENT PULL BOXES SHALL BE PRE CAST HIGH DENSITY POLYMER CONCRETE (HDPC) MATERIAL WITH THE FOLLOWING SIZES: 30 INCH X 48 INCH X 18 INCH FOR THE PULL BOX ADJACENT TO THE CONTROLLER CABINET FOUNDATION AND 24 INCH X 36 INCH X 18 INCH FOR THE REMAINING PULL BOXES.

25 TRAFFIC PULL BOX LOCATIONS SHOWN IN THE PROJECT PLANS ARE APPROXIMATE. ACTUAL LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER. PULL BOXES SHALL BE FLUSH WITH THE FINISHED GROUND SURFACE AND SHALL NOT BE PLACED IN AREAS THAT ARE SUSCEPTIBLE TO WATER RUN OFF OR STANDING WATER, CONDUIT RUNS BETWEEN PULL BOXES SHALL NOT EXCEED APPROXIMATELY 200 FEET AND PULL BOXES SHALL NOT BE LOCATED IN HANDICAP RAMS, PEDESTRIAN LANDING AREAS, SIDEWALKS, PRIMARY SIDEWALK PATHS, OR ROADWAY PAVEMENT AREAS.

26 THE CONDUIT NUMBERS AND SIZES FOR TYPICAL CONDUIT RUNS INCLUDE THE FOLLOWING FOR A PERMANENT, MAST ARM SIGNAL INSTALLATION: A.) BETWEEN THE SIGNAL POLE FOUNDATION AND ADJACENT SIGNAL POLE PULL BOX: TWO (2) 2 INCH AND ONE (1) - 3 INCH; B.) BETWEEN SIGNAL POLE PULL BOXES: TWO (2) - 2 INCH AND THREE (3) - 3 INCH; C.) BETWEEN THE CONTROLLER CABINET FOUNDATION AND ADJACENT PULL BOX: THREE (3) - 2 INCH AND FOUR (4) 3 INCH; D.) BETWEEN THE SECONDARY SERVICE PEDESTAL METER FOUNDATION AND THE CONTROLLER FOUNDATION: ONE (1) - 2 INCH FOR THE ELECTRICAL SERVICE FEED.

27 ALL CONDUIT AND FITTINGS SHALL BE SCHEDULE 80 PVC AND ALL CONDUIT SHALL HAVE A PULL ROPE LEFT IN THEM WHEN CONSTRUCTION IS COMPLETED. ALL CONDUIT ENTERING THE CABINET FOUNDATION AND PULL BOXES SHALL HAVE BELL END STYLE COUPLINGS ON ALL CONDUIT ENDS.

28 ALL CONDUIT THAT IS DIRECTIONALLY BORED SHALL BE A MINIMUM OF THREE FEET BELOW THE EXISTING PAVEMENT. THIS WORK SHALL AVOID DISTURBING OR DAMAGING EXISTING FACILITIES AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROMPT RECONSTRUCTION, ALTERATION, REPAIR, OR MAINTENANCE OF THE HIGHWAY PROPERLY, AS NECESSARY. TO REPAIR ANY DAMAGE CAUSED BY THE ACCOMMODATION OF THE UTILITY, AND TO RESTORE THE HIGHWAY TO PRE-EXISTING OR BETTER CONDITIONS.

29 ALL SIGNAL CABLE SHALL BE CONTINUOUS CONNECTIONS MADE IN THE HAND HOLE COMPARTMENT OF THE SIGNAL POLE BASE TO THE TERMINAL COMPARTMENT IN THE CONTROLLER CABINET AND SHALL CONTAIN NO SPLICES. EACH SIGNAL HEAD SHALL CONTAIN SEPARATE AND CONTINUOUS SIGNAL CABLE THE SIGNAL HEAD TO THE ABOVE GROUND HAND HOLE AT THE BASE OF THE SIGNAL POLE AND SHALL CONTAIN NO SPLICES.

30 A SEPARATE AND CONTINUOUS 21 CONDUCTOR CABLE SHALL RUN FROM THE CONTROLLER CABINET TO THE HAND HOLE AT EACH SIGNAL POLE AND SHALL CONTAIN NO SPLICES.

31 ALL SIGNS MOUNTED ON SIGNAL POLES, MAST ARMS ,AND PEDESTALS SHALL BE MOUNTED USING BANDING ALUMINUM CHANNELS, AND BACKING ZEES PER CDOT TYPICAL POLE MOUNT SIGN INSTALLATIONS STANDARD PLAN S-614-20, OR SIMILAR RIGID SIGN BRACING MOUNTING ASSEMBLY, AS DIRECTED BY THE ENGINEER. MAST ARM SIGNS THAT REQUIRE Z-BRACKETS SHALL BE MOUNTED ON ASTRO-STYLE BRACKETS AND RISERS. THE COST OF ALL HARDWARE, FITTING, TOOLS, AND EQUIPMENT NECESSARY FOR A COMPLETE INSTALLATION OF MAST ARM SIGNS WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.

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GENERAL NOTES
Bent Grass Meadows Dr./Meridian Rd.

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REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 5/17/16
SCALE: NONE
DRAWN BY: JCH
JOB NO.: 15-126
DWG: 15-126 - Bent Grass Dr

SHT NO. 2
OF 6

Number: 22 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:29:06

Number: 23 Author: dsdrice Subject: Highlight Date: 7/16/2020 18:44:48

Number: 24 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:28:56

Number: 25 Author: dsdrice Subject: Highlight Date: 7/16/2020 18:44:51

Number: 26 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:29:26

Number: 27 Author: dsdrice Subject: Highlight Date: 7/16/2020 18:49:03

Number: 28 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:30:02

Number: 29 Author: dsdrice Subject: Highlight Date: 7/16/2020 18:50:23

Number: 30 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:30:18

Number: 31 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:30:59

Number: 32 Author: dsdrice Subject: Highlight Date: 7/16/2020 18:51:06

Number: 33 Author: dsdrice Subject: Highlight Date: 7/16/2020 15:32:26

Number: 34 Author: dsdrice Subject: Highlight Date: 7/16/2020 18:53:04

GENERAL NOTES (CONT.)

TRAFFIC SIGNAL NOTES (CONTINUED)

36 ALL DETECTION EQUIPMENT, DETECTION ZONES, AND SIGNAL TIMING OPERATION SHALL BE CONFIRMED IN THE FIELD BY THE CONTRACTED PROFESSIONAL ENGINEERING CONSULTANT TO BE ACHIEVING SATISFACTORY TRAFFIC SIGNAL OPERATION.

37 RADIO TELEMETRY AND COMMUNICATION SYSTEM SHALL CONSIST OF A FREEWAVE HT-PE ETHERNET 900 MHZ RADIO TRANSMITTER/RECEIVER, PCTEL BLUEWAVE YAGI ANTENNA (890-960 MHZ, 6.5 DBD GAIN), BLUEWAVE SENTINEL SURGE SUPPRESSOR, AND ALL REQUIRED HARDWARE, AND WIRING. THE RADIO SHALL MEET THE FOLLOWING SPECIFICATIONS:

TRANSMITTER:
- FREQUENCY RANGE - 902 TO 928 MHZ (FHSS/FCC DTS)
- OUTPUT POWER - 5 MW TO 870 MW
- DATA LINK RANGE - 15 MILES, CLEAR LOS, HIGH SPEED
- MODULATION - 2 LEVEL GFSK
- RF DATA RATE - 614 KBPS STANDARD SPEED - 867 KBPS AT HIGH SPEED
- OCCUPIED BANDWIDTH - 611.2 KHZ
- HOPPING PATTERNS - 15 PER BAND, 105 TOTAL, USER-SELECTABLE
- HOPPING CHANNELS - 41
- FREQUENCY ZONES - 16 ZONES, 2-3 CHANNELS PER ZONE

RECEIVER:
- SENSITIVITY: -102DBM FOR BER 10-6 AT 614 KBPS; -96 DBM FOR BER 10-6 AT 867 KBPS

DATA TRANSMISSION:
- ERROR DETECTION: 32 BIT CRC, RETRANSMIT ON ERROR
- DATA SECURITY: AES 128 BIT ENCRYPTION FHSS TECHNOLOGY RADIUS
- SERIAL INTERFACE: RS232/RS422/RS485, PROGRAMMABLE; RJ-45 CONNECTORS
- ETHERNET INTERFACE: 802.3, IPV4, TCP, UDP, ICMP, ARP, MULTICAST, TFTP, DNP3 OVER TCP, VLAN, (2) 802.3U, FAST ETHERNET, RJ-45

POWER REQUIREMENTS:
- OPERATING VOLTAGE: +6 VDC TO +30 VDC

TYPICAL POWER: TRANSMIT: 6.6 W RECEIVE: 1.7 W - IDLE: 0.8 W

38 THE CONTRACTED PROFESSIONAL ENGINEERING TRAFFIC SIGNAL TIMING, CONTROLLER PROGRAMMING AND OPERATION, AND OVERALL TRAFFIC SIGNAL OPERATIONAL CONSULTANT SERVICES THAT ARE TO BE RETAINED BY THE OWNER / DEVELOPER / DISTRICT SHALL INCLUDE, BUT NOT BE LIMITED TO:

A. DEVELOPING ALL TRAFFIC SIGNAL TIMING AND OPERATIONAL PARAMETERS FOR ACHIEVING ISOLATED, FULL-ACTUATED VEHICLE AND PEDESTRIAN INTERSECTION OPERATION AND, WHEN DOCUMENTED TO BE NECESSARY, COORDINATED SIGNAL SYSTEM TIMING PLAN OPERATION DURING VARIOUS TIMES OF THE DAY,
B. PROGRAMMING ALL SIGNAL TIMING PARAMETERS INTO THE TRAFFIC SIGNAL CONTROLLER,
C. FIELD IMPLEMENTING AND FINE-TUNING / ADJUSTING ALL TRAFFIC SIGNAL TIMING PARAMETERS, INCLUDING FOLLOW-UP FIELD REVIEWS AS MAY BE NECESSARY,
D. DEVELOPING, PROGRAMMING, FIELD IMPLEMENTING, AND FINE-TUNING ALL VEHICLE DETECTION ZONE DIMENSIONS, ZONE LOCATIONS, AND OPERATIONAL PARAMETERS.

ALL OF THE AFOREMENTIONED CONTRACTED PROFESSIONAL ENGINEERING TRAFFIC SIGNAL OPERATIONAL CONSULTANT SERVICES DELIVERABLES SHALL BE CONSISTENT WITH NATIONAL PUBLICATIONS, INCLUDING, BUT NOT LIMITED TO: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) LATEST EDITION / REVISION, FHWA-HOP-08-024 "TRAFFIC SIGNAL TIMING MANUAL" (JUNE 2008), FHWA-HRT-04-091 "SIGNALIZED INTERSECTIONS: INFORMATIONAL GUIDE" (AUGUST 2004), FHWA-HOP-06-006 "TRAFFIC CONTROL SYSTEMS HANDBOOK" (OCTOBER 2005), FHWA-DTFH61-01-C-00183 "SIGNAL TIMING PROCESS FINAL REPORT" (DECEMBER 2003), NCHRP REPORT 731 "GUIDELINES FOR TIMING YELLOW AND ALL-RED INTERVALS AT SIGNALIZED INTERSECTIONS" (2012), NCHRP REPORT 812 "SIGNAL TIMING MANUAL SECOND EDITION" (2015)

SIGNING AND STRIPING NOTES

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE "D" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4" UPPER-LOWER CASE LETTERING ON 8" BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6" LETTERING, UPPER-LOWER CASE ON 12" BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8" UPPER-LOWER CASE LETTERING ON 18" BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75" X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100" MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24" IN WIDTH. CROSSWALKS LINES SHALL BE 12" WIDE AND 8' LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY DEVELOPMENT SERVICES (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY PUBLIC WORKS SERVICE DEPARTMENT (719) 520-6460 PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY RIGHT OF WAY.

PCD 2

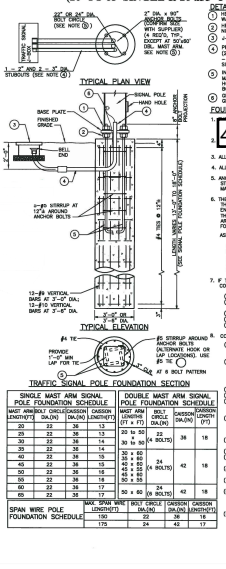
7 8

DPW 9

Works 10

CITY OF COLORADO SPRINGS TRAFFIC SPAN WIRE TRAFFIC SIGNAL FOUNDATION SPECIFICATIONS

13.14 TRAFFIC SIGNAL FOUNDATION (TYPICAL) (20' TO 65' SINGLE & 20'x35' TO 50'x60' DOUBLE MAST ARMS



DETAIL NOTES

1. HEAVY HEX NUTS & FLAT WASHER.
2. HEAVY HEX LEVELING NUTS & WASHERS
3. J-BOX
4. PROVIDE ONE (1) – 3" DIAMETER SCHEDULE 40 PVC CONDUIT (24" MIN. DEPTH, 30" MIN. DEPTH UNDER ROADWAY) & TWO (2) – 3" DIAMETER SCHEDULE 40 PVC CONDUITS TO THE TRAFFIC SIGNAL J-BOX. INSTALL BELL ENDS ON EACH CONDUIT.
5. INSTALL ANCHOR BOLTS (FURNISHED WITH POLE) PER MANUFACTURER'S TEMPLATE (FURNISHED WITH ORDER). ORIENT TEMPLATE TO ALLOW CONCRETE PUMP HOSE CAN ACCESS THE BOTTOM OF THE EXCAVATION.
6. GROUNDING NUT. SEE SECTION 13.12 FOR INFORMATION ON GROUNDING REQUIREMENTS.

FOUNDATION DESIGN AND CONSTRUCTION NOTES

1. THE TRAFFIC SIGNAL FOUNDATIONS SHOWN ON THIS DRAWING SHALL BE USED WITH THE CITY OF COLORADO SPRINGS STANDARD PLANS, AS DEVELOPED BY VULCAN INDUSTRIES.
2. WORK SHALL BE IN ACCORDANCE WITH THE COLORADO SPRINGS TRAFFIC SIGNAL INSTALLATION AND PARTS SPECIFICATIONS.
3. ALL CAISSON CONCRETE SHALL BE CDOT CLASS B2, f'_c = 4000 psi.
4. ALL REINFORCING STEEL SHALL BE GRADE 60, fy = 60,000 psi.
5. ANCHOR BOLTS SHALL BE ASTM F1554 MODIFIED TO 55 ksi YIELD STRENGTH. ANCHOR BOLTS SHALL BE FURNISHED BY SIGNAL POLE MANUFACTURER.
6. THE SIGNAL FOUNDATION DESIGN SHOWN ON THIS DRAWING ASSUMES THE ASSUMED SOIL CHARACTERISTICS AS SHOWN BY TYPICAL SOILS ENCOUNTERED IN COLORADO SPRINGS WHICH ARE NOTED BELOW. IN THE EVENT THAT POOR SOIL CONDITIONS (A SLOW COUNT OF N<30) ARE ENCOUNTERED, A SITE SPECIFIC GEOTECHNICAL EVALUATION AND FOUNDATION DESIGN WILL BE NECESSARY.

   ASSUMED GEOTECHNICAL DESIGN PARAMETERS:

   SOIL DENSITY (?) = 120 pcf
   COHESION (c) = 0 psf
   ANGLE OF INTERNAL FRICTION (ϕ) = 28°
   HORIZONTAL MODULUS OF SUBGRADE REACTION (k) = 77 tcf
   f_{cp} = 0.01 in/in
7. IF THE FOLLOWING CONDITIONS ARE ENCOUNTERED DURING DRILLING, CONTACT THE COLORADO SPRINGS ENGINEER:
   (A) SIGNAL POLE MUST BE INSTALLED WITHIN THE ROADWAY PRISM.
   (B) THE SOIL CONTAINS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
   (C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
   (D) THE FOUNDATION SOILS ARE NOT HOMOGENEOUS.
   (E) FIRM BEDROCK IS ENCOUNTERED.
8. CONSTRUCTION NOTES:
   (A) PRIOR TO POURING CONCRETE, ANCHOR BOLT THREADS SHALL BE OILED. BOLT POSITIONS SHALL BE ACCURATE TO ±1/8"/+/-. BOLTS SHALL BE ACCURATELY SQUARE WITH CURB LINE.
   (B) PRIOR TO POURING CONCRETE, CONDUITS SHALL BE TAPED. CONDUIT ORIENTATIONS ARE TO BE DETERMINED BY THE TRAFFIC SIGNAL ENGINEER. ORIENTATIONS WHERE CONDUIT RUNS ON TOP OF THE CONCRETE BASE, MARKS SHOULD BE 2" FROM THE PERIMETER OF THE BASE.
   (C) CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH.
   (D) CONCRETE SHALL BE VIBRATED.
   (E) A MINIMUM OF 3" CONCRETE COVER SHALL BE MAINTAINED BETWEEN THE CONDUIT STUBS. A MINIMUM OF 4" OF COVER IS ALLOWED AT THE TOP OF THE CAISSON.
   (F) ALL CONDUIT STUBS SHALL EXTEND FREELY BEYOND THE POUR AND SHALL BE FITTED WITH A COUPLING ON EACH STUB. STUBS SHALL BE TAPED TO PREVENT ENTRY OF DIRT OR CONCRETE.
   (G) LOOSE DIRT SHALL BE REMOVED FROM THE BOTTOM OF THE HOLE PRIOR TO POURING CONCRETE.
   (H) TRASH SHALL NOT BE THROWN INTO THE HOLE.
   (I) THE BASE SURFACE SHALL BE SMOOTH FINISHED WITH A STEEL TROWEL. ROUGH BASE SURFACES ARE NOT ALLOWED.
   (J) THE BASE TOP SHALL BE FLUSH TO SIDEWALK GRADE OR, IF NO ATTACHED TO SIDEWALK, 1" ABOVE GRADE.
   (K) NO COLD JOINTS ARE ALLOWED IN CAISSONS. POUR CAISSONS CONTINUOUSLY TO FINISHED GRADE.
   (L) CAISSON DIMENSIONS, BOLT CIRCLE, DEPTH AND/OR DIAMETER, AS APPROVED BY THE CITY'S TRAFFIC ENGINEER. THE CITY SHALL APPROVE MODIFICATIONS NEEDED FOR THE CAISSONS DUE TO UNFORESEEN CONDITIONS.
   (M) BASE DIMENSIONS AND BOLT CIRCLE PATTERN MAY BE CHANGED, BUT ONLY UPON APPROVAL BY THE CITY TRAFFIC ENGINEER.

SINGLE MAST ARM SIGNAL POLE FOUNDATION SCHEDULE

MAST ARM LENGTH(FT)	BOLT CIRCLE DIA.(IN)	CAISSON DIA.(IN)	CAISSON LENGTH(FT)
20	22	36	13
25	22	36	13
30	22	36	14
35	22	36	14
40	22	36	15
45	22	36	15
50	22	36	16
55	22	36	16
60	22	36	17
65	22	36	17

SPAN WIRE POLE FOUNDATION SCHEDULE

MAX. SPAN WIRE LENGTH(FT)	BOLT CIRCLE DIA.(IN)	CAISSON DIA.(IN)	CAISSON LENGTH(FT)
150	22	36	16
175	24	42	17

DOUBLE MAST ARM SIGNAL POLE FOUNDATION SCHEDULE

MAST ARM LENGTHS (FT x FT)	BOLT CIRCLE DIA.(IN)	CAISSON DIA.(IN)	CAISSON LENGTH (FT)
20 to 50 x 20 to 50	22 (4 BOLTS)	36	18
30 to 60 x 30 to 60	24 (4 BOLTS)	42	18
35 to 60 x 35 to 60	24 (6 BOLTS)	42	18

Verify no conflicts with EPC notes / CDOT specs. 3 4

5

11

GENERAL NOTES
Bent Grass Meadows Dr./Meridian Rd.

LSC TRANSPORTATION CONSULTANTS, INC.
6300 S. Zang Road, Aurora, CO 80016
Phone: 303-789-1068 Fax: 303-789-1072

Project Manager
JEFFREY C. HODGSON, PE

REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 3/17/16
SCALE: N.T.S.
DRAWN BY: MR
JOB NO.: 154.001
DWG: 154500_Signal Plan Sheet

SHT NO. 3
OF 6

Page: [4] 194900_Signal Plan Sheets-General Notes 2

Number: 1 Author: dsdrice Date: 7/16/2020 16:29:04
DEVELOPMENT SERVICE

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:07:06
LSC Response: The plan has been updated

Number: 2 Author: dsdrice Subject: Callout Date: 7/16/2020 16:30:41
PCD

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:07:09
LSC Response: The plan has been updated

Number: 3 Author: dsdrice Subject: Callout Date: 7/16/2020 16:41:03
Verify no conflicts with EPC notes / CDOT specs.

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:07:34
LSC Response: The plan has been updated to reference CDOT Specs

Number: 4 Author: dsdrice Date: 7/16/2020 16:40:19

Number: 5 Author: dsdrice Date: 7/16/2020 16:39:11

Number: 6 Author: dsdrice Date: 7/16/2020 16:31:33
DEVELOPMENT SERVICES

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:08:23
LSC Response: The plan has been updated

Number: 7 Author: dsdrice Date: 7/16/2020 16:31:05
SERVICE

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:08:28
LSC Response: The plan has been updated

Number: 8 Author: dsdrice Date: 7/16/2020 16:31:22
PSD

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:08:34
LSC Response: The plan has been updated

Number: 9 Author: dsdrice Subject: Callout Date: 7/16/2020 16:31:49
DPW

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:08:37
LSC Response: The plan has been updated

Number: 10 Author: dsdrice Subject: Callout Date: 7/16/2020 16:31:53
Works

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:08:40
LSC Response: The plan has been updated

Number: 11 Author: dsdrice Date: 7/16/2020 16:41:22

Verify no conflicts with EPC notes / CDOT specs (not reviewed in detail by Staff) 1

GENERAL NOTES (CONT.)

This Page shows applicable notes from the Colorado Springs City Traffic Signal Installation and Parts Specification (10/10/2018)

2.8 Concrete to be State Class B2 poured against virgin (undisturbed) soil. All bases shall be vibrated to eliminate air pockets. A copy of signed batch ticket must accompany billing.

2.9 Signal foundations shall be finished with stubout directions scribed at edge. (See Fig.1-3)

2.10 Contractor shall contact the Traffic Engineer, or Designee, for inspection of form, bolts and stub out layout 24 hours prior to intent of pour, and (2-hour minimum conformation) prior to pouring concrete. **(Pouring a base without an inspection may result in contractor's immediate removal of base and installation of a new one at contractor expense).** Exposed bolt threads and nuts shall be free of concrete and debris. Only 1" of thread exposed between caisson and bottom anchor bolt nut.

2.11 Contractor must supply verification of pole data when furnishing poles.

4.6 **OVERHEAD SIGNAL WIRING**- A service drip loop shall be provided at the signal head in the individual head's feed cable. This loop shall be 2 coils of cable 12 inches in diameter and taped to the main cable at the top. Slack in the main cable shall be pulled out and the cable taped to the span wire grips at ends of the span with 2" electrical tape. Drip loop shall be provided next to the poles for the overhead cables. These loops also shall be about 12 inches in diameter and also taped to span wire grips. **Always wire the inside head as if it would have a left turn movement, i.e., use a 7-conductor.**

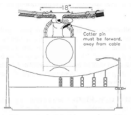
4.8 **CABLE SUPPORT RINGS**-All cable support rings shall be 18" apart.

4.9 Cables entering signal pole shall have the smaller cables lay on top of the heavier cables. Drilled hole in pole shall be deburred with file to remove sharp edges. 3" chase nipples shall be used where the wires enter the span poles. 3" Lock ring shall be installed on the outside of pole.

4.10 **HANGING HEAD**- Heads shall be installed at a minimum of 17 feet from street to the bottom of the tether clamp. Heads should be installed with each head attached to the tether. Tether shall look level across the bottom of all heads from one side to the other. Pole mount and Ped head equipment must be bolted onto signal poles. Banding type ASTRO-BRAC assembly or approved equivalent shall attach heads to the mast-arm.

4.12 **OVERHEAD SIGNS**-Overhead signs such as lane usage or school crossing signs hung on span and tether shall be installed with a minimum of 2 vertical supports. Each support shall be attached to both span and tether. Each sign support shall be made of aluminum medium extrusion, or large corner angle extrusion channels. Signs are bolted to each vertical channel using 4 lip-lock bolts. Flat backing plate must be used with each span wire clip.
All signs that are greater than 30" wide shall be mounted with a Astro type bracket on the pole or mast arm.

5.0 **Span Wire Profile (Typical standard)**



10.1 **GENERAL**-Poles shall consist of tapered pole, round, curved tapered traffic signal mast arm (if required), luminaries arm, hand hole covers, anchor bolts, washers / nuts for anchor bolts and base plate. Traffic signal poles, lighting poles, pedestals, mast arms, luminaire arms shall be of the general configuration shown in the City's Traffic Signal Standard Drawings. Pole should be designed to accommodate the minimum loads as shown on the standard plan drawing.

10.2 **CALCULATIONS**- Calculations and detailed drawings shall include mast arm, luminaries arm, pole, base plate, and anchor bolt analysis. Maximum loads and stresses shall be determined for the most critical wind direction. The pole shall be analyzed in its final deflected position, at the arm to pole connection(s) and pole base. Maximum arm and pole loads, stresses and combined stress ratios (CSR) shall be provided for the specified loading combinations, as well as maximum top of pole dead load rotation. Shaft dimensions shall be equivalent in strength for the loads shown on the drawings.

10.3 **POLE**-The pole shall be fabricated from coil or plate conforming to ASTM A572 or A595 Grade A with a minimum yield strength of 55 ksi, and have a constant linear taper of 0.14 in/ft. The shaft shall be one piece, and contain no circumferential welded butt splices. Laminated tubes are not permitted. The pole shall have a reinforced 6.50" x 10.0" handhole with cover located 1-6" from the pole base. Each pole shall be provided with a decorative end cap secured in place with setscrews. The pole shall be anodized black.

10.5 **BASE PLATE**-Base plates shall conform to ASTM A36 or ASTM A572. Plates shall be integrally welded to the tubes with a telescopic joint or a full penetration weld joint with a backed ring and is hot dip galvanized and powder coated as specified in the contract documents.

10.6 **ANCHOR BOLTS**- Anchor bolts shall conform to the requirements of ASTM F1554. The upper 12" of the bolts shall be hot dip galvanized per ASTM A153. Each anchor bolt shall be supplied with two hex nuts and two flat washers. The strength of the nuts shall equal or exceed the proof load of the bolts. A decorative cast aluminum nut cover shall be provided for each anchor bolt. Each nut cover shall be attached to the pole with a 0.25" stainless steel, self- tapping, hex head screw.

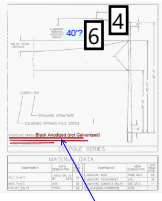
10.7 **DESIGN**-Design shall be in accordance with the 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals." Calculations and detailed drawings shall be submitted demonstrating compliance with the AASHTO specification.

10.8 **FABRICATOR**- The Fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required prior to bid opening to ensure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality Traffic Pole Structures.

10.9 **WELDING**-All welding shall be in accordance with Sections 1 through 8 of the American Welding Society (AWS) D1.1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt-welded pole and arm splices shall be ultrasonically or radiographically inspected.

10.10 **MATERIAL CERTIFICATIONS**-All materials and products shall be manufactured in the United States of America, and comply with ASTM or AASHTO specifications. Mill certifications shall be supplied as proof of compliance with the specifications.

11.0 Typical Traffic Signal Standards.



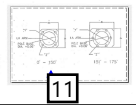
11.1 POLE DATA

TABLE 1
TAPERED ROUND POLES

Pole Type	Pole Dia. Top (in)	Pole Dia. Bot. (in)	Pole Length (FT)	Pole Wall Thickness Top (in)	Pole Wall Thickness Bot. (in)	Pole Weight Cuts (lb)	Pole Weight Lbs/FT (lb)	Anchor Bolt Dia. (in)	Anchor Bolt Circle (in)	Anchor Bolt Length (in)
30'-1"	10.00	15.00	31.00	0.250	0.375 (0.344 Min)	13.00	1.00	0.500	12.00	30.00
35'-1"	10.00	15.00	36.00	0.250	0.375 (0.344 Min)	14.00	1.00	0.500	12.00	30.00

(1) Pole cutout shall include hand hole covers, with stainless steel, anchor bolts, nuts & washers. The large Span poles (35'-175' require 6 anchor bolts per design).

7

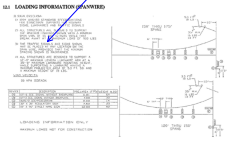


Same as gloss black? 12

Verify legibility when printed 2

All Poles ordered shall include hand hole covers, cable clamp collars, anchor bolt, nuts & washers. The large Span poles (151'-175' require 6 anchor bolts per design).

11.1 **LOADING INFORMATION (IN WRITED)**



DESIGN CRITERIA:

1) 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS
2) ALL STRUCTURES ARE DESIGNED TO SUPPORT THE MAXIMUM LOADINGS SHOWN WITH A MINIMUM SPAN WIRE OF 5% AND TETHERS WIRES THAT BREAK AWAY AT A MAXIMUM LOAD OF 900 LBS.
3) THE TRAFFIC SIGNALS AND SIGNS SHOWN MAY BE PLACED AT ANY LOCATION ON THE SPAN WIRE, PROVIDED THAT THE MINIMUM SPACING SHOWN IS MAINTAINED.
4) ALL STRUCTURES ARE DESIGNED TO SUPPORT A 12' - 0" MAXIMUM LENGTH LUMINAIRE ARM AT A 35' - 0" MAXIMUM LUMINAIRE MOUNTING HEIGHT, WHILE SUPPORTING A LUMINAIRE HAVING A MAXIMUM PROJECTED AREA OF 5.3 FT. SQ. AND A MAXIMUM WEIGHT OF 18 LBS.

WIND VELOCITY:
80 MPH ISOTACH.

LOADING INFORMATION ONLY

MAXIMUM LOADS NOT FOR CONSTRUCTION

13.0 TRAFFIC SIGNAL FOUNDATIONS

13.1 Foundation General notes:

13.2 Concrete = class B2. Reinforced steel per ASTM A615 specification, grade 60 for all bars.

13.3 Shaft for concrete foundation to be drilled by mechanical auger .

13.4 Foundation design requires that the shaft be founded in compact sand, clay, or sandy clay. If by visual inspection of the hole other material is present, the foundation design shall be modified as determined by the engineer.

13.5 Concrete shall be poured in lifts not exceeding 3 feet in depth. At the pouring of each lift, concrete shall be mechanically vibrated to remove air pockets.

13.6 Foundation shall be poured 7 to 10 days in advance of pole installation.

13.7 When ambient temperature is below (40 deg F) poured foundations shall be covered with blankets and/or straw per direction of the Engineer.

13.8 Foundation shall be poured monolithic to finished grade-(No cold joints).

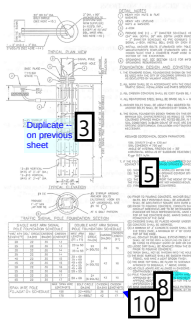
13.9 All anchor bolts shall be ASTM F1554 Grade 55.

13.10 Foundation depths vary, per the standard sheet.

13.11 Grounding Details. Refer to "**City of Colorado Springs Traffic Signal Grounding Methods**" manual for greater details. Manual is located on City web site: Springsgov.com/City engineering/Reference Materials/Standard Specifications & Traffic Manuals.
13.11.1 Equipment Grounding Conductor (EGC) Use at least 10 gauge, insulated, green, stranded copper. Refer to "City of Colorado Springs Traffic Signal Grounding Methods" manual.
13.11.2 Ground pole using UFER grounding electrode conductor (GEC)- at least 6gauge, Bare, stranded copper.
13.11.3 Connect to rebar cage of concrete foundation using clamp suitable for submersion in concrete.

13.12 Contractor shall install j-boxes next to each signal pole foundation when required.

13.13 Traffic Signal Foundations-(Typical).



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18.0 **SPECIFICATIONS FOR WIRE**

18.1 **PPB-Paired Cable-Tray cable** shall be equivalent to IMSA specification 19-1. Cable shall be minimum 6 conductors of 18 AWG. Cable shall be black PVC jacketed (.020 inches) overall with polyethylene insulation. Cable shall be shipped on sturdy wooden spools of 1,000 non-interrupted feet. Cable shall be equipped with a ripcord.

18.2 **Signal Cables**; shall comply with IMSA specification 19-1. Conductors are to be 14 AWG, comprised of no less than 7 strands and will be untinned. Conductor insulation shall be polyethylene. The cable jacket shall be of polyvinyl chloride only, and may not be unduly rigid. Tracer colors shall be painted onto the wire insulation but must be unremovable and a spiral design is preferred. Cable shall be shipped 1,000 non-interrupted feet on spools. Larger shall be approved by installer or signal supervisor. Spools shall be sturdy and constructed of wood. Spools shall be non-returnable. Cable shall be equipped with a ripcord.

19.0 **GALVANIZED STEEL CABLE**

19.1 Cable is to be comprised of seven (7) strands of galvanized steel wire of gauge required to bring outside nominal diameter to specifications. Galvanizing must be class "A" (.9 oz. zinc per square foot) and each wire must be individually galvanized prior to cable assembly. Steel cable is to be Siemans-Martin Grade and minimum breaking strengths are to be:
(3/16" 2,200 pounds)
(1/2" 12,100 pounds)

19.2 Cable is to meet ASTM A475 Specifications. Cable shall be shipped on sturdy, non-returnable spools of 1,000 feet each; coils of wire not on spools shall be unacceptable.

20.0 **TRAFFIC SIGNALS ACCESSORIES**-

20.1 CONDUIT RUNNING THREAD-1 ½" x 3' Galvanized steel or aluminum conduit running thread (NPSM) used to space between top of signal head and entrance fittings attached to the ½" span wire.

20.2 STRAND VISES-1/2" with long bale (Reliable #5254). To be used for ½", 7 strand galvanized steel cable.

20.3 3/16" with long bale (Reliable #5199). To be used for 3/16", 7 strand galvanized steel cable.

20.4 NOTE: Strand Vises to be attached to pole using supplied collars from manufacturer for span cables. One 5/8" Thimble eye bolts shall be used for each terther strand vise.

20.5 Typical attachment points for span wire connections. (½" strand vises to clamp on collars).

25.0 **Break-away tether assembly (Pelco SE-5058-PNC)**

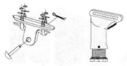
25.1 Consists of cast aluminum threaded assembly to fit bottom of signal head. Assembly unit shall have single stud for tightening.

26.0 **ENTRANCE FITTING/SIGNAL HEAD HANGERS**

26.1 Entrance fitting is a casting that couples to signal head to lower end and has a drilled rib at top to connect to cable suspension clamp. Rib is to have a series of holes beginning at centerline of signal head connector to allow for correct positioning of off-balance signal head assemblies. Pinholes are to be designed for 5/8" pin. Rib shall not be more than .625 in thickness. Integral path for wire shall be free of sharp edges and constrictions and shall have a plastic bushing at its head. Threads in entrance fitting shall also be 1 ½" NPSM. Fitting shall have 5/16" NC set screw inside to prevent chase nipple loosening. Bottom of entrance fitting shall either bear serration's for standard 72 position signal grip or shall be equipped with locking washer bearing standard 72 position signal grip. **Shurlock rings shall be constructed out of metal or aluminum. Plastic shurlock rings shall not be used.** Chase nipple shall be grooved and shall include O_Ring to seal signal head. Both entrance fitting and chase nipple shall be malleable iron and shall be painted **gloss black**.

27.0 **SPECIFICATIONS FOR SUSPENSION CLAMPS**

27.1 Suspension clamps shall be at least 7 inches long and is to be of malleable iron. Clamp and pin shall be galvanized (Class "A", .9 oz. zinc per square foot). Hole drilled in tangs for pin shall be 5/8" and 5/8" pin shall be supplied. Width between tangs shall be .70" +/- .025". Clamp bolts shall be "U" bolts with four (4) nuts and washers. "U" bolts, nuts, and lock washers shall be cadium plated. 5/8" pin shall be drilled for minimum 1/8" diameter cotter pin, which shall be, supplied cadium plated. Minimum ultimate strength shall be 16,000 pounds. Clamp is to be usable on either 3/8" or ½" stranded steel cable.b Enterance fittings shall accept City of Colorado Springs standard all thread stock.



28.0 **UPPER ARM ASSEMBLY (Pelco SE-5061-P)**

28.1 Upper Arm Assembly must be used to mount five section left turn heads in a span wire configuration. This unit shall be universal to all signal heads with a 1 ½" serrate for Standard 72 position signal grip. Grip is to be compatible with Eagle Brand Signal Heads. Unit shall be complete as shown. Unit shall be metal and painted to specified color. **Upper arm assembly shall not be constructed of 1 1/2' conduits with set screws.**

29.0 **SINGLE HEAD-Side of pole Mounts**

29.1 This bracket consists of a 1 ½" pipe nipple with an elbow at its end and a nipple and nut to retain the signal head. The pipe nipples are to be 1 ½" cast aluminum with 1 ½" NPSM threads. The nuts are to be hexagonal, 2 9/16" across the flats, threaded 1 ½" NPSM, and shall be constructed of cast aluminum. One nut shall be supplied for each nipple of the bracket. Conduit lock rings or nuts or chase nipples requiring special tools are not acceptable. The minimum overall length of the arm should be 12" c/c including hub. The elbows shall be cast aluminum, threaded 1 ½" NPSM and will have set screws to lock in place. The elbows shall be cast with serration's to position the head, or washers with serration's are to be supplied. Serrations are to be compatible with 72-position serrations on Eagle Brand signal heads. Brackets are to be shipped assembled and are to be painted. Each pair of brackets is considered a unit, as it requires two (2) for each mounting.

30.0 **POLE MOUNT FITTINGS** (BANDIT BRACKETS-Hub Plate)

30.1 Fittings to be cast aluminum, painted **gloss black**, with guides for 1" or ¾" steel bands. Radius of standard bracket to accommodate large diameter poles. Single threaded hub to be 1 ½" NPSM, threaded completely through. Guides shall be drilled with a ½" hole for mounting the bandit bracket with 3/8" bolts.

GENERAL NOTES
Bent Grass Meadows Dr./Meridian Rd.

LSC TRANSPORTATION CONSULTANTS, INC.

102 S. Tejon, Pres. Ave. Suite 310 Colorado Springs, Co. 80903
TELEPHONE: 719.633.2868 FAX: 719.633.5450

Project Manager
JEFFREY C. HODGSON, PE

REVISIONS	DATE
Revisions #3	5/5/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 3/17/16
SCALE: N.T.S.
DRAWN BY: MR
JOB NO.: Flatiron
DWG: 154690_Signal Plan Sheet

SHT NO. 4
OF 6

Page: [5] 194900_Signal Plan Sheets-General Notes 3

Number: 1 Author: dsdrice Subject: Text Box Date: 7/16/2020 16:43:30

Verify no conflicts with EPC notes / CDOT specs (not reviewed in detail by Staff)

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:09:37

LSC Response: The plan has been updated to reference CDOT Specs

Number: 2 Author: dsdrice Subject: Callout Date: 7/16/2020 16:38:37

Verify legibility when printed

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:09:26

LSC Response: The plan has been updated to reference CDOT Specs, this image has been removed

Number: 3 Author: dsdrice Subject: Text Box Date: 7/16/2020 16:51:02

Duplicate -- on previous sheet

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:09:30

LSC Response: The plan has been updated to reference CDOT Specs, this image has been removed

Number: 4 Author: dsdrice Subject: Highlight Date: 7/16/2020 16:49:27

Number: 5 Author: dsdrice Date: 7/15/2020 14:42:14

Number: 6 Author: dsdrice Subject: Text Box Date: 7/16/2020 16:49:18

40'?

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:12:58

LSC Response: The plan has been updated to reference CDOT Specs

Number: 7 Author: dsdrice Subject: Arrow Date: 7/15/2020 18:08:24

Number: 8 Author: dsdrice Date: 7/15/2020 18:10:08

Number: 9 Author: dsdrice Date: 7/15/2020 18:10:12

Number: 10 Author: dsdrice Subject: Arrow Date: 7/15/2020 18:09:43

Number: 11 Author: dsdrice Subject: Arrow Date: 7/16/2020 16:50:29

Number: 12 Author: dsdrice Subject: Callout Date: 7/16/2020 18:51:56

Same as gloss black?

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:13:02

LSC Response: The plan has been updated to reference CDOT Specs

STREET NAME SIGNS

A Meridian Rd

B Bent Grass Meadows Dr

Sign details to be included with shop drawing submittals

LEGEND

ITEM	NEW
TRAFFIC SIGNAL HEAD (NO BACKPLATE)	
TRAFFIC SIGNAL HEAD WITH BACKPLATE	
SIGNAL POLE, SPAN WIRE & FOUNDATION	
PEDESTAL POST	
ELECTRICAL CONDUIT RUN	
PEDESTRIAN PUSH BUTTON & INFO SIGN	
POWER METER	
PULL BOX	
LUMINAIRE W/ MAST ARM	
CONTROLLER CABINET	
16" LED PED SIGNAL HEAD	
SIGN SIGNAL-POLE-MOUNTED	
3 IMAGE VEHICLE DETECTOR (CAMERA)	
DETECTION ZONE (TYPICAL)	

SIGNS

STATE CROSSING Stop for Vehicles

DON'T WALK Push Button for Walk Signal

DON'T CROSS

TO CROSS PUSH BUTTON

Pole-Dia (4 each) (For top at pedestrian push buttons)

C

Are these needed? (Any crossings provided?) Staff will check with DPW also. 2

SIGNAL FACES

R Y G 12"

3-8 (no backplate)

1 12 (no backplate)

16"

P1-P2

MATERIALS LIST

EPC Staff to verify 4

ITEM #	ITEM	UNIT	QUANTITY
614-81140	TRAFFIC SIGNAL POLE STEEL (SPAN WIRE) Black Anodized (not Galvanized)	EACH	4
	SPAN WIRE CABLE	LF	515
	TETHER CABLE	LF	490
614-70336	TRAFFIC SIGNAL FACE (LED) (12/12/12) - Black Aluminum Signal Heads (McCain)	EACH	10
	TRAFFIC SIGNAL FACE (LED) (12/12/12/12) LEFT TURN HEAD Black Aluminum (McCain)	EACH	2
613-00200	ELECTRICAL CONDUIT, (2") PVC SCHEDULE 80 (total linear feet of conduit)	LF	460
613-00300	ELECTRICAL CONDUIT, (3") PVC SCHEDULE 80 (total linear feet of conduit)	LF	[illegible]
614-70150	PEDESTRIAN SIGNAL FACE (COUNTDOWN) (16")	EACH	[illegible]
614-72860	PEDESTRIAN PUSH BUTTON (PIZO)	EACH	[illegible]
	INFO SIGN (MUTCD #R10-3e)(SEE ABOVE [illegible]RAT[illegible]	EACH	[illegible]
614-72858	PEDESTAL POLE (3 FOOT 6 INCH) (FOR [illegible]TTONS & INFO SIGNS ONLY)	EACH	[illegible]
614-94000	PEDESTAL POST- 12' HIGH (STEEL)	EACH	0
613-13000	ESU-FA01/3M0320M-150-15/12N) (E-Lite-Star WITH 15' MAST ARM	EACH	4
613-07034	[illegible]6"x48"x18") (AT CABINET)	EACH	[illegible]
613-07060	[illegible]4"x36"x18") (ADJACENT TO POL[illegible]	EACH	[illegible]
614-10130	STREET NAME SIGN, SIGNAL-POLE-MOUNT[illegible]	EACH	[illegible]
614-72855	TRAFFIC SIGNAL CONTROLLER CABINET (332 D[illegible]OUP with Aux Rack)	EACH	[illegible]
614-86246	CONTROLLER (ATC EX 2070 Flex) (MCCAIN)	EACH	1
613-40000	CABINET FOUNDATION, CAST-IN-PLACE	EACH	1
503-00018	DRILLED CAISSON (18") SEE PED POLE SCHEDULE (FOR PEDESTAL POSTS)	LF	0
503-00036	DRILLED CAISSON (36") SEE SIGNAL POLE SCHEDULE	LF	64
613-30150	SECONDARY SERVICE PEDESTAL	EACH	1
700-90004	FURNISH AND INSTALL ELECTRICAL SERVICE	LS	1
613-00011	WIRING (IMSA Approved Wire)	LS	1
	MICROWAVE VEHICLE RADAR DETECTOR (MS Sedco Intersector)	EA	5
	CONFLICT MONITOR (2010ECLIP W/ ETHERNET PORT) (EDI)	EA	1
	Clary Battery Backup system (SP 1250-LX with six batteries)	EA	1
	Shielded Cat IV Cable for Radar Detectors	LF	
	MS Sedco Ethernet extenders (if the Cat IV cable run is over 300' in length)	EA	
	ETHERNET SWITCH (Dymes KY-3-170 EMA MANAGED INDUSTRIAL, RACK MOUNT)	EA	1
	Cellular Modem (Microhard Bullet-LTE)	EA	1

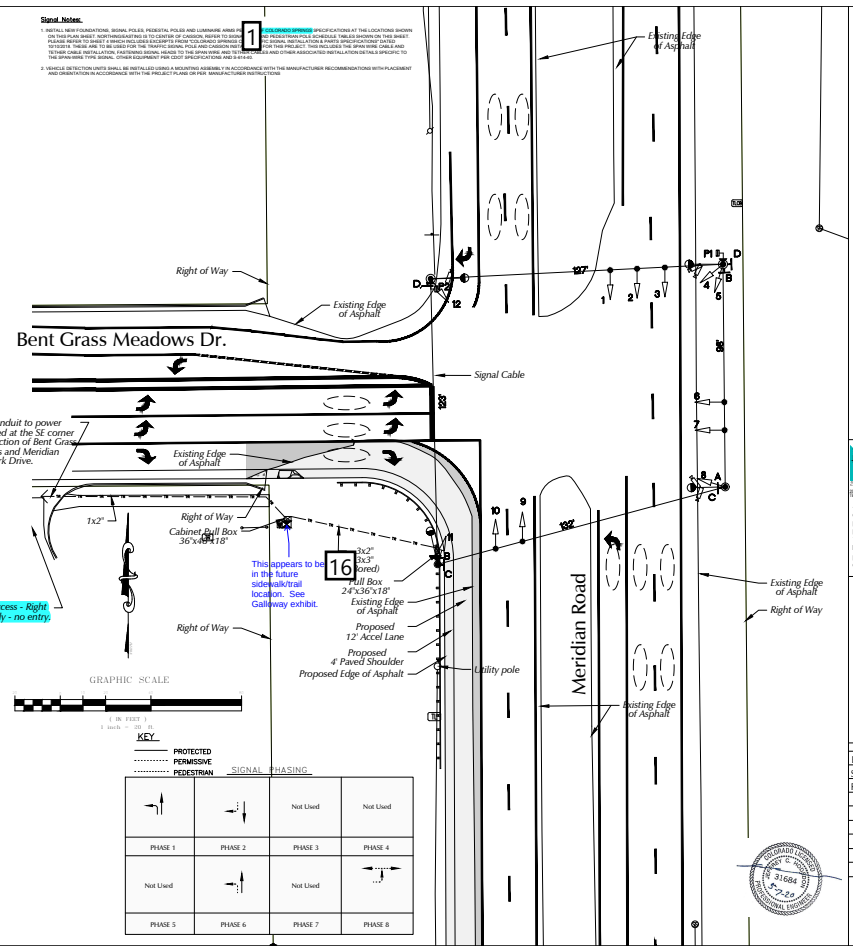
SIGNAL POLE SCHEDULE

LOCATION		NE CORNER		SE CORNER		SW CORNER		NW CORNER	
NORTHING		TBD		TBD		TBD		TBD	
EASTING		TBD		TBD		TBD		TBD	
CAISSON ELEV.		TBD		TBD		TBD		TBD	
BASE DIA.	DEPTH/*	36"	16'	36"	16'	36"	16'	36"	16'

*PAY LENGTH

Signal Notes:

1. INSTALL NEW FOUNDATIONS, SIGNAL POLES, PEDESTAL POLES AND LUMINAIRE ARMS IN [illegible] COLORADO SPRINGS SPECIFICATIONS AT THE LOCATIONS SHOWN ON THIS PLAN SHEET. NORTHING/EASTING IS TO CENTER OF CAISSON. REFER TO SIGNAL POLE AND PEDESTRIAN POLE SCHEDULE TABLES SHOWN ON THIS SHEET. 10/13/2016 THESE ARE TO BE USED FOR THE TRAFFIC SIGNAL POLE AND CAISSON NORTHING AND EASTING COORDINATES. 10/13/2016 THESE ARE TO BE USED FOR THE TRAFFIC SIGNAL POLE AND CAISSON NORTHING AND EASTING COORDINATES. 1
2. VEHICLE DETECTION UNITS SHALL BE INSTALLED USING A MOUNTING ASSEMBLY IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS WITH PLACEMENT AND ORIENTATION IN ACCORDANCE WITH THE PROJECT PLANS OR PER MANUFACTURER INSTRUCTIONS.



KEY

PROTECTED

PERMISSIVE

PEDESTRIAN

SIGNAL PHASING

PHASE 1	PHASE 2	PHASE 3	PHASE 4
		Not Used	Not Used
Not Used		Not Used	
PHASE 5	PHASE 6	PHASE 7	PHASE 8

TRAFFIC SIGNAL DESIGN
Bent Grass Meadows Dr./Meridian Rd.

LSC TRANSPORTATION CONSULTANTS, INC.

1604 E. Pikes Peak Ave. Ste 304 Colorado Springs, Co. 80909
(719) 635-3757 FAX: (719) 635-3200

Project Manager
JEFFREY C. HODSON, PE

REVISIONS	DATE
Revisions #4	5/4/2020
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 3/17/16

SCALE: 1"=20'

DRAWN BY: MR

JOB NO.: 15-0297/15-0297

DWG: 15-0297_Signal Plan.dwg

COLORADO LICENSED No. 31684 5-7-20 PROFESSIONAL ENGINEER

SHT NO. 5

OF 6

Page: [6] 194900_Signal Plan Sheets-Signal Design

Number: 1 Author: dsdrice Date: 7/16/2020 16:44:11
CITY OF COLORADO SPRINGS

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:13:23
LSC Response: The plan has been updated

Number: 2 Author: dsdrice Subject: Callout Date: 7/17/2020 09:12:32
Are these needed? (Any crossings provided?) Staff will check with DPW also.

Author: jchodsdon Subject: Sticky Note Date: 7/29/2020 18:06:44
These plans show the ability for peds (or bicycles) to cross Meridian Road on the north leg. Other legs show signage for "no peds."

Number: 3 Author: dsdrice Date: 7/15/2020 18:26:54
VIDEO IMAGE VEHICLE DETECTOR (CAMERA)

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:16:15
LSC Response: The plan has been updated

Number: 4 Author: dsdrice Subject: Callout Date: 7/16/2020 18:22:54
EPC Staff to verify

Number: 5 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:15:28

Number: 6 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:23:15

Number: 7 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:22:50

Number: 8 Author: dsdrice Date: 7/16/2020 17:57:29
2

Number: 9 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:21:37

Number: 10 Author: dsdrice Date: 7/16/2020 17:57:33
2

Number: 11 Author: dsdrice Date: 7/16/2020 18:22:30

Number: 12 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:15:41

Number: 13 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:20:49

Number: 14 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:20:56

Number: 15 Author: dsdrice Date: 7/15/2020 18:21:04
1

Number: 16 Author: dsdrice Subject: Callout Date: 7/16/2020 16:54:41
This appears to be in the future sidewalk/trail location. See Galloway exhibit.

Author: jchodsdon Subject: Sticky Note Date: 7/29/2020 18:08:27
The cabinet location can be adjusted for the final plan set.

Number: 17 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:17:18

Comments from page [6] 194900_Signal Plan Sheets-Signal Design continued on next page

STREET NAME SIGNS

A Meridian Rd

B Bent Grass Meadows Dr

Sign details to be included with shop drawing submittals

LEGEND

ITEM	NEW
TRAFFIC SIGNAL HEAD (NO BACKPLATE)	
TRAFFIC SIGNAL HEAD WITH BACKPLATE	
SIGNAL POLE, SPAN WIRE & FOUNDATION	
PEDESTAL POST	
ELECTRICAL CONDUIT RUN	
PEDESTRIAN PUSH BUTTON & INFO SIGN	
POWER METER	
PULL BOX	
LUMINAIRE W/ MAST ARM	
CONTROLLER CABINET	
16" LED PED SIGNAL HEAD	
SIGN, SIGNAL-POLE-MOUNTED	
VIDEO IMAGE VEHICLE DETECTOR (CAMERA)	
VIDEO DETECTION ZONE (TYPICAL)	

SIGNS

STATE CROSSING YIELD TO VEHICLES

DON'T WALK PUSH BUTTON TO PLAY CROSSING

DON'T CROSS

TO CROSS PUSH BUTTON

Pole-Dia (4 each) (For top at pedestrian push buttons)

D

Are these needed? (Any crossings provided?) Staff will check with DPW also.

C

SIGNAL FACES

R Y G 12"

S-9 (no backplate)

12" 12" 12" 12"

1 - 12 (no backplate)

16"

P1-P2

MATERIALS LIST

EPC Staff to verify

ITEM #	ITEM	UNIT	QUANTITY
614-81140	TRAFFIC SIGNAL POLE STEEL (SPAN WIRE) Black Anodized (not Galvanized)	EACH	4
	SPAN WIRE CABLE	LF	515
	TETHER CABLE	LF	490
614-70336	TRAFFIC SIGNAL FACE (LED) (12/12/12) - Black Aluminum Signal Heads (McCain)	EACH	10
	TRAFFIC SIGNAL FACE (LED) (12/12/12/12) LEFT TURN HEAD Black Aluminum (McCain)	EACH	2
613-00200	ELECTRICAL CONDUIT, (2") PVC SCHEDULE 80 (total linear feet of conduit)	LF	460
613-00300	ELECTRICAL CONDUIT, (3") PVC SCHEDULE 80 (total linear feet of conduit)	LF	200
614-70150	PEDESTRIAN SIGNAL FACE (COUNTDOWN) (16")	EACH	2
614-72860	PEDESTRIAN PUSH BUTTON (PIZO)	EACH	2
	INFO SIGN (MUTCD #R10-3e)(SEE ABOVE ILLUSTRATION)	EACH	2
614-72858	PEDESTAL POLE (3 FOOT 6 INCH) (FOR PUSH BUTTONS & INFO SIGNS ONLY)	EACH	0
614-84000	PEDESTAL POST- 12' HIGH (STEEL)	EACH	0
613-13000	LUMINAIRE (ESU-FA01M0325DM-150-151ZN) (E-Lite-Ste WITH 15' MAST ARM	EACH	4
613-07034	PULL BOX (36"x48"x18") (AT CABINET)	EACH	1
613-07060	PULL BOX (24"x36"x18") (ADJACENT TO POLES)	EACH	8
614-10130	STREET NAME SIGN, SIGNAL-POLE-MOUNTED	EACH	3
614-72855	TRAFFIC SIGNAL CONTROLLER CABINET (332 D BATTERY BACKUP with Aux Rack)	EACH	1
614-86246	CONTROLLER (ATC EX 2070 Flex) (MCCAIN)	EACH	1
613-40000	CABINET FOUNDATION, CAST-IN-PLACE	EACH	1
503-00018	DRILLED CAISSON (18") SEE PED POLE SCHEDULE (PEDESTAL POSTS)	LF	0
503-00036	DRILLED CAISSON (36") SEE SIGNAL POLE SCHEDULE	LF	64
613-30150	SECONDARY SERVICE PEDESTAL	EACH	1
700-00004	FURNISH AND INSTALL ELECTRICAL SERVICE	LS	1
613-00011	WIRING (IMSA Approved Wire)	LS	1
	MICROWAVE VEHICLE RADAR DE[illegible]	EA	5
	CONFLICT MONITOR (2010ECLIP T[illegible]PORT) (ISDI)	EA	1
	Clary Battery Backup system (SP 1250-LX with six batteries)	EA	1
	Shielded Cat IV Cable for Radar Detectors	LF	
	MS Sedco Ethernet extenders (if the Cat IV [illegible]	EA	
	ETHERNET SWITCH (Dymes KY-3-170 EN[illegible] INDUSTRIAL, RAD[illegible]	EA	1
	Cellular Modem (Microhard Bullet-LTE)	EA	1

18 20 21 22 23 24 25 26 27 28 29

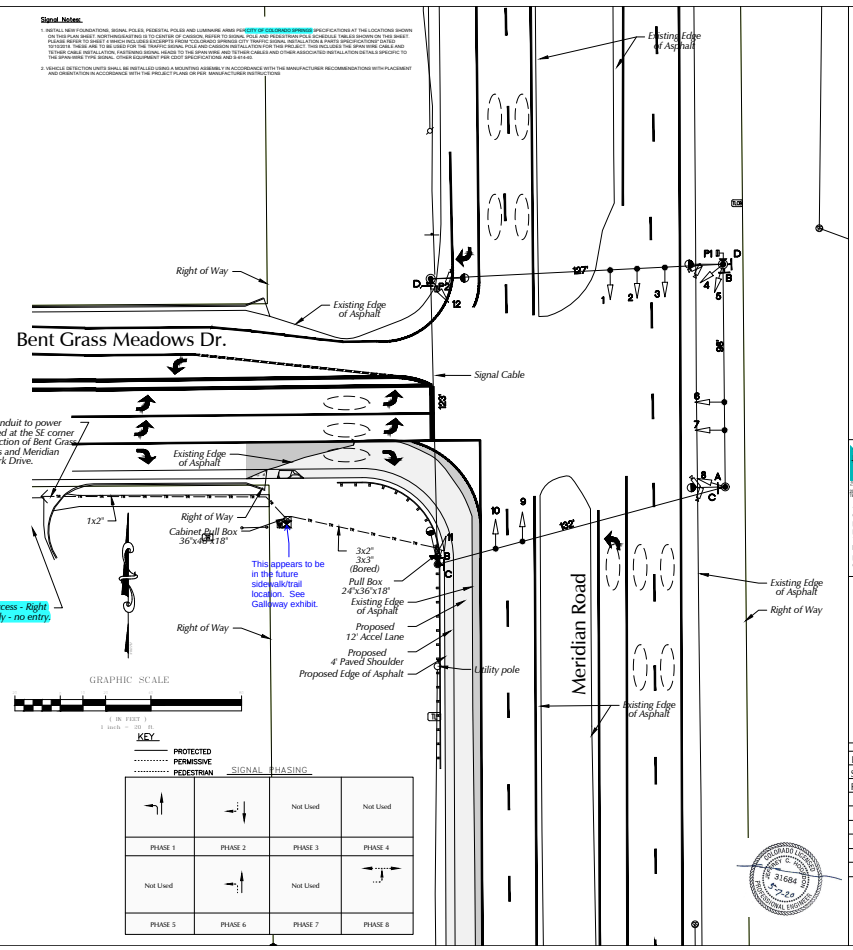
SIGNAL POLE SCHEDULE

LOCATION	NE CORNER		SE CORNER		SW CORNER		NW CORNER	
NORTHING	TBD		TBD		TBD		TBD	
EASTING	TBD		TBD		TBD		TBD	
CAISSON ELEV.	TBD		TBD		TBD		TBD	
BASE DIA. / DEPTH/*	36"	16'	36"	16'	36"	16'	36"	16'

*PAY LENGTH

Signal Notes:

1. INSTALL NEW FOUNDATIONS, SIGNAL POLES, PEDESTAL POLES AND LUMINAIRE ARMS PER CITY OF COLORADO SPRINGS SPECIFICATIONS AT THE LOCATIONS SHOWN ON THIS PLAN SHEET. NORTHING/EASTING IS TO CENTER OF CAISSON. REFER TO SIGNAL POLE AND PEDESTRIAN POLE SCHEDULE TABLES SHOWN ON THIS SHEET. REFER TO SIGNAL POLE DETAILS, PEDESTAL POLE DETAILS, AND SIGNAL FACE DETAILS SHOWN ON THE CITY OF COLORADO SPRINGS STANDARDS DATED 10/15/2018. THESE ARE TO BE USED FOR THE TRAFFIC SIGNAL POLE AND CAISSON INSTALLATION FOR THIS PROJECT. THIS INCLUDES THE SPAN WIRE CABLE AND TETHER CABLE INSTALLATION, FASTENING SIGNAL HEADS TO THE SPAN WIRE AND TETHER CABLES AND OTHER ASSOCIATED INSTALLATION DETAILS SPECIFIC TO THE SPAN-WIRE TYPE SIGNAL. OTHER EQUIPMENT PER CDOT SPECIFICATIONS AND 2-818-45.
2. VEHICLE DETECTION UNITS SHALL BE INSTALLED USING A MOUNTING ASSEMBLY IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS WITH PLACEMENT AND ORIENTATION IN ACCORDANCE WITH THE PROJECT PLANS OR PER MANUFACTURER INSTRUCTIONS.



KEY

PROTECTED

PERMISSIVE

PEDESTRIAN

SIGNAL PHASING

PHASE 1	PHASE 2	PHASE 3	PHASE 4
		Not Used	Not Used
PHASE 5	PHASE 6	PHASE 7	PHASE 8
Not Used		Not Used	

TRAFFIC SIGNAL DESIGN
Bent Grass Meadows Dr./Meridian Rd.

LSC TRANSPORTATION CONSULTANTS, INC.

1504 E. Pikes Peak Ave. Ste 304 Colorado Springs, Co. 80909
(719) 473-2292 FAX: (719) 473-2295

Project Manager
JEFFREY C. HODSON, PE

REVISIONS	DATE
Revisions #4	5/4/2020
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 3/17/16

SCALE: 1"=20'

DRAWN BY: MR

JOB NO.: 154300/154301

DWG: 154300_Signal Plan.dwg

COLORADO LICENSED No. 31684 PROFESSIONAL ENGINEER

SHT NO. 5

OF 6

Number: 18 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:17:46

Number: 19 Author: dsdrice Date: 7/15/2020 14:31:04
7-11 Access - RightOUT only - no entry

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 18:08:56
LSC Response: The plan has been updated to reflect closure of the 7-11 access point.

Number: 20 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:17:58

Number: 21 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:16:26

Number: 22 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:16:20

Number: 23 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:18:19

Number: 24 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:26:00

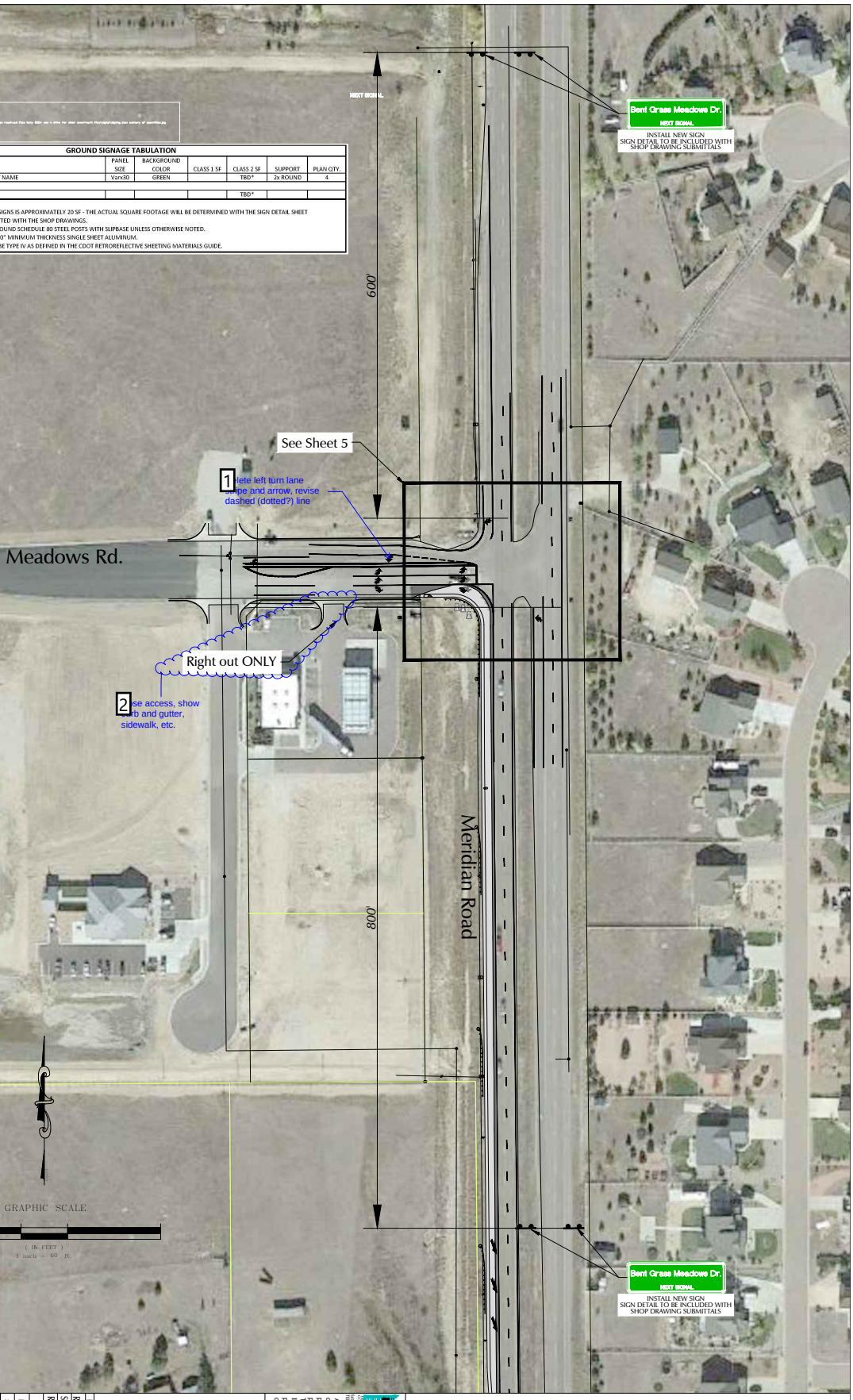
Number: 25 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:19:46

Number: 26 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:18:35

Number: 27 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:18:50

Number: 28 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:19:06

Number: 29 Author: dsdrice Subject: Highlight Date: 7/15/2020 18:19:15



GROUND SIGNAGE TABULATION

	PANEL SIZE	BACKGROUND COLOR	CLASS 1 SF	CLASS 2 SF	SUPPORT	PLAN QTY.
NAME	Varx30	GREEN		TBD*	2x ROUND	4
				TBD*		

NGNS IS APPROXIMATELY 20 SF - THE ACTUAL SQUARE FOOTAGE WILL BE DETERMINED WITH THE SIGN DETAIL SHEET
TED WITH THE SHOP DRAWINGS.
OUND SCHEDULE 80 STEEL POSTS WITH SLIPBASE UNLESS OTHERWISE NOTED.
0" MINIMUM THICKNESS SINGLE SHEET ALUMINUM.
BE TYPE IV AS DEFINED IN THE CDOT RETROREFLECTIVE SHEETING MATERIALS GUIDE.

Project Manager
JEFFREY C. HODSDON, PE

COLORADO LICENSED
JEFFREY C. HODSDON
31684
PROFESSIONAL ENGINEER

REVISIONS	DATE
Revisions #3	5/7/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE:
SCALE:

LSC TRANSPORTATION CONSULTANTS, INC.
2504 E. Pikes Peak Avenue, Colorado Springs, CO 80909
TELEPHONE: 719.633.2868 FAX: 719.633.5430

ADVANCE STREET NAME SIGNING PLAN
Bent Grass Meadows Dr./Meridian Rd.

Page: [7] 194900_Signal Plan Sheets-Signing

Number: 1 Author: dsdrice Subject: Callout Date: 7/15/2020 14:27:08

Delete left turn lane stripe and arrow, revise dashed (dotted?) line

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:16:42

LSC Response: The plan has been updated

Number: 2 Author: dsdrice Subject: Cloud+ Date: 7/15/2020 14:29:53

close access, show curb and gutter, sidewalk, etc.

Author: cguillotte Subject: Sticky Note Date: 7/29/2020 12:16:39

LSC Response: The plan has been updated

COMMENT RESPONSES – LOI

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220 • GallowayUS.com

April 7, 2020

El Paso County Development Services Department
Attn: Ms. Kari Parsons
2880 International Circle
Colorado Springs, CO 80910

Galloway responses

SUBJECT: Bent Grass Meadows Drive & Meridian Road
Construction Drawing Review (CDR) – Letter of Intent

Dear Ms. Parsons,

This Letter of Intent (LOI) is being submitted as part of the Construction Drawing Review (CDR) Application. Challenger Communities, LLC is proposing to construct a right turn lane from Bent Grass Meadows Drive onto Meridian Road, and also a south bound 960' long acceleration lane and 222' taper along Meridian Road.

1. ***OWNER/APPLICANT AND CONSULTANT:***

DEVELOPER / APPLICANT:
Challenger Communities, LLC
8605 Explorer Dr.
Colorado Springs, CO 80920

CONSULTANT:
Galloway & Company, Inc.
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920

2. ***SITE LOCATION, SIZE AND ZONING:***

The Bent Grass Meadows Drive & Meridian Road project site is located in the Northwest ¼ and Southwest ¼ of Section 1, Township 13S, Range 65W, of the Sixth Principal Meridian, County of El Paso, State of Colorado. The proposed improvements are located at the intersection of Bent Grass Meadows Drive and Meridian Road, as well as the west side of Meridian Road from Bent Grass Meadows Drive to Owl Place. This includes the construction of a right turn lane from Bent Grass Meadows Drive onto Meridian Road and a southbound 960' long acceleration lane and 222' taper along Meridian Road. The site is in Public Right-of-Way and therefore does not have an associated zoning designation.

3. ***REQUEST AND JUSTIFICATION:***

This request for Bent Grass Meadows Drive & Meridian Road project was triggered by the proposed development of Bent Grass Residential Filing No. 2 (SF1914) that is part of the approved PUD Site Plan in 2014 (DSD File No. PUD-14-002).

Due to the increased traffic density through Bent Grass Meadows Drive from recent development in Bent Grass Metropolitan District (i.e. Bent Grass Commercial Filing No. 1, Bent Grass Residential Filing No. 1 and Filing No. 2) the need for increased traffic capacity has reached justification for the construction of proposed improvements outlined in the Traffic Impact Study (TIS) completed by LSC Transportation Consultants, Inc. dated October 14, 2019 (SF1914); including: proposed signals at the intersection of Bent Grass Meadows Drive and Meridian Road, a right-turn only lane from Bent Grass Meadows Drive onto Meridian Road, and an acceleration lane along Meridian Road for the right-turn only on from Bent Grass Meadows Drive. A deviation was previously approved waiving these improvements with the development of Bent Grass Residential Filing No. 1 and Bent Grass East Commercial Filing 2A. However, with the recent proposed development of Bent Grass Residential Filing No. 2, the aforementioned improvements must now be constructed.

April 17, 2020
Date updated

4. ***EXISTING AND PROPOSED FACILITIES, STRUCTURES, AND ROADS, ETC:***

Existing

The existing project site consists of Bent Grass Meadows Drive, an 80' R.O.W. Collector, consisting of (1) left turn lane and (1) right turn lane East bound onto Meridian Road. Southbound Meridian Road consists of (2) lanes and (1) deacceleration lane approaching Bent Grass Meadows Drive. Northbound Meridian Road consists of (2) lanes, and (1) left turn lane onto Bent Grass Meadows Drive. An existing roadside ditch runs parallel to Southbound Meridian road along the west side. Currently, (3) existing 45" X 29" Elliptical RCP storm pipes run under Bent Grass Meadows Drive at Meridian Road.

Proposed

East bound Bent Grass Meadows Drive is to add a turn lane onto Meric text added st bound Bent Grass Meadows Drive will now include (2) left turn lanes and (1) right turn lane. In addition, a 960' acceleration lane with a 222' taper will be constructed along South bound Meridian Road. The (3) existing 45" X 29" Elliptical RCP storm pipes and associated FES' will be relocated to accommodate the additional turn and acceleration lane. Additionally, (2) new 45" X 29" Elliptical RCP storm pipes and necessary FES' will be constructed next to the (3) existing elliptical pipe, under Bent Grass Meadows Drive, to convey additional off-site flows described in the FDR.

Additionally, the intersection of Bent Grass Meadows Drive and Meridian Road is proposed to be signalized. The locations are shown in Attachment 9 – Traffic Signal Plans.

Lastly, as a part of the Bent Grass Meadows Drive & Meridian Road project, Challenger Homes, Inc. has agreed to provide a drainage study on the existing roadside ditch and crossing under Bent Grass Meadows Drive along Southbound Meridian Road. The improvements associated with this study are not part of this project and are only provided to give the County a look at what the associated improvements would be, as it is anticipated these improvements will be constructed in the future when Meridian Road is widened and additional ROW is obtained to improve the ditch between Bent Grass Meadows Dr. and Owl Pl.

5. ***WAIVER/DEVIATION REQUESTS AND JUSTIFICATION:***

There are no waiver or deviations requests for the Bent Grass Meadows Drive & Meridian Road project.

6. ***THE TOTAL NUMBER OF ACRES IN THE REQUESTED AREA:***

Bent Grass Meadows Drive & Meridian Road project consists of 0.69 acres in the requested area.

7. ***ANTICIPATED SCHEDULE OF DEVELOPMENT:*** August 2020 Date updated

Construction for the development of this project is currently projected to begin in June of 2020. It is estimated that construction activities will be completed by June 2021. Final stabilization is expected in July of 2021.

August 2021

Date updated

Respectfully submitted,

_____

Grant Dennis
Civil Engineering Project Manager
Galloway & Company, Inc.

Attachments:

Attachment 1 – Construction Drawings (Plans/Profiles)
Attachment 2 – Drainage Letter
Attachment 3 – Financial Assurance Forms
Attachment 4 – Grading & Erosion Control Plan
Attachment 5 – Letter of Intent

Attachment 6 – Erosion and Stormwater Quality Control Permit (ESQCP)
Attachment 7 – Traffic Impact Study
Attachment 8 – Storm Water Management Plan (SWMP)
Attachment 9 – Traffic Signal Plans
Attachment 10 – GEC Checklist
Attachment 11 – SWMP Checklist
Attachment 12 – Future Sidewalk Exhibit

COMMENT RESPONSES – ESQCP

EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP)
EL PASO COUNTY APPLICATION AND PERMIT

Galloway responses

APPLICANT INFORMATION ***PERMIT NUMBER*** _____

Owner Information	
Owner	Bent Grass Metropolitan District
Name (person of responsibility)	
Company/Agency	Challenger Communities, LLC
Position of Applicant	
Address (physical address, not PO Box)	8605 Explorer Dr, Suite 250
City	Colorado Springs
State	CO
Zip Code	80920
Mailing address, if different from above	(Same as above)
Telephone	
FAX number	
Email Address	
Cellular Phone number	
Contractor/Operator Information	
Name (person of responsibility)	TBD
Company	TBD
Address (physical address, not PO Box)	
City	
State	
Zip Code	
Mailing address, if different from above	
Telephone	
FAX number	
Email Address	
Cellular Phone number	
Erosion Control Supervisor (ECS)*	
ECS Phone number*	
ECS Cellular Phone number*	

*Required for all applicants. May be provided at later date pending securing a contract when applicable.

PROJECT INFORMATION

Project Information	
Project Name	Bent Grass Meadows Drive & Meridian Road
Legal Description	NORTHWEST QUARTER AND SOUTHWEST QUARTER OF SECTION 1 T13S R65W OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO
Address (or nearest major cross streets)	Bent Grass Meadows Drive & Meridian Road
Acreage (total and disturbed)	Total: 0.69 AC Disturbed: 0.69 AC
Schedule	Start of Construction: June 2020 Date changed Completion of Construction: June 2021 Final Stabilization: July 2021
Project Purpose	Construct a right-turn acceleration lane on Southbound Meridian Road at Bent Grass Meadows Drive. This includes the addition of adding signals to the intersection of Meridian Road and Bent Grass Meadows Drive.
Description of Project	Bent Grass Meadows Drive & Meridian Road consists of adding a right turn lane from Bent Grass Meadows Drive onto Meridian Road, and also a south bound 960' long acceleration lane and 222-foot taper along Meridian Road. Taper length updated
Tax Schedule Number	N/A – Project scope is encompassed in County R.O.W.

FOR OFFICE USE ONLY

The following signature from the ECM Administrator signifies the approval of this ESQCP. All work shall be performed in accordance with the permit, the El Paso County Engineering Criteria Manual (ECM) Standards, City of Colorado Springs Drainage Criteria Manual, Volume 2 (DCM2) as adopted by El Paso County Addendum, approved plans, and any attached conditions. The approved plans are an enforceable part of the ESQCP. Construction activity, except for the installation of initial construction BMPs is not permitted until issuance of a Construction permit and Notice to Proceed.

Signature of ECM Administrator: _____ Date _____

1.1 REQUIRED SUBMISSIONS

In addition to this completed and signed application, the following items must be submitted to obtain an ESQCP:

- Permit fees
- Stormwater Management Plan (SWMP) meeting the requirements of DCM2 and ECM either as part of the plan set or as a separate document;
- Cost estimates of construction and maintenance of construction and permanent stormwater control measures (Cost estimates shall be provided on a unit cost basis for all stormwater BMPs);
- Financial surety in an amount agreeable to the ECM Administrator based on the cost estimates of the stormwater quality protection measures provided. The financial surety shall be provided in the form of a Letter of Credit, Surety with a Bonding Company, <u>or other forms acceptable to El Paso County</u>;
- Operation and Maintenance Plan for any proposed permanent stormwater control measures; and
- Signed Private Detention Basin/Stormwater Quality Best Management Practice Maintenance Agreement and Easement, if any permanent stormwater control measures are to be located on site.

1.2 RESPONSIBILITY FOR DAMAGE

The County and its officers and employees, including but not limited to the ECM Administrator, shall not be answerable or accountable in any manner, for injury to or death of any person, including but not limited to a permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder, or for damage to property resulting from any activities undertaken by a permit holder or under the direction of a permit holder. The permit holder shall be responsible for any liability imposed by law and for injuries to or death of any person, including but not limited to the permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder, or damage to property arising out of work or other activity permitted and done by the permit holder under a permit, or arising out of the failure on the permit holder's part to perform the obligations under any permit in respect to maintenance or any other obligations, or resulting from defects or obstructions, or from any cause whatsoever during the progress of the work, or other activity, or at any subsequent time work or other activity is being performed under the obligations provided by and contemplated by the permit.

To the extent allowed by law, the permit holder shall indemnify, save, and hold harmless the County and its officers and employees, including but not limited to the BOCC and ECM Administrator, from all claims, suits or actions of every name, kind and description brought for or on account of injuries to or death of any person, including but not limited to the permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder and the public, or damage to property resulting from the performance of work or other activity under the permit, or arising out of the failure on the permit holder's part to perform his obligations under any permit in respect to maintenance or any other obligations, or resulting from defects or obstructions, or from any cause whatsoever during the progress of the work, or other activity or at any subsequent time work or other activity is being performed under the obligations provided by and contemplated by the permit, except as otherwise provided by state law. The permit holder waives any and all rights to any type of expressed or implied indemnity against the County, its officers or employees.

1.3 APPLICATION CERTIFICATION

We, as the Applicants or the representative of the Applicants, hereby certify that this application is correct and complete as per the requirements presented in this application and the El Paso County Engineering Criteria Manual and Drainage Criteria Manual, Volume 2 and El Paso County Addendum.

We, as the Applicants or the representatives of the Applicants, have read and will comply with all of the requirements of the specified Stormwater Management Plan and any other documents specifying stormwater best management practices to be used on the site including permit conditions that may be required by the ECM Administrator. We understand that the stormwater control measures are to be maintained on the site and revised as necessary to protect stormwater quality as the project progresses. We further understand that a Construction Permit must be obtained and all necessary stormwater quality control measures are to be installed in accordance with the SWMP, the El Paso County Engineering Criteria Manual, Drainage Criteria Manual, Volume 2 and El Paso County Addendum before land disturbance begins and that failure to comply will result in a Stop Work Order and may result in other penalties as allowed by law. We further understand and agree to indemnify, save, and hold harmless the County and its officers and employees, including but not limited to the BOCC and ECM Administrator, from all claims, suits or actions of every name, kind and description as outlined in Section 1.2 Responsibility for Damage.

_____ Date:_____

Signature of Owner or Representative

_____

Print Name of Owner or Representative

_____ Date:_____

Signature of Operator or Representative

_____ Signatures Added

Print Name of Operator or Representative

Permit Fee $_____

Surcharge $_____

Financial Surety $_____ Type of Surety _____

Total $_____

COMMENT RESPONSES – FAE

Revised Significant Digits of highlighted items to one decimal place.

Adjust significant digits/ decimals shown on yellow-highlighted items

GALLOWAY RESPONSE

2019 Financial Assurance Estimate Form
(with pre-plat construction)

CDR19004

Revised to show "CDR19004"

Updated: 7/16/2019

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	e No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining	
SECTION 1 - GRADING AND EROSION CONTROL (Construction and Permanent BMPs)								
* Earthwork								*
less than 1,000; $5,300 min	178	CY	$ 8.00	=	$ 5,300.00		$ 5,300.00	*
1,000-5,000; $8,000 min		CY	$ 6.00	=	$ -		$ -	*
5,001-20,000; $30,000 min		CY	$ 5.00	=	$ -		$ -	*
		CY	$ 3.50	=	$ -		$ -	*
		CY	$ 2.50	=	$ -		$ -	*
		CY	$ 2.00	=	$ -		$ -	*
* Permanent Seeding (inc. noxious weed mgmnt.)	0.35	AC	$ 800.00	=	$ 277.60		$ 277.60	*
* Mulching		AC	$ 750.00	=	$ -		$ -	*
* Permanent Erosion Control Blanket	1,678	SY	$ 6.00	=	$ 10,070.88		$ 10,070.88	*
* Permanent Pond/BMP Construction		CY	$ 20.00	=	$ -		$ -	*
* Permanent Pond/BMP (Spillway)		EA		=	$ -		$ -	*
* Permanent Pond/BMP (Outlet Structure)		EA		=	$ -		$ -	
S		LF	$ 3.00	=	$ -		$ -	
Temporary Erosion Control Blanket		SY	$ 3.00	=	$ -		$ -	
Vehicle Tracking Control		EA	$ 2,370.00	=	$ -		$ -	
Silt Fence	1,200	LF	$ 2.50	=	$ 3,000.00		$ 3,000.00	
Temporary Seeding	0.35	AC	$ 628.00	=	$ 217.92		$ 217.92	
Temporary Mulch		AC	$ 750.00	=	$ -		$ -	
Erosion Bales		EA	$ 25.00	=	$ -		$ -	
Erosion Logs/Straw Waddle		LF	$ 5.00	=	$ -		$ -	
		EA	$ 500.00	=	$ -		$ -	
		EA	$ 167.00	=	$ -		$ -	
		EA	$ 1,762.00	=	$ -		$ -	
Concrete Washout Basin	1	EA	$ 900.00	=	$ 900.00		$ 900.00	
Road Straw Bale Check Dams	13	EA	$ 100.00	=	$ 1,300.00		$ 1,300.00	
[insert items not listed but part of construction plans]				=	$ -		$ -	
MAINTENANCE (35% of Construction BMPs)				=	$ 1,896.27		$ 1,896.27	
* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)		**Section 1 Subtotal**		**=**	**$ 22,962.67**		**$ 22,962.67**	
SECTION 2 - PUBLIC IMPROVEMENTS *								
ROADWAY IMPROVEMENTS								*
Construction Traffic Control	1	LS	$ 5,000.00	=	$ 5,000.00		$ 5,000.00	*
Gravel Shoulder (135 lbs/cf)	47	CY	$ 50.00	=	$ 2,370.00		$ 2,370.00	*
Aggregate Base Course (135 lbs/cf)	856	CY	$ 50.00		$ 42,806.50		$ 42,806.50	*
Asphalt Pavement (3" thick)		SY	$ 14.00		$ -		$ -	*
Asphalt Pavement (4" thick)		SY	$ 19.00		$ -		$ -	*
	2,568	SY	$ 29.00		$ 74,483.02		$ 74,483.02	*
47 lbs/cf) _" thick		Tons	$ 88.00	=	$ -		$ -	*
		SF	$ 8.00	=	$ -		$ -	*
Regulatory Sign/Advisory Sign		EA	$ 300.00	=	$ -		$ -	*
Guide/Street Name Sign		EA		=	$ -		$ -	*
Epoxy Pavement Marking	[illegible]	SF	$ 13.00	=	$ 22,100.00		$ 22,100.00	*
Thermoplastic Pavement Marking		SF	$ 23.00	=	$ -		$ -	*
Barricade - Type 3		EA	$ 200.00	=	$ -		$ -	*
Delineator - Type I		EA	$ 24.00	=	$ -		$ -	*
Curb and Gutter, Type A (6" Vertical)		LF	$ 30.00	=	$ -		$ -	*
(		LF	$ 30.00	=	$ -		$ -	*
(		LF	$ 30.00	=	$ -		$ -	*
4" Sidewalk (common areas only)		SY	$ 48.00	=	$ -		$ -	*
5" Sidewalk		SY	$ 60.00	=	$ -		$ -	*
6" Sidewalk		SY	$ 72.00	=	$ -		$ -	*
8" Sidewalk		SY	$ 96.00		$ -		$ -	*
Pedestrian Ramp		EA	$ 1,150.00	=	$ -		$ -	*
Cross Pan, local (8" thick, 6' wide to include return)		LF	$ 61.00	=	$ -		$ -	*
Cross Pan, collector (9" thick, 8' wide to include return)		LF	$ 92.00		$ -		$ -	*
Curb Chase		EA	$ 1,480.00	=	$ -		$ -	*
Guardrail Type 3 (W-Beam)	460	LF	$ 49.00	=	$ 22,540.00		$ 22,540.00	*
Guardrail Type 7 (Concrete)		LF	$ 72.00	=	$ -		$ -	*
Guardrail End Anchorage	4	EA	$ 2,098.00	=	$ 8,392.00		$ 8,392.00	*
Guardrail Impact Attenuator		EA	$ 3,767.00	=	$ -		$ -	*
Sound Barrier Fence (CMU block, 6' high)		LF	$ 78.00		$ -		$ -	*
Sound Barrier Fence (panels, 6' high)		LF	$ 80.00	=	$ -		$ -	*
Electrical Conduit, Size =		LF	$ 16.00	=	$ -		$ -	*
Traffic Signal, complete intersection	1	EA	$ 425,000	=	$ 425,000.00		$ 425,000.00	*

Added mulching quantity matching seeding.

VTC added to the FAE.

Added mulching quantity matching seeding.

Revised to include Erosion logs/straw waddle.

Revised to include (3) street signs.

Revised to include ther-moplastic marking.

Revised to include 70 LF

Add/verify all highlighted items

Quantities for blue high-lighted items verified/ added.

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining	
				=	$ -		$ -	
[insert items not listed but part of construction plans]				=	$ -		$ -	*
STORM DRAIN IMPROVEMENTS								*
Concrete Box Culvert (M Standard), Size (16 x 6)		LF		=	$ -		$ -	*
18" Reinforced Concrete Pipe		LF	$ 65.00	=	$ -		$ -	*
24" Reinforced Concrete Pipe		LF	$ 78.00	=	$ -		$ -	*
30" Reinforced Concrete Pipe		LF	$ 97.00	=	$ -		$ -	*
36" Reinforced Concrete Pipe		LF	$ 120.00	=	$ -		$ -	*
42" Reinforced Concrete Pipe		LF	$ 160.00	=	$ -		$ -	*
48" Reinforced Concrete Pipe		LF	$ 195.00	=	$ -		$ -	*
54" Reinforced Concrete Pipe		LF	$		-		$ -	*
60" Reinforced Concrete Pipe		LF	$		-		$ -	*
66" Reinforced Concrete Pipe		LF	$ 332.00	=	$ -		$ -	*
72" Reinforced Concrete Pipe		LF	$ 380.00	=	$ -		$ -	*
45" x 29" Reinforced Concrete Elliptical Pipe	259	LF	$ 120.00	=	$ 31,064.40		$ 31,064.40	
18" Corrugated Steel Pipe		LF	$ 84.00	=	$ -		$ -	*
24" Corrugated Steel Pipe		LF	$ 96.00	=	$ -		$ -	*
30" Corrugated Steel Pipe		LF	$ 122.00	=	$ -		$ -	*
36" Corrugated Steel Pipe		LF	$ 147.00	=	$ -		$ -	*
42" Corrugated Steel Pipe		LF	$ 168.00	=	$ -		$ -	*
48" Corrugated Steel Pipe		LF	$ 178.00	=	$ -		$ -	*
54" Corrugated Steel Pipe		LF	$ 260.00	=	$ -		$ -	*
60" Corrugated Steel Pipe		LF	$ 280.00	=	$ -		$ -	*
66" Corrugated Steel Pipe		LF	$ 340.00	=	$ -		$ -	*
72" Corrugated Steel Pipe		LF	$ 400.00	=	$ -		$ -	*
78" Corrugated Steel Pipe		LF	$ 460.00	=	$ -		$ -	*
84" Corrugated Steel Pipe		LF	$ 550.00	=	$ -		$ -	*
Flared End Section (FES) RCP Size = 45" x 29" (unit cost = 6x pipe unit cost)	7	EA	$ 720.00	=	$ 5,040.00		$ 5,040.00	*
Flared End Section (FES) CSP Size = (unit cost = 6x pipe unit cost)		EA		=	$ -		$ -	*
Flared End Section (FES) CSP Size = (unit cost = 6x pipe unit cost)		EA		=	$ -		$ -	*
End Treatment- Headwall		EA		=	$ -		$ -	*
End Treatment- Wingwall		EA		=	$ -		$ -	*
End Treatment - Cutoff Wall		EA		=	$ -		$ -	*
Curb Inlet (Type R) L=5', Depth < 5'		EA	$ 5,542.00	=	$ -		$ -	*
Curb Inlet (Type R) L=5', 5' ≤ Depth < 10'		EA	$ 7,188.00	=	$ -		$ -	*
Curb Inlet (Type R) L =5', 10' ≤ Depth < 15'		EA	$ 8,345.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', Depth < 5'		EA	$ 7,627.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', 5' ≤ Depth < 10'		EA	$ 7,861.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', 10' ≤ Depth < 15'		EA	$ 9,841.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', Depth < 5'		EA	$ 9,918.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', 5' ≤ Depth < 10'		EA	$ 10,633.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', 10' ≤ Depth < 15'		EA	$ 11,627.00	=	$ -		$ -	*
Curb Inlet (Type R) L =20', Depth < 5'		EA	$ 10,570.00	=	$ -		$ -	*
Curb Inlet (Type R) L =20', 5' ≤ Depth < 10'		EA	$ 11,667.00	=	$ -		$ -	*
Grated Inlet (Type C), Depth < 5'		EA	$ 4,640.00	=	$ -		$ -	*
Grated Inlet (Type D), Depth < 5'		EA	$ 5,731.00	=	$ -		$ -	*
Storm Sewer Manhole, Box Base		EA	$ 11,627.00	=	$ -		$ -	*
Storm Sewer Manhole, Slab Base			$ 6,395.00	=	$ -		$ -	*
Geotextile (Erosion Control)			$ 6.00	=	$ -		$ -	*
Rip Rap, d50 size from 6" to 24"		Tons	$ 80.00	=	$ -		$ -	*
Rip Rap, Grouted		Tons	$ 95.00	=	$ -		$ -	*
Drainage Channel Construction, Size (XX x X)		LF		=	$ -		$ -	*
Drainage Channel Lining, Concrete		CY	$ 570.00	=	$ -		$ -	*
Drainage Channel Lining, Rip Rap		CY	$ 112.00	=	$ -		$ -	*
Drainage Channel Lining, Grass			469.00	=	$ -		$ -	
Drainage Channel Lining, Other Stabilization				=	$ -		$ -	*
				=	$ -		$ -	
[insert items not listed but part of construction plans]				=	$ -		$ -	
* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)		**Section 2 Subtotal**		**=**	**$ 638,795.92**		**$ 638,795.92**	

Round up

Rounded up to 260.

Revised to include Rip Rap.

Revised to include TRM lining as line item.

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining
SECTION 3 - COMMON DEVELOPMENT IMPROVEMENTS (Private or District and NOT Maintained by EPC)**							
ROADWAY IMPROVEMENTS							
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
STORM DRAIN IMPROVEMENTS	(Exception: Permanent Pond/BMP shall be itemized under Section 1)						
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
WATER SYSTEM IMPROVEMENTS							
Water Main Pipe (PVC), Size 8"		LF	$ 64.00	=	$ -		$ -
Water Main Pipe (Ductile Iron), Size 8"		LF	$ 75.00	=	$ -		$ -
Gate Valves, 8"		EA	$ 1,858.00	=	$ -		$ -
Fire Hydrant Assembly, w/ all valves		EA	$ 6,597.00	=	$ -		$ -
Water Service Line Installation, inc. tap and valves		EA	$ 1,324.00	=	$ -		$ -
Fire Cistern Installation, complete		EA		=	$ -		$ -
				=	$ -		$ -
[insert items not listed but part of construction plans]				=	$ -		$ -
SANITARY SEWER IMPROVEMENTS							
Sewer Main Pipe (PVC), Size 8"		LF	$ 64.00	=	$ -		$ -
Sanitary Sewer Manhole, Depth < 15 feet		EA	$ 4,386.00	=	$ -		$ -
Sanitary Service Line Installation, complete		EA	$ 1,402.00	=	$ -		$ -
Sanitary Sewer Lift Station, complete		EA		=	$ -		$ -
				=	$ -		$ -
[insert items not listed but part of construction plans]				=	$ -		$ -
LANDSCAPING IMPROVEMENTS	(For subdivision specific condition of approval, or PUD)						
		EA		=	$ -		$ -
		EA		=	$ -		$ -
		EA		=	$ -		$ -
		EA		=	$ -		$ -
		EA		=	$ -		$ -
** - Section 3 is not subject to defect warranty requirements			**Section 3 Subtotal**	**=**	**$ -**		**$ -**

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining
AS-BUILT PLANS (Public Improvements inc. Permanent WQCV BMPs)		LS		=	$ -		$ -
POND/BMP CERTIFICATION (inc. elevations and volume calculations)		LS		=	$ -		$ -

Revised to include price for As-Built Plans line item.

Total Construction Financial Assurance **$ 661,758.59**

(Sum of all section subtotals plus as-builts and pond/BMP certification)

Total Remaining Construction Financial Assurance (with Pre-Plat Construction) **$ 661,758.59**

(Sum of all section totals less credit for items complete plus as-builts and pond/BMP certification)

Total Defect Warranty Financial Assurance **$ 130,888.88**

(20% of all items identified as (*). To be collateralized at time of preliminary acceptance)

Approvals

I hereby certify that this is an accurate and complete estimate of costs for the work as shown on the Grading and Erosion Control Plan and Construction Drawings associated with the Project.

Engineer (P.E. Seal Required)

Approved by Owner / Applicant — Date

Approved by El Paso County Engineer / ECM Administrator — Date

GALLOWAY RESPONSE

2019 Financial Assurance Estimate Form
(with pre-plat construction)

Updated: 7/16/2019

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining	
SECTION 1 - GRADING AND EROSION CONTROL (Construction and Permanent BMPs)								
* Earthwork								*
less than 1,000; $5,300 min	178	CY	$ 8.00	=	$ 5,300.00		$ 5,300.00	*
1,000-5,000; $8,000 min		CY	$ 6.00	=	$ -		$ -	*
5,001-20,000; $30,000 min		CY	$ 5.00	=	$ -		$ -	*
20,001-50,000; $100,000 min		CY	$ 3.50	=	$ -		$ -	*
50,001-200,000; $175,000 min		CY	$ 2.50	=	$ -		$ -	*
greater than 200,000; $500,000 min		CY	$ 2.00	=	$ -		$ -	*
* Permanent Seeding (inc. noxious weed mgmnt.)	0.35	AC	$ 800.00	=	$ 277.60		$ 277.60	*
* Mulching		AC	$ 750.00	=	$ -		$ -	*
* Permanent Erosion Control Blanket	1,678	SY	$ 6.00	=	$ 10,070.88		$ 10,070.88	*
* Permanent Pond/BMP Construction		CY	$ 20.00	=	$ -		$ -	*
* Permanent Pond/BMP (Spillway)		EA		=	$ -		$ -	*
* Permanent Pond/BMP (Outlet Structure)		EA		=	$		-	
Safety Fence		LF	$ 3.00	=	$ -		$ -	
Temporary Erosion Control Blanket		SY	$ 3.00	=	$			
Vehicle Tracking Control		EA	$ 2.370.00	=	$			
Silt Fence	1,200	LF	$ 2.50	=	$			
Temporary Seeding	0.35	AC	$ 628.00	=	$ 217.92		$ 217.92	
Temporary Mulch		AC	$ 750.00	=	$ -		$ -	
Erosion Bales		EA	$ 25.00	=	$ -		$ -	
Erosion Logs/Straw Waddle		LF	$ 5.00	=	$ -		$ -	
Rock Check Dams		EA	$ 500.00	=	$ -		$ -	
Inlet Protection		EA	$ 167.00	=	$ -		$ -	
Sediment Basin		EA	$ 1,762.00	=	$ -		$ -	
Concrete Washout Basin	1	EA	$ 900.00	=	$ 900.00		$ 900.00	
Road Straw Bale Check Dams	13	EA	$ 100.00	=	$ 1,300.00		$ 1,300.00	
[insert items not listed but part of construction plans]				=	$ -		$ -	
MAINTENANCE (35% of Construction BMPs)				=	$ 1,896.27		$ 1,896.27	
* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)		**Section 1 Subtotal**		**=**	**$ 22,962.67**		**$ 22,962.67**	
SECTION 2 - PUBLIC IMPROVEMENTS *								
ROADWAY IMPROVEMENTS								*
Construction Traffic Control	1	LS	$ 5,000.00	=	$ 5,000.00		$ 5,000.00	*
Gravel Shoulder (135 lbs/cf)	47	CY	$ 50.00	=	$ 2,370.00		$ 2,370.00	*
Aggregate Base Course (135 lbs/cf)	856	CY	$ 50.00		$ 42,806.50		$ 42,806.50	*
Asphalt Pavement (3" thick)		SY	$ 14.00		$ -		$ -	*
Asphalt Pavement (4" thick)		SY	$ 19.00		$ -		$ -	*
Asphalt Pavement (6" thick)	2,568	SY	$ 29.00		$ 74,483.02		$ 74,483.02	*
Asphalt Pavement (147 lbs/cf) _" thick		Tons	$ 88.00	=	$ -		$ -	*
Raised Median, Paved		SF	$ 8.00	=	$ -		$ -	*
Regulatory Sign/Advisory Sign		EA	$ 300.00	=	$ -		$ -	*
Guide/Street Name Sign		EA		=	$ -		$ -	*
Epoxy Pavement Marking	1,700	SF	$ 13.00	=	$ 22,100.00		$ 22,100.00	*
Thermoplastic Pavement Marking		SF	$ 23.00	=	$ -		$ -	*
Barricade - Type 3		EA	$ 200.00	=	$ -		$ -	*
Delineator - Type I		EA	$ 24.00	=	$ -		$ -	*
Curb and Gutter, Type A (6" Vertical)		LF	$ 30.00	=	$ -		$ -	*
Curb and Gutter, Type B (Median)		LF	$ 30.00	=	$ -		$ -	*
Curb and Gutter, Type C (Ramp)		LF	$ 30.00	=	$ -		$ -	*
4" Sidewalk (common areas only)		SY	$ 48.00	=	$ -		$ -	*
5" Sidewalk		SY	$ 60.00	=	$ -		$ -	*
6" Sidewalk		SY	$ 72.00	=	$ -		$ -	*
8" Sidewalk		SY	$ 96.00		$ -		$ -	*
Pedestrian Ramp		EA	$ 1,150.00	=	$ -		$ -	*
Cross Pan, local (8" thick, 6' wide to include return)		LF	$ 61.00	=	$ -		$ -	*
Cross Pan, collector (9" thick, 8' wide to include return)		LF	$ 92.00		$ -		$ -	*
Curb Chase		EA	$ 1,480.00	=	$ -		$ -	*
Guardrail Type 3 (W-Beam)	460	LF	$ 49.00	=	$ 22,540.00		$ 22,540.00	*
Guardrail Type 7 (Concrete)		LF	$ 72.00	=	$ -		$ -	*
Guardrail End Anchorage	4	EA	$ 2,098.00	=	$ 8,392.00		$ 8,392.00	*
Guardrail Impact Attenuator		EA	$ 3,767.00	=	$ -		$ -	*
Sound Barrier Fence (CMU block, 6' high)		LF	$ 78.00		$ -		$ -	*
Sound Barrier Fence (panels, 6' high)		LF	$ 80.00	=	$ -		$ -	*
Electrical Conduit, Size =		LF	$ 16.00	=	$ -		$ -	*
Traffic Signal, complete intersection	1	EA	$ 425,000	=	$ 425,000.00		$ 425,000.00	*

update quantities

Quantities added to FAE.

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining	
				=	$ -		$ -	
[insert items not listed but part of construction plans]				=	$ -		$ -	*
STORM DRAIN IMPROVEMENTS								*
Concrete Box Culvert (M Standard), Size (16 x 6)		LF		=	$ -		$ -	*
18" Reinforced Concrete Pipe		LF	$ 65.00	=	$ -		$ -	*
24" Reinforced Concrete Pipe		LF	$ 78.00	=	$ -		$ -	*
30" Reinforced Concrete Pipe		LF	$ 97.00	=	$ -		$ -	*
36" Reinforced Concrete Pipe		LF	$ 120.00	=	$ -		$ -	*
42" Reinforced Concrete Pipe		LF	$ 160.00	=	$ -		$ -	*
48" Reinforced Concrete Pipe		LF	$ 195.00	=	$ -		$ -	*
54" Reinforced Concrete Pipe		LF	$ 245.00	=	$ -		$ -	*
60" Reinforced Concrete Pipe		LF	$ 288.00	=	$ -		$ -	*
66" Reinforced Concrete Pipe		LF	$ 332.00	=	$ -		$ -	*
72" Reinforced Concrete Pipe		LF	$ 380.00	=	$ -		$ -	*
45" x 29" Reinforced Concrete Elliptical Pipe	259	LF	$ 120.00	=	$ 31,064.40		$ 31,064.40	
18" Corrugated Steel Pipe		LF	$ 84.00	=	$ -		$ -	*
24" Corrugated Steel Pipe		LF	$ 96.00	=	$ -		$ -	*
30" Corrugated Steel Pipe		LF	$ 122.00	=	$ -		$ -	*
36" Corrugated Steel Pipe		LF	$ 147.00	=	$ -		$ -	*
42" Corrugated Steel Pipe		LF	$ 168.00	=	$ -		$ -	*
48" Corrugated Steel Pipe		LF	$ 178.00	=	$ -		$ -	*
54" Corrugated Steel Pipe		LF	$ 260.00	=	$ -		$ -	*
60" Corrugated Steel Pipe		LF	$ 280.00	=	$ -		$ -	*
66" Corrugated Steel Pipe		LF	$ 340.00	=	$ -		$ -	*
72" Corrugated Steel Pipe		LF	$ 400.00	=	$ -		$ -	*
78" Corrugated Steel Pipe		LF	$ 460.00	=	$ -		$ -	*
84" Corrugated Steel Pipe		LF	$ 550.00	=	$ -		$ -	*
Flared End Section (FES) RCP Size = 45" x 29" (unit cost = 6x pipe unit cost)	7	EA	$ 720.00	=	$ 5,040.00		$ 5,040.00	*
Flared End Section (FES) CSP Size = (unit cost = 6x pipe unit cost)		EA		=	$ -		$ -	*
Flared End Section (FES) CSP Size = (unit cost = 6x pipe unit cost)		EA		=	$ -		$ -	*
End Treatment- Headwall		EA		=	$ -		$ -	*
End Treatment- Wingwall		EA		=	$ -		$ -	*
End Treatment - Cutoff Wall		EA		=	$ -		$ -	*
Curb Inlet (Type R) L=5', Depth < 5'		EA	$ 5,542.00	=	$ -		$ -	*
Curb Inlet (Type R) L=5', 5' ≤ Depth < 10'		EA	$ 7,188.00	=	$ -		$ -	*
Curb Inlet (Type R) L =5', 10' ≤ Depth < 15'		EA	$ 8,345.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', Depth < 5'		EA	$ 7,627.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', 5' ≤ Depth < 10'		EA	$ 7,861.00	=	$ -		$ -	*
Curb Inlet (Type R) L =10', 10' ≤ Depth < 15'		EA	$ 9,841.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', Depth < 5'		EA	$ 9,918.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', 5' ≤ Depth < 10'		EA	$ 10,633.00	=	$ -		$ -	*
Curb Inlet (Type R) L =15', 10' ≤ Depth < 15'		EA	$ 11,627.00	=	$ -		$ -	*
Curb Inlet (Type R) L =20', Depth < 5'		EA	$ 10,570.00	=	$ -		$ -	*
Curb Inlet (Type R) L =20', 5' ≤ Depth < 10'		EA	$ 11,667.00	=	$ -		$ -	*
Grated Inlet (Type C), Depth < 5'		EA	$ 4,640.00	=	$ -		$ -	*
Grated Inlet (Type D), Depth < 5'		EA	$ 5,731.00	=	$ -		$ -	*
Storm Sewer Manhole, Box Base		EA	$ 11,627.00	=	$ -		$ -	*
Storm Sewer Manhole, Slab Base		EA	$ 6,395.00	=	$ -		$ -	*
Geotextile (Erosion Control)		SY	$ 6.00	=	$ -		$ -	*
Rip Rap, d50 size from 6" to 24"		Tons	$ 80.00	=	$ -		$ -	*
Rip Rap, Grouted		Tons	$ 95.00	=	$ -		$ -	*
Drainage Channel Construction, Size (XX x X)		LF		=	$ -		$ -	*
Drainage Channel Lining, Concrete		CY	$ 570.00	=	$ -		$ -	*
Drainage Channel Lining, Rip Rap		CY	$ 112.00	=	$ -		$ -	*
Drainage Channel Lining, Grass		AC	$ 1,469.00	=	$ -		$ -	
Drainage Channel Lining, Other Stabilization				=	$ -		$ -	*
				=	$ -		$ -	
[insert items not listed but part of construction plans]				=	$ -		$ -	
* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)		**Section 2 Subtotal**		**=**	**$ 638,795.92**		**$ 638,795.92**	

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction) % Complete	Remaining
SECTION 3 - COMMON DEVELOPMENT IMPROVEMENTS (Private or District and NOT Maintained by EPC)**							
ROADWAY IMPROVEMENTS							
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
STORM DRAIN IMPROVEMENTS	(Exception: Permanent Pond/BMP shall be itemized under Section 1)						
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
				=	$ -		$ -
WATER SYSTEM IMPROVEMENTS							
Water Main Pipe (PVC), Size 8"		LF	$ 64.00	=	$ -		$ -
Water Main Pipe (Ductile Iron), Size 8"		LF	$ 75.00	=	$ -		$ -
Gate Valves, 8"		EA	$ 1,858.00	=	$ -		$ -
Fire Hydrant Assembly, w/ all valves		EA	$ 6,597.00	=	$ -		$ -
Water Service Line Installation, inc. tap and valves		EA	$ 1,324.00	=	$ -		$ -
Fire Cistern Installation, complete		EA		=	$ -		$ -
				=	$ -		$ -
[insert items not listed but part of construction plans]				=	$ -		$ -
SANITARY SEWER IMPROVEMENTS							
Sewer Main Pipe (PVC), Size 8"		LF	$ 64.00	=	$ -		$ -
Sanitary Sewer Manhole, Depth < 15 feet		EA	$ 4,386.00	=	$ -		$ -
Sanitary Service Line Installation, complete		EA	$ 1,402.00	=	$ -		$ -
Sanitary Sewer Lift Station, complete		EA		=	$ -		$ -
				=	$ -		$ -
[insert items not listed but part of construction plans]				=	$ -		$ -
LANDSCAPING IMPROVEMENTS	(For subdivision specific condition of approval, or PUD)						
		EA		=	$ -		$ -
		EA		=	$ -		$ -
		EA		=	$ -		$ -
		EA		=	$ -		$ -
		EA		=	$ -		$ -
** - Section 3 is not subject to defect warranty requirements			**Section 3 Subtotal**	**=**	**$ -**		**$ -**

PROJECT INFORMATION		
Meridian Road & Bent Grass Meadows Drive	6/11/2020	CDRXXX
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost		Total	% Complete	(with Pre-Plat Construction) Remaining
AS-BUILT PLANS (Public Improvements inc. Permanent WQCV BMPs)		LS		=	$ -		$ -
POND/BMP CERTIFICATION (inc. elevations and volume calculations)		LS		=	$ -		$ -

Total Construction Financial Assurance **$ 661,758.59**

(Sum of all section subtotals plus as-builts and pond/BMP certification)

Total Remaining Construction Financial Assurance (with Pre-Plat Construction) **$ 661,758.59**

(Sum of all section totals less credit for items complete plus as-builts and pond/BMP certification)

Total Defect Warranty Financial Assurance **$ 130,888.88**

(20% of all items identified as (*). To be collateralized at time of preliminary acceptance)

Approvals

I hereby certify that this is an accurate and complete estimate of costs for the work as shown on the Grading and Erosion Control Plan and Construction Drawings associated with the Project.

Engineer (P.E. Seal Required)

Approved by Owner / Applicant — Date

Approved by El Paso County Engineer / ECM Administrator — Date

COMMENT RESPONSES – PBMP APPLICABILITY FORM

Galloway responses

Post Construction Stormwater Management Applicability Evaluation Form

This form is to be used by the Engineer of Record to evaluate applicable construction activities to determine if the activities are eligible for an exclusion to permanent stormwater quality management requirements. Additionally Part III of the form is used to identify and document which allowable control measure design standard is used for the structure.

Bent Grass Meadows Drive / Text added

Part I. Project Information	
1. Project Name: Meridian Road Intersection Improvements Text added	
2. El Paso County Project #: CDR-19-004	**3. ESQCP #:**
4. Project Location: Bent Grass Meadows Dr. & Meridian Road	**Project Location in MS4 Permit Area (Y or N): Y**
5. Project Description: Bent Grass Meadows Dr. & Meridian Rd. consists of adding a right turn lane from Bent Grass Meadows Dr. onto Meridian Rd., and also a south bound 960' long acceleration land and 222-foot taper along Meridian Rd. Taper length updated	
If project is located within the El Paso County MS4 Permit Area, please provide copy of this completed form to the Stormwater Quality Coordinator for reporting purposes; and save completed form with project file.	

Part II. Exclusion Evaluation: Determine if Post-Construction Stormwater Management exclusion criteria are met. Note: Questions A thru K directly correlate to the MS4 permit Part I.E.4.a.i (A) thru (K). If Yes, to any of the following questions, then mark Not Applicable in Part III, Question 2.

Questions	Yes	No	Not Applicable	Notes:
A. Is this project a "Pavement Management Site" as defined in Permit Part I E.4.a.i.(A)?		X		This exclusion applies to "roadways" only. Areas used primarily for parking or access to parking are not included.
B. Is the project "Excluded Roadway Development"?				
• Does the site add less than 1 acre of paved area per mile?	X			
• Does the site add 8.25 feet or less of paved width at any location to the existing roadway?		X		
C. Does the project increase the width of the existing roadway by less than 2 times the existing width?	X			For redevelopment of existing roadways, only the area of the existing roadway is excluded from post-construction requirements when the site does not increase the width by two times or more. ***This exclusion only excludes the original roadway area it does NOT apply to entire project.***
D. Is the project considered an aboveground and Underground Utilities activity?		X		Activity can NOT permanently alter the terrain, ground cover or drainage patterns from those present prior to the activity
E. Is the project considered a "Large Lot Single-Family Site"?		X		Must be a single-residential lot or agricultural zoned land, ≥ 2.5 acres

				per dwelling and total lot impervious area < 10 percent.

Questions (cont'd)	Yes	No	Not Applicable	Notes
F. Do Non-Residential or Non-Commercial Infiltration Conditions exist? Post-development surface conditions do not result in concentrated stormwater flow or surface water discharge during an 80th percentile stormwater runoff event.			X	Exclusion does not apply to residential or commercial sites for buildings. A site specific study is required and must show: rainfall and soil conditions; allowable slopes; surface conditions; and ratios of imperviousness area to pervious area.
G. Is the project land disturbance to Undeveloped Land where undeveloped land remains undeveloped following the activity?		X		Project must be on land with no human made structures such as buildings or pavement.
H. Is the project a Stream Stabilization Site?		X		Standalone stream stabilization projects are excluded.
I. Is the project a bike or pedestrian trail?		X		Bike lanes for roadways are not included in this exclusion, but may qualify if part of larger roadway activity is excluded in A, B or C above.
J. Is the project Oil and Gas Exploration?		X		Activities and facilities associated with oil and gas exploration are excluded.
K. Is the project in a County Growth Area?				Note, El Paso County does not apply this exclusion. All Applicable Construction Activity in El Paso County must comply the Post-Construction Stormwater Management criteria.

Part III. Post Construction (Permanent) Stormwater Control Determination		
Questions	**Yes**	**No**
1. Is project an Applicable Construction Activity?		X
2. Do any of the Exclusions (A-K in Part II) apply? **N/A**		
If the project is an Applicable Construction Activity and no Exclusions apply then Post-Construction (Permanent) Stormwater Management is required. Complete the applicable sections of Part IV below and then coordinate signatures for form and place in project file. If the project is not an Applicable Construction Activity, or Exclusion(s) apply then Post-Construction (Permanent) Stormwater Management is NOT required. Coordinate signatures for form and place in project file.		

Part IV: Onsite PWQ Requirements, Documentation and Considerations	Yes	No
1. Check which Design Standard(s) the project will utilize. Standards align with Control Measure Requirements identified in permit Part I.E.4.a.iv.		
A. Water Quality Capture Volume (WQCV) Standard		X
B. Pollutant Removal/80% Total Suspended Solids Removal (TSS)		X
C. Runoff Reduction Standard		X
D. Applicable Development Site Draining to a Regional WQCV Control Measure		X
E. Applicable Development Site Draining to a Regional WQCV Facility	X	
F. Constrained Redevelopment Sites Standard		X
G. Previous Permit Term Standard		X
2. Will any of the project permanent stormwater control measure(s) be maintained by another MS4? If Yes, you must obtain a structure specific maintenance agreement with the other MS4 prior to advertisement.		X
3. Will any of the project permanent stormwater control measures be maintained by a private entity or quasi-governmental agency (e.g. HOA or Special District, respectively)? If Yes, a Private Detention Basin/Stormwater Quality Best Management Practice Maintenance Agreement and Easement must be recorded with the El Paso County Clerk and Recorder.		X

Part V Notes (attach an additional sheet if you need more space)

- Stormwater from the southbound roadside ditch along Meridian Road drains to regional pond MN per the Falcon DBPS.

Text added

regional Pond SR4 (under construction) and

Project design is complete to include the project design, construction plans, drainage report, specifications, and maintenance and access agreements as required. The engineering, drainage considerations and information used to complete these documents is complete, true, and accurate to the best of my belief and knowledge.

Signature and Stamp of Engineer of Record — Date

Post-Construction Stormwater Management Applicability Form has been reviewed and the project design, construction plans, drainage report, specifications, and maintenance and access agreements as required, have been reviewed for compliance with the Post Construction Stormwater Management process and MS4 Permit requirements.

Signature of El Paso County Project Engineer — Date

Sign and stamp

added

COMMENT RESPONSES – GEC

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE

GALLOWAY RESPONSE

COUNTY OF EL PASO, STATE OF COLORADO

GRADING AND EROSION CONTROL PLANS

SPRING 2020

GENERAL CONSTRUCTION NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPLACED AT THE CONTRACTORS EXPENSE AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
3. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
4. ALL BACKFILL, SUB-BASE AND / OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED TO THE SOILS ENGINEERS RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY PCD ENGINEERING DIVISION.
5. ALL STATIONING IS CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE INDICATED.
6. ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO THE EPC ECM APPENDIX K – 1.2C.
7. ALL INTERSECTION ACCESSES TO BE CONSTRUCTED WITH A 25 FOOT SIGHT VISIBILITY TRIANGLES AND THERE SHALL BE NO OBSTRUCTIONS GREATER THAN 18" IN THIS AREA.
8. ALL CULVERT AND STORM PIPES SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE (HDPE), OR REINFORCED CONCRETE PIPE (RCP). ALL CULVERTS SHALL BE PLACED COMPLETE WITH FLARED END SECTIONS. ADEQUACY OF MATERIAL THICKNESS FOR ANY CSP INSTALLED SHALL BE VERIFIED BY OWNERS GEOTECHNICAL ENGINEER TO SUPPORT MINIMUM 50 YEAR DESIGN LIFE. CULVERTS MUST CONFORM TO EPC ECM SECTION 3.32 – CULVERTS.
9. ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED FOR ROADS SHALL BE PER DESIGN REPORT BY OWNERS GEOTECHNICAL ENGINEER. OWNERS GEOTECHNICAL ENGINEER TO BE ON SITE AT TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION PRIOR TO CONSTRUCTION.
10. TYPE M RIP-RAP WITH 4" OF TYPE I GRANULAR BEDDING AND MIRAFI 180N OR EQUAL MAY BE SUBSTITUTED WHERE TYPE L RIP-RAP WITH MIRAFI FW 700 OR EQUAL IS SPECIFIED.
11. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN COMPLIANCE WITH ANY AND ALL APPLICABLE EL PASO COUNTY STANDARDS AND WITH WOODMAN HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
12. ALL POTABLE WATER MAINS SHALL BE AWWA C900-50R18 PVC WITH PUSH-ON SINGLE GASKET TYPE JOINTS AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
13. ALL WATER MAIN FITTINGS SHALL BE MADE FROM GRAY-IRON OR DUCTILE IRON AND FURNISHED WITH MECHANICAL JOINT ENDS. ALL FITTINGS SHALL HAVE A PRESSURE RATING OF 250 PSI AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
14. ALL WATER LINE BENDS, TEES, BLOW-OFFS AND PLUGS AT DEAD-END MAINS SHALL BE PROTECTED FROM THRUST BY USING CONCRETE THRUST BLOCKS AND / OR RODDING AND RESTRAINED PIPE PER THE PAINT BRUSH HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
15. MAXIMUM DEFLECTION OF 8" OR 12" PVC WATER MAIN JOINTS IS 4 DEGREES. CORRESPONDING MINIMUM CURVE RADIUS IS 286'. ADDITIONAL 11.25° OR 22.5° BENDS MAY BE REQUIRED FOR PROPER ALIGNMENT.
16. CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILED AS-BUILTS OF ALL WATER MAIN, STORM SEWER AND SANITARY. SEWER MAIN INSTALLATIONS, INCLUDING ACCURATE DISTANCES OF MAIN LINES, VALVES, FITTINGS, MANHOLES AND LOCATIONS OF WATER AND SEWER SERVICES.
17. SANITARY SEWER PIPE AND FITTINGS: PVC 4" – 8" ASTM D3034, TYPE PSM, SDR 35: PUSH-ON JOINTS AND MOLDED RUBBER GASKETS MAXIMUM HORIZONTAL DEFLECTIONS, AFTER INSTALLATION AND BACK FILLING SHALL NOT EXCEED 3% OF THE PIPE DIAMETER. (MINIMUM CURVE RADIUS IS 100' FOR 8" PVC SANITARY SEWER MAIN)

NOTES UPDATED PER GEC CHECKLIST NOTES

update notes in accordance with GEC Checklist Section 3

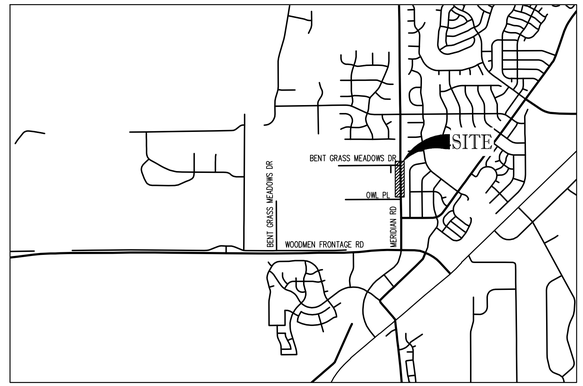
STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFFSITE WATERS, INCLUDING WETLANDS.
2. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A NOTICE TO PROCEED HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF.
5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES IS NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN PRIOR TO IMPLEMENTATION.
7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.
8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70 PERCENT OF PRE-DISTURBANCE LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.
9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME. PRE-EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A WATERS OF THE STATE, UNLESS INFEASIBLE.
11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
12. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF SITE.
13. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.
14. DEWATERING OPERATIONS: UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT MAY NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF.
15. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
16. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
17. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
19. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
20. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
21. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCH FLOW LINE.
24. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT"(TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT"(33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ROCKY MOUNTAIN GROUP AND SHALL BE CONSIDERED A PART OF THESE PLANS.
29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD -PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246-1530
   ATTN: PERMITS UNIT

add date of report

DATE OF REPORT ADDED TO NOTE



VICINITY MAP
NTS

Sheet List Table		
SHEET NUMBER	SHEET DESCRIPTION	SHEET TITLE
1	C0.0	COVER SHEET
2	C1.0	GRADING AND EROSION CONTROL PLAN
3	C2.0	DETAILS

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   A. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   B. CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   C. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   D. CDOT M & S STANDARDS
4. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) – INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

EROSION CONTROL NOTES

1. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF THE CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY CONTROL DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STROMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD – PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246-1530
   ATTN: PERMITS UNIT
2. ALL DISTURBED AREAS TO BE RESEEDED UPON COMPLETION OF OVERLOT GRADING AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED OR WITHIN 60 DAYS, WHICHEVER IS LESS TIME.
3. CONSTRUCTION FENCE AND SILT FENCE OFFSET FOR CLARITY. CONTRACTOR TO ENSURE BMPS ARE PLACED DOWNSTREAM OF DISTURBED AREAS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
4. BENT GRASS ROAD SHALL BE STREET SWEPT AND INSPECTED ON A REGULAR BASIS DURING CONSTRUCTION.

ENGINEER'S STATEMENT

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY AN NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

RONALD G. DENNIS, COLORADO P.E. NO. 0051622 — DATE

OWNER'S STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

CHALLENGER COMMUNITIES, LLC — DATE

EL PASO COUNTY

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/ OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT. FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VAUD FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. — DATE
COUNTY ENGINEER / ECM ADMINISTRATOR

CAUTION – NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE FIELD LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

811 Know what's **below.** **Call** before you dig.

LIST OF CONTACTS

APPLICANT/DEVELOPER
CHALLENGER COMMUNITIES, LLC
13570 NORTHGATE ESTATES DR.
COLORADO SPRINGS, CO 80921
TEL: (719) 598-5190
CONTACT: JIM BYERS
EMAIL: JMBYR@CHALLENGERHOMES.COM

ENGINEER
GALLOWAY & COMPANY, INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, COLORADO 80920
TEL: (719) 900-7220
CONTACT: GRANT DENNIS, P.E.
EMAIL: GRANTDENNIS@GALLOWAYUS.COM

EL PASO COUNTY
EL PASO COUNTY, PLANNING & COMMUNITY DEVELOPMENT
2880 INTERNATIONAL CIRCLE, SUITE 110
COLORADO SPRINGS, COLORADO 80910
TEL: (719) 520-6300

SURVEYOR
GALLOWAY & COMPANY, INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, COLORADO 80920
TEL: (719) 900-7220
CONTACT: LYLE BISSEGGER
EMAIL: LYLEBISSEGGER@GALLOWAYUS.COM

UTILITY REVIEW – WATER/WASTEWATER
WOODMEN HILLS METRO DISTRICT
8046 EASTONVILLE ROAD
FALCON, COLORADO 80831
TEL: (719) 495-2500
CONTACT: JERRY JACOBSON
EMAIL: JERRY@WHMD.ORG

UTILITY REVIEW – GAS
CITY OF COLORADO SPRINGS
1521 HANCOCK EXPY #4801
COLORADO SPRINGS, COLORADO 80903
TEL: (719) 668-8267
CONTACT: RYNE SOLBERG
EMAIL: RSOLBERG@CSU.ORG

ELECTRIC
MOUNTAIN VIEW ELECTRIC
11140 E WOODMEN RD
FALCON, COLORADO 80831
TEL: (719) 495-2283

FIRE DISTRICT
FALCON FIRE PROTECTION DISTRICT
7030 OLD MERIDIAN ROAD
PEYTON, COLORADO 80831
TEL: (719) 495-4050
EMAIL: FALCONFIRE@FALCONFIREPD.ORG

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
GRADING & EROSION CONTROL PLANS
FOR
CHALLENGER COMMUNITIES, LLC

SWC BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 EL PASO COUNTY

#	Date	Issue / Description	Init.
1	04/07/20	REV. PER COUNTY COMMENTS	TJE

Project No:	IAA000001
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

COVER SHEET

C0.0

Sheet 1 of 3

Show VTC locations

VTC Locations added

LOT 1
FALCON RANCHETTES

Added to legend □ Top of Ban□

define line type

OWL PLACE

36" CMP (CRUSHED) INV. 6908.69

CMP (CRUSHED) INV. 6908.48

SANITARY MH RIM: 6917.15

EXIST. ROADSIDE DRAINAGE DITCH

EXIST. POWER POLE

UTILITY & DRAINAGE EASEMENT PLAT BOOK V2 PAGE 15

FOUND #5 REBAR WITH 1-1/2" ALUMINUM CAP STAMPED "PLS 30118"

UTILITY & DRAINAGE EASEMENT PLAT BOOK V2 PAGE 15

20' MOUNTAIN VIEW ELECTRIC EASEMENT BOOK 3320 PAGE 639

60' PUBLIC UTILITY AND DRAINAGE EASEMENT REC. 213713328

SANITARY MH RIM: 6921.

FES 15" RCP INV. 6918.27

EXIST. POWER POLE

MATCHLINE – AA

FES 22" RCP INV: 6910.97

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00

MERIDIAN ROAD
(210' PUBLIC RIGHT OF WAY)
(ASPHALT PAVING, POSTED SPEED = 55 MPH)

STUB

SANITARY MH RIM: 6921.67

LOT 2
BENT GRASS COMMERCIAL
FILING NO. 2A

LOT 1
BENT GRASS COMMERCIAL
FILING NO. 2A

LOT 1
BENT GRASS COMMERCIAL
FILING NO. 1

30' RECIPROCAL ACCESS EASEMENT REC. 213078561 & REC. 213088388

10' PUBLIC UTILITY EASEMENT REC. 213713328

20' PUBLIC UTILITY AND DRAINAGE EASEMENT REC. 213713328

20' PUBLIC UTILITY EASEMENT REC. 213713328

10' PUBLIC UTILITY EASEMENT REC. 213713328

BENT GRASS MEADOWS DRIVE
(80' PUBLIC RIGHT OF WAY)
(ASPHALT PAVING WITH CONC. CURB)

Note in legend changed to Construction □ oundary/limits of distur□ ance

Seeding and mulch added to legend and plan

concrete washout area added to legend and in plan

Show Construction Site Boundaries. If the same as the limits of disturbance, change to "construction boundary/limits of disturbance"

Show locations of seeding and mulching

Show concrete washout area

riprap outlet protection added

Provide outlet protection (i.e. riprap)

FOUND #5 REBAR WITH 1-1/2" ALUMINUM CAP STAMPED "PLS 30118"

EXIST. ROADSIDE DRAINAGE DITCH

EXIST. POWER POLE

MATCHLINE – AA

9+00 10+00 11+00 12+00 13+00 14+00 14+22.72

MERIDIAN ROAD
(210' PUBLIC RIGHT OF WAY)
(ASPHALT PAVING, POSTED SPEED = 55 MPH)

ABANDONED SANITARY LINE PER METRO DISTRICT

SANITARY MH RIM: 6927.50 LINE STUBS NORTH

SANITARY MH RIM: 6933.93

Add a note stating there are no proposed concrete/asphalt batch plants

Note added

THIS SHEET

BENT GRASS MEADOWS DR.

MERIDIAN ROAD

SITE MAP
SCALE: 1" = 600'

N

0 15 30
SCALE: 1"=30'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING FIBER OPTIC LINE
- EXISTING SANITARY SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE LINE
- EXISTING STORM LINE
- PROPOSED STORM PIPE
- FOUND PROPERTY MONUMENT
- EXISTING SANITARY MANHOLE
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING UTILITY MARKER POST
- EXISTING TELECOM PEDESTAL
- EXISTING ELECTRICAL TRANSFORMER
- FIBER OPTIC PULL BOX
- EXISTING FLARED END SECTION
- EXISTING UTILITY POLE
- 6921 EXISTING MINOR CONTOUR
- 6922 EXISTING MAJOR CONTOUR
- 6921 PROPOSED MINOR CONTOUR
- 6922 PROPOSED MAJOR CONTOUR
- 6922.50 PROPOSED SPOT ELEVATION
- 0.45% PROPOSED SLOPE
- PROPOSED 8" THICK STRIPING
- PROPOSED 4" THICK STRIPING
- PROPOSED ASPHALT
- PROPOSED SIGN
- SF SILT FENCE
- LOD LIMITS OF DISTURBANCE
- ECB EROSION CONTROL BLANKET
- EL EROSION LOG CHECK DAM
- PROPOSED FLOW

CONTRACTORS NOTE:

ALL EXISTING UNDERGROUND UTILITIES LOCATIONS APPROXIMATELY SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES CAUSED BY ANY CONSTRUCTION ACTIVITIES CAUSED IF THE UTILITY LOCATE HAS NOT BEEN PERFORMED.

VEGETATION NOTE:

NO NOTABLE VEGETATION IS OBSERVED WITHIN THE LIMITS OF CONSTRUCTION ON THIS SITE. THE EXISTING VEGETATION WITHIN THE LIMITS OF DISTURBANCE CONSISTS OF NATIVE GRASSES AND WEEDS.

CAUTION – NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE FIELD LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

811 Know what's **below.** **Call** before you dig.

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
GRADING & EROSION CONTROL PLANS
FOR
CHALLENGER COMMUNITIES, LLC

SWC BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 EL PASO COUNTY

#	Date	Issue / Description	Init.
1	04/07/20	REV. PER COUNTY COMMENTS	TJE

Project No:	CLH0015.20
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

GRADING AND EROSION CONTROL PLAN

C1.0

Sheet 2 of 3

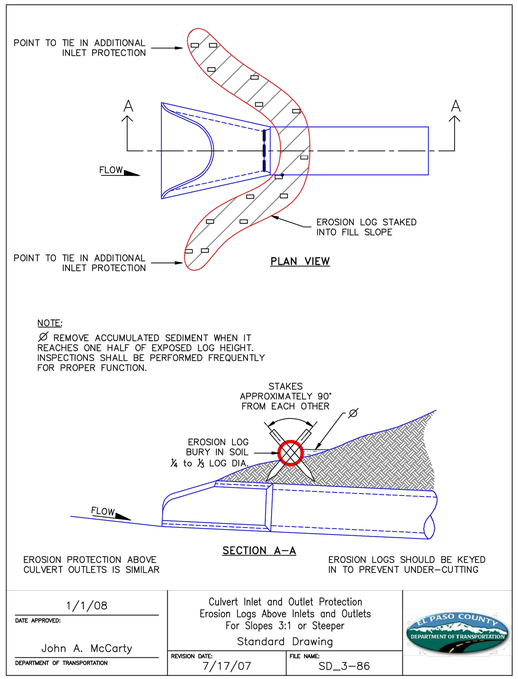
EROSION CONTROL CRITERIA

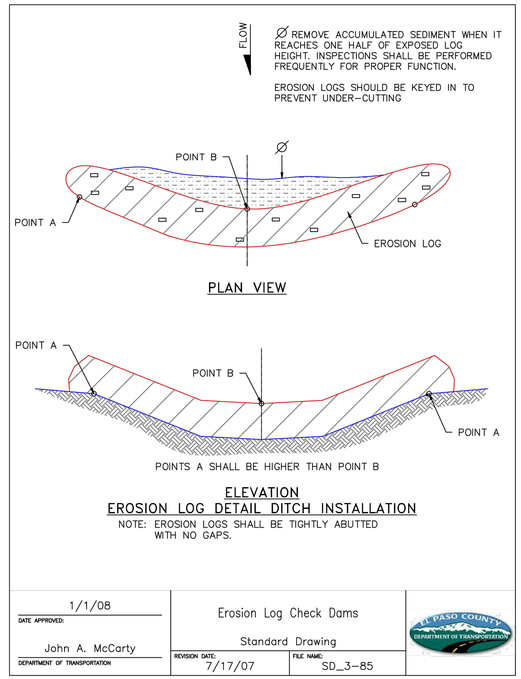
EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IN A MANNER THAT WILL PROTECT PROPERTIES AND PUBLIC FACILITIES FROM THE ADVERSE EFFECTS OF EROSION AND SEDIMENTATION AS A RESULT OF CONSTRUCTION AND EARTHWORK ACTIVITIES WITHIN THE PROJECT SITE.

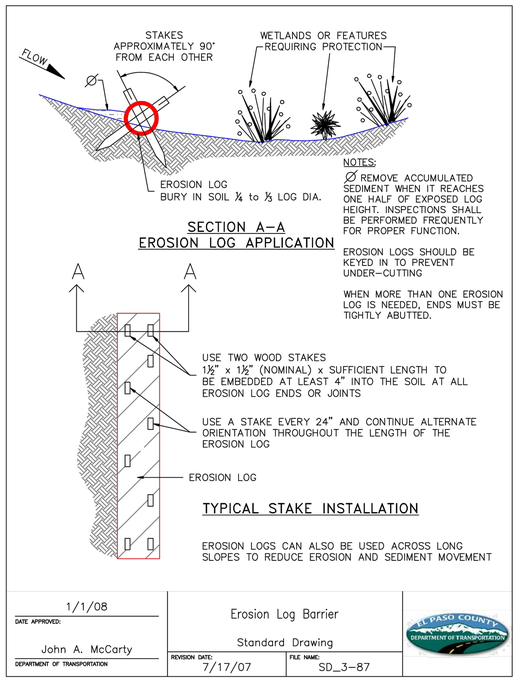
1. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NON-EXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. DURING GRADING OPERATIONS, LOCATE AND SET THE STRAW BALE CHECK DAMS AND SILT FENCES AS SHOWN ON THE EROSION CONTROL PLAN. AT THIS TIME RESEED ALL DISTURBED AREAS WITH AN EL PASO COUNTY APPROVED SEED MIX.
3. SEEDING APPLICATION: DRILLED TO A DEPTH OF 0.25" TO 0.50" INTO SOIL WHERE POSSIBLE. BROADCAST AND RANKED TO COVER ON STEEPER THAN 3:1 SLOPES WHERE ACCESS IS LIMITED OR UNSAFE FOR EQUIPMENT.
4. MULCHING REQUIREMENTS AND APPLICATION: 1.5 TONS PER ACRE NATIVE HAY MECHANICALLY CRIMPED INTO SOIL.
5. THE STRAW BALE CHECK DAMS AND SILT FENCES SHALL BE KEPT IN PLACE AND MAINTAINED UNTIL EROSION AND SEDIMENTATION POTENTIAL IS MITIGATED. REMOVAL OF SILT AND SEDIMENT COLLECTED BY THE STRAW BALES IS REQUIRED ONCE IT REACHED HALF THE HEIGHT OF THE STRAW BALES OR SILT FENCE.
6. DISTURBED SOIL SHALL BE VEGETATED WITHIN 60 DAYS AFTER SUBSTANTIAL FINAL GRADING IS COMPLETE. PROVIDE TEMPORARY VEGETATION TO DISTURBED AREAS THAT WILL HAVE A PERIOD OF EXPOSURE OF 6 MONTHS OR LONGER PRIOR TO FINAL STABILIZATION.
7. ALL FACILITIES, VEGETATION AND OTHER ITEMS REQUIRED BY THE APPROVED FINAL GRADING, EROSION CONTROL AND RECLAMATION PLAN SHALL BE PROPERLY MAINTAINED BY THE OWNERS OF THE PROPERTY. SUCH MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO KEEPING ALL EROSION CONTROL FACILITIES IN GOOD ORDER AND FUNCTIONAL, REPAIRING ANY EROSION DAMAGE THAT OCCURS, KEEPING ALL VEGETATION HEALTHY AND IN GROWING CONDITION AND REPLACING ANY DEAD VEGETATION AS SOON AS PRACTICABLE.
8. ALL SILT FENCES ARE TO BE REGULARLY INSPECTED AND REPAIRED AS NEEDED.
9. THE CONTRACTOR SHALL PROVIDE VEHICLE TRACING CONTROL FACILITIES FOR EACH ENTRANCE / EXIT TO THE SITE. THE CONTRACTOR SHALL SUBMIT A PLAN WHICH WILL ASSURE USAGE OF THE FACILITY BY ALL VEHICLES LEAVING THE SITE.
10. EROSION CONTROL MEASURES SHALL BE CHECKED AFTER EACH STORM EVENT AND REPAIRED WHEN NECESSARY.
11. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION CONTROL FACILITIES IN GOOD WORKING ORDER UNTIL SUCH TIME AS PERMANENT FACILITIES ARE IN PLACE AND THE CONSTRUCTION MANAGER HAS APPROVED THEIR REMOVAL.
12. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
13. THE EROSION CONTROL MEASURES OUTLINED ON THE PLAN ARE THE RESPONSIBILITY OF THE DEVELOPER TO MONITOR AND REPLACE, REGRADE AND REBUILD AS NECESSARY UNTIL VEGETATION IS ESTABLISHED.

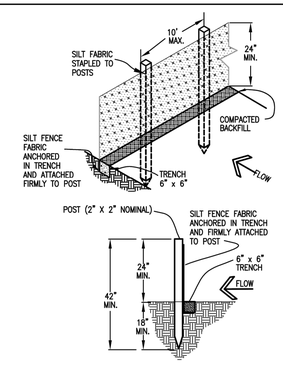
Details for VTC, CWA, ECB and Seeding have been added to plan set

Show VTC Details, CWA Details, ECB Details, and Seeding/Mulching Details









SILT FENCE

SILT FENCE NOTES

INSTALLATION REQUIREMENTS

1. SILT FENCES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

2. WHEN JOINTS ARE NECESSARY, SILT FENCE GEOTEXTILE SHALL BE SPLICED TOGETHER ONLY AT SUPPORT POST AND SECURELY SEALED.

3. METAL POSTS SHALL BE "STUDDED TEE" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD POSTS SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION DIMENSION OF 2 INCHES.

4. THE FILTER MATERIAL SHALL BE FASTENED SECURELY TO METAL OR WOOD POSTS USING WIRE TIES, OR TO WOOD POSTS WITH 3/4" LONG #9 HEAVY-DUTY STAPLES. THE SILT FENCE GEOTEXTILE SHALL NOT BE STAPLED TO EXISTING TREES.

5. WHILE NOT REQUIRED, WIRE MESH FENCE MAY BE USED TO SUPPORT THE GEOTEXTILE. WIRE FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 3/4" LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 6" AND SHALL NOT EXTEND MORE THAN 3' ABOVE THE ORIGINAL GROUND SURFACE.

6. ALONG THE TOE OF FILLS, INSTALL THE SILT FENCE ALONG A LEVEL CONTOUR AND PROVIDE AN AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE. A MINIMUM DISTANCE OF 5 FEET FROM THE TOE OF THE FILL IS RECOMMENDED.

7. THE HEIGHT OF THE SILT FENCE FROM THE GROUND SURFACE SHALL BE MINIMUM OF 24 INCHES AND SHALL NOT EXCEED 36 INCHES; HIGHER FENCES MAY INPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SILT FENCES IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE SILT FENCES SHALL BE PROMPTLY REPAIRED OR REPLACED.

2. SEDIMENT SHALL BE REMOVED FROM BEHIND SILT FENCE WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.

3. SILT FENCES SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED AS APPROVED BY THE CITY.

City of Colorado Springs Stormwater Quality	Figure SF-2 Silt Fence Construction Detail and Maintenance Requirements

3-36

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#	Date	Issue / Description	Init.
1	04/07/20	REV. PER COUNTY COMMENTS	TJE

Project No:	IAA000001
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

DETAILS

C2.0

Sheet 3 of 3

COMMENT RESPONSES – GEC CHECKLIST

✔ Satisfies criteria

X Needs to be addressed

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EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GALLOWAY RESPONSE

GRADING AND EROSION CONTROL PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
1. GRADING AND EROSION CONTROL PLAN			
a	Vicinity map.	Y	✔
b	Adjacent city/town/jurisdictional boundaries, subdivision names, and property parcel numbers labeled.	N/A	✔
c	North arrow and acceptable scale (1"=20' to 1"=100').	Y	✔
d	Legend for all symbols used in the plan. legend updated with missing or added linetype, details, hatches, etc	Y	X
e	Existing and proposed property lines. Proposed subdivision boundary for subdivision projects.	Y	✔
f	All existing structures.	Y	✔
g	All existing utilities.	Y	✔
h	Construction site boundaries. Limits of disturbance same as construction boundary - label changed to address/show this	Y	X
i	Existing vegetation (notes are acceptable in cases where there is no notable vegetation, only grasses/weeds, or site has already been stripped).	Y	✔
j	FEMA 100-yr floodplain.	N/A	N/A
k	Existing and proposed water courses including springs, streams, wetlands, detention ponds, stormwater quality structures, roadside ditches, irrigation ditches and other water surfaces. Show maintenance of pre-existing vegetation within 50 feet of a receiving water.	Y	✔
l	Existing and proposed contours 2 feet or less (except for hillside).	Y	✔
m	Limits of disturbance delineating all anticipated areas of soil disturbance.	Y	✔
n	Identify and protect areas outside of the construction site boundary with existing fencing, construction fencing or other methods as appropriate.	Y	✔
o	Offsite grading clearly shown and called out.	N/A	N/A
p	Areas of cut and fill identified.	N/A	N/A
q	Conclusions from soils/geotechnical report and geologic hazards report incorporated in grading design (slopes, embankments, materials, mitigation, etc.)	Y	✔
r	Proposed slopes steeper than 3:1 with top and toe of slope delineated. Erosion control blanketing or other protective covering required.	Y	✔
s	Stormwater flow direction arrows.	Y	✔
t	Location of any dedicated asphalt / concrete batch plants.	N/A	N/A
u	Areas used for staging, storage of building materials, soils (stockpiles) or wastes. The use of construction office trailers requires PCD permitting.	N/A	N/A
v	All proposed temporary construction control measures, structural and non-structural. Temporary construction control measures shall be identified by phase of implementation to include" "initial," "interim," and "final" or shown on separate phased maps identifying each phase.	N/A	N/A
w	Vehicle tracking provided at all construction entrances/exits. Construction fencing, barricades, and/or signage provided at access points not to be used for construction. VTC added to plan	N/A	X
x	Temporary sediment ponds provided for disturbed drainage areas greater than 1 acre.	N/A	N/A
y	Dewatering operations to include locations of diversion, pump and discharge(s) as anticipated at time of design.	N/A	N/A
z	All proposed temporary construction control measure details. Custom or other jurisdiction's details used must meet or exceed EPC standards. Details for VTC, CWA, ECB and seeding added to plan	Y	X

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EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GRADING AND EROSION CONTROL PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
aa	Any offsite stormwater control measure proposed for use by the project and not under the direct control or ownership of the Owner or Operator.	N/A	N/A
bb	Existing and proposed permanent storm water management facilities, including areas proposed for stormwater infiltration or subsurface detention.	N/A	N/A
cc	Existing and proposed easements (permanent and construction) including required off site easements.	Y	✔
dd	Retaining walls (not to be located in County ROW unless approved via license agreement). Design by P.E. and building permit from Regional Building Department required for walls greater than or equal to 4 feet in height, series of walls, or walls supporting a surcharge.	N/A	N/A
ee	Plan certified by a Colorado Registered P.E., with EPC standard signature blocks for Engineer, Owner and EPC.	Y	✔
ff	Engineer's Statement (for standalone GEC Plan): This Grading and Erosion Control Plan was prepared under my direction and supervision and is correct to the best of my knowledge and belief. Said Plan has been prepared according to the criteria established by the County for Grading and Erosion Control Plans. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this plan. _____ _____ Engineer of Record Signature Date	Y	✔
gg	Engineer's Statement (for GEC Plan within Construction Drawing set): These detailed plans and specifications were prepared under my direction and supervision. Said plans and specifications have been prepared according to the criteria established by the County for detailed roadway, drainage, grading and erosion control plans and specifications, and said plans and specifications are in conformity with applicable master drainage plans and master transportation plans. Said plans and specifications meet the purposes for which the particular roadway and drainage facilities are designed and are correct to the best of my knowledge and belief. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparation of these detailed plans and specifications. _____ _____ Engineer of Record Signature Date	Y	N/A
hh	Owner's Statement (for standalone GEC Plan): I, the owner/developer have read and will comply with the requirements of the Grading and Erosion Control Plan. _____ _____ Owner Signature Date	Y	✔
ii	Owner's Statement (for GEC Plan within Construction Drawing set): I, the owner/developer have read and will comply with the requirements of the grading and erosion control plan and all of the requirements specified in these detailed plans and specifications. _____ _____ Owner Signature Date	Y	N/A

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EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GRADING AND EROSION CONTROL PLAN CHECKLIST

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		Applicant	PCD
jj	El Paso County (standalone GEC Plan): County plan review is provided only for general conformance with County Design Criteria. The County is not responsible for the accuracy and adequacy of the design, dimensions, and/ or elevations which shall be confirmed at the job site. The County through the approval of this document assumes no responsibility for completeness and/ or accuracy of this document. Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual Volumes 1 and 2, and Engineering Criteria Manual, as amended. In accordance with ECM Section 1.12, these construction documents will be valid for construction for a period of 2 years from the date signed by the El Paso County Engineer. If construction has not started within those 2 years, the plans will need to be resubmitted for approval, including payment of review fees at the Planning and Community Development Director's discretion. _____ _____ County Engineer/ECM Administrator Date	Y	✔
2. ADDITIONAL REPORTS/PERMITS/DOCUMENTS			
a	Soils report / geotechnical investigation as appropriate for grading/utilities/drainage/road construction.	Y	
b	Use Agreement/easement between the Owner or Operator and other third party for use of all offsite grading or stormwater control measures, used by the owner or operator but not under their direct control or ownership.	N/A	
c	Floodplain Development Permit	N/A	
d	USACE 404/wetlands permit/mitigation plan	N/A	
e	FEMA CLOMR	N/A	
f	State Engineer's permit/Notice Of Intent to Construct	Y	
g	Stormwater Management Plan (SWMP)		
h	Financial Assurance Estimate (FAE) (signed)	Y	
i	Erosion and Stormwater Quality Control Permit (ESQCP) (signed)	Y	
j	Pre-Development Site Grading Acknowledgement and Right of Access Form (signed)		
k	Conditions of Approval met?	Y	

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EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GRADING AND EROSION CONTROL PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
3. STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS			
1	Stormwater discharges from construction sites shall not cause or threaten to cause pollution, contamination, or degradation of State Waters. All work and earth disturbance shall be done in a manner that minimizes pollution of any on-site or off-site waters, including wetlands.	Y	
2	Notwithstanding anything depicted in these plans in words or graphic representation, all design and construction related to roads, storm drainage and erosion control shall conform to the standards and requirements of the most recent version of the relevant adopted El Paso County standards, including the Land Development Code, the Engineering Criteria Manual, the Drainage Criteria Manual, and the Drainage Criteria Manual Volume 2. Any deviations from regulations and standards must be requested, and approved, in writing.	Y	
3	A separate Stormwater Management Plan (SMWP) for this project shall be completed and an Erosion and Stormwater Quality Control Permit (ESQCP) issued prior to commencing construction. Management of the SWMP during construction is the responsibility of the designated Qualified Stormwater Manager or Certified Erosion Control Inspector. The SWMP shall be located on site at all times during construction and shall be kept up to date with work progress and changes in the field.	Y	
4	Once the ESQCP is approved and a “Notice to Proceed” has been issued, the contractor may install the initial stage erosion and sediment control measures as indicated on the approved GEC. A Preconstruction Meeting between the contractor, engineer, and El Paso County will be held prior to any construction. It is the responsibility of the applicant to coordinate the meeting time and place with County staff.	Y	
5	Control measures must be installed prior to commencement of activities that could contribute pollutants to stormwater. control measures for all slopes, channels, ditches, and disturbed land areas shall be installed immediately upon completion of the disturbance.	Y	
6	All temporary sediment and erosion control measures shall be maintained and remain in effective operating condition until permanent soil erosion control measures are implemented and final stabilization is established. All persons engaged in land disturbance activities shall assess the adequacy of control measures at the site and identify if changes to those control measures are needed to ensure the continued effective performance of the control measures. All changes to temporary sediment and erosion control measures must be incorporated into the Stormwater Management Plan.	Y	
7	Temporary stabilization shall be implemented on disturbed areas and stockpiles where ground disturbing construction activity has permanently ceased or temporarily ceased for longer than 14 days.	Y	
8	Final stabilization must be implemented at all applicable construction sites. Final stabilization is achieved when all ground disturbing activities are complete and all disturbed areas either have a uniform vegetative cover with individual plant density of 70 percent of pre-disturbance levels established or equivalent permanent alternative stabilization method is implemented. All temporary sediment and erosion control measures shall be removed upon final stabilization and before permit closure.	Y	
9	All permanent stormwater management facilities shall be installed as designed in the approved plans. Any proposed changes that effect the design or function of permanent stormwater management structures must be approved by the ECM Administrator prior to implementation.	Y	
10	Earth disturbances shall be conducted in such a manner so as to effectively minimize accelerated soil erosion and resulting sedimentation. All disturbances shall be designed, constructed, and completed so that the exposed area of any disturbed land shall be limited to the shortest practical period of time. Pre-existing vegetation shall be protected and maintained within 50 horizontal feet of a waters of the state unless shown to be infeasible and specifically requested and approved.	Y	

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EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GRADING AND EROSION CONTROL PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
11	Compaction of soil must be prevented in areas designated for infiltration control measures or where final stabilization will be achieved by vegetative cover. Areas designated for infiltration control measures shall also be protected from sedimentation during construction until final stabilization is achieved. If compaction prevention is not feasible due to site constraints, all areas designated for infiltration and vegetation control measures must be loosened prior to installation of the control measure(s).	Y	
12	Any temporary or permanent facility designed and constructed for the conveyance of stormwater around, through, or from the earth disturbance area shall be a stabilized conveyance designed to minimize erosion and the discharge of sediment off site.	Y	
13	Concrete wash water shall be contained and disposed of in accordance with the SWMP. No wash water shall be discharged to or allowed to enter State Waters, including any surface or subsurface storm drainage system or facilities. Concrete washouts shall not be located in an area where shallow groundwater may be present, or within 50 feet of a surface water body, creek or stream.	Y	
14	During dewatering operations of uncontaminated ground water may be discharged on site, but shall not leave the site in the form of surface runoff unless an approved State dewatering permit is in place.	N/A	
15	Erosion control blanketing or other protective covering shall be used on slopes steeper than 3:1.	Y	
16	Contractor shall be responsible for the removal of all wastes from the construction site for disposal in accordance with local and State regulatory requirements. No construction debris, tree slash, building material wastes or unused building materials shall be buried, dumped, or discharged at the site.	Y	
17	Waste materials shall not be temporarily placed or stored in the street, alley, or other public way, unless in accordance with an approved Traffic Control Plan. control measures may be required by El Paso County Engineering if deemed necessary, based on specific conditions and circumstances.	Y	
18	Tracking of soils and construction debris off-site shall be minimized. Materials tracked off-site shall be cleaned up and properly disposed of immediately.	Y	
19	The owner/developer shall be responsible for the removal of all construction debris, dirt, trash, rock, sediment, soil, and sand that may accumulate in roads, storm drains and other drainage conveyance systems and stormwater appurtenances as a result of site development.	Y	
20	The quantity of materials stored on the project site shall be limited, as much as practical, to that quantity required to perform the work in an orderly sequence. All materials stored on-site shall be stored in a neat, orderly manner, in their original containers, with original manufacturer's labels.	Y	
21	No chemical(s) having the potential to be released in stormwater are to be stored or used onsite unless permission for the use of such chemical(s) is granted in writing by the ECM Administrator. In granting approval for the use of such chemical(s), special conditions and monitoring may be required.	Y	
22	Bulk storage of allowed petroleum products or other allowed liquid chemicals in excess of 55 gallons shall require adequate secondary containment protection to contain all spills onsite and to prevent any spilled materials from entering State Waters, any surface or subsurface storm drainage system or other facilities.	Y	
23	No person shall cause the impediment of stormwater flow in the curb and gutter or ditch except with approved sediment control measures.	Y	

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Revised: July 2019

		Applicant	PCD
24	Owner/developer and their agents shall comply with the "Colorado Water Quality Control Act" (Title 25, Article 8, CRS), and the "Clean Water Act" (33 USC 1344), in addition to the requirements of the Land Development Code, DCM Volume II and the ECM Appendix I. All appropriate permits must be obtained by the contractor prior to construction (1041, NPDES, Floodplain, 404, fugitive dust, etc.). In the event of conflicts between these requirements and other laws, rules, or regulations of other Federal, State, local, or County agencies, the most restrictive laws, rules, or regulations shall apply.	Y	
25	All construction traffic must enter/exit the site only at approved construction access points.	N/A	
26	Prior to construction the permittee shall verify the location of existing utilities.	Y	
27	A water source shall be available on site during earthwork operations and shall be utilized as required to minimize dust from earthwork equipment and wind.	Y	
28	The soils report for this site has been prepared by _____ and shall be considered a part of these plans.		
29	At least ten (10) days prior to the anticipated start of construction, for projects that will disturb one (1) acre or more, the owner or operator of construction activity shall submit a permit application for stormwater discharge to the Colorado Department of Public Health and Environment, Water Quality Division. The application contains certification of completion of a stormwater management plan (SWMP), of which this Grading and Erosion Control Plan may be a part. For information or application materials contact: Colorado Department of Public Health and Environment Water Quality Control Division WQCD – Permits 4300 Cherry Creek Drive South Denver, CO 80246-1530 Attn: Permits Unit	Y	
4. Applicant Comments:			
a			
b			
c			

2880 International Circle, Suite 110
Colorado Springs, CO 80910
Phone 719-520-6300
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www.elpasoco.com

EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GRADING AND EROSION CONTROL PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
5. Checklist Review Certifications:			
a	Engineer of Record: The Grading and Erosion Control Plan was prepared under my direction and supervision and is complete and correct to the best of my knowledge and belief. Said Plan has been prepared according to the criteria established by the County for Grading and Erosion Control Plans. _____ _____ Engineer of Record Signature Date		
b	Review Engineer: The Grading and Erosion Control Plan was reviewed and found to meet the checklist requirements except where otherwise noted or allowed by an approved deviation request. _____ _____ Review Engineer Date		

COMMENT RESPONSES – SWMP

Item Numbers refer to SWMP Checklist

Galloway responses

Galloway

STORMWATER MANAGEMENT PLAN

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
FILE #: CDR _____

STORMWATER PERMIT # COR_____
CERTIFICATION #_____

Owner/Developer:
Challenger Communities, LLC
8605 Explorer Drive, Suite 250
Colorado Springs, CO 80920

SWMP Preparer:
Galloway & Company, Inc.
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80918

Contractor:

To be Determined

Text removed

~~SWMP Administrator~~ / Qualified Stormwater Manager:

To be Determined

Date:
November 15, 2019

SWMP Location:
On-Site (Copy) and Challenger Communities, LLC (Original)

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SWMP REPORT REVISION LOG

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I. PROJECT DESCRIPTION

LOCATION

The site is located in the Northwest ¼ and Southwest ¼ of Section 1, Township 13S, Range 65W, of the Sixth Principal Meridian, County of El Paso, State of Colorado. The proposed improvements are located at the intersection of Bent Grass Meadows Drive and Meridian Road, as well as the west side of Meridian Road from Bent Grass Meadows Drive to Owl Place.

DESCRIPTION OF PROPERTY

The project site contains approximately 0.69 acres and includes a portion of Bent Grass Meadows Drive, an 80' R.O.W. Collector, consisting of (1) left turn lane and (1) right turn lane East bound onto Meridian Road. Southbound Meridian Road consists of (2) lanes and (1) deacceleration lane approaching Bent Grass Meadows Drive. Northbound Meridian Road consists of (2) lanes, and (1) left turn lane onto Bent Grass Meadows Drive. An existing roadside ditch runs parallel to Southbound Meridian road along the west side with (3) existing 45" X 29" Elliptical RCP storm pipes run under Bent Grass Meadows Drive at Meridian Road.

CONSTRUCTION ACTIVITY

East bound Bent Grass Meadows Drive is to add a turn lane onto Meridian Road. East bound Bent Grass Meadows Drive will now include (2) left turn lanes and (1) right turn lane. In addition, a 960' acceleration lane with a 222' taper will be constructed along South bound Meridian Road. The (3) existing 45" X 29" Elliptical RCP storm pipes and associated FES' will be relocated to accommodate the additional turn and acceleration lane. Another (2) 45" X 29" Elliptical RCP storm pipes and associated FES' are proposed to be installed to convey additional off-site flows described in the Final Drainage Report. Additionally, the intersection of Bent Grass Meadows Drive and Meridian Road is proposed to be signalized.

Temporary stabilization measures (silt fence) will be installed prior to beginning construction. During construction temporary stabilization measures including inlet protection will be utilized to control stormwater runoff. Once final stabilization is achieved, temporary erosion control measures will be removed.

II. PHASING AND PROPOSE CONSTRUCTION SEQUENCE

PHASING

No phasing plan is proposed for the Meridian Road & Bent Grass Meadows Drive project. All construction improvements will be completed at once.

CONSTRUCTION DOCUMENTATION

Construction drawings are provided with this document showing each of these phases and are intended to be a "living" document used by the SWMP Manager to document construction activities. See section IX "Inspection and Record Keeping" for additional information.

PROPOSED SEQUENCE FOR MAJOR CONSTRUCTION ACTIVITIES

Construction for the development of this project is currently projected to begin in May of 2020. It is estimated that construction activities will be completed by June 2020. Final stabilization is expected in the July of 2020. The anticipated sequence of construction is as follows for Meridian Road & Bent Grass Meadows Drive:

Item 6. update schedule

Dates updated to match LOI

1. Installation of perimeter erosion control measures as shown on the construction drawings.
2. Site Clearing/Grubbing
3. Construct temporary sediment basins as necessary.
4. Rough grading of the site.
5. Installation of new storm pipe.
6. Backfill storm drain pipe trenches.
7. Construct curb/gutter and pavement.
8. Final stabilize ROW.
9. Final erosion control measures as areas are completed
10. Remove construction BMP's

See Section VI "Areas and Volumes" for information on anticipated disturbed area and grading volumes.

III. FINAL STABILIZATION

Final site stabilization will be achieved when all final landscaping and paving is complete and when vegetation density is greater than 70 percent of pre-disturbance density over its entire area. All final stabilization on the site will be of a permanent nature. All temporary BMPs will be

removed upon completion of construction. It is the responsibility of the contractor to remove all dirt and garbage from the site.

Note added

Item 26. Add a note stating that this project does not rely on control measures owned or operated by another entity.

IV. PRE-DEVELOPMENT CONDITIONS & SOILS

FLOODPLAIN

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map number 08041C0553G, effective December 7, 2018, the project site is located within Zone X. Zone X is described as areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance-flood (See Appendix for the FEMA FIRM Exhibit).

EXISTING VEGETATION

The site is currently undeveloped and has been used as a pasture for many years. Vegetation consists of native grasses/weeds that have been heavily grazed for years. There is no brush or trees within the area to be graded. Ground cover is estimated at 70% density. Ground cover was determined through visual inspections (site visits) and aerial imagery.

EXISTING DRAINAGE PATTERNS

In the existing conditions, runoff from the west half of Meridian Road near Bent Grass Meadows Drive drains directly into the roadside channel, which flows south at an average slope of 1.75%. The majority of the channel in this area is triangular in shape with a depth of approximately 3 feet.

There are also three existing 45” x 29” elliptical RCP’s that run beneath Bent Grass Meadows Drive. The Federal Highway Administration’s HY-8 program was used to analyze the culvert and design the proposed culverts in the future conditions. The calculations included in Appendix C show that the existing culverts can convey approximately 166 cfs before flow begins to overtop Bent Grass Meadows Drive. All of the included calculations show that the culverts and channel are clearly vastly undersized and will need to be improved by El Paso County in the future to properly convey the flows outlined in the DBPS.

EXISTING SLOPES

Existing slopes are around 1.75% flowing south.

EXISTING SOIL TYPES

Soil data for Bent Grass Residential was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey.

The following table summarizes the characteristics of the soil type:

Soil	Hydro Group	Shrink/Swell Potential	Permeability	Surface Runoff Potential	Erosion Hazard
19—Columbine gravelly sandy loam, 0 to 3 percent slopes	A	Low	High	Very Low	Slight

The existing soil types have a slight potential for erosion which can be mitigated by employing appropriate downstream construction BMP's before/during/after construction to limit potential impacts to stormwater discharges. The potential impacts are sediment discharge into the existing wet weather conveyance and proposed drainage system. Sediment should not be allowed to enter these existing and proposed facilities and can be mitigated by constructing small temporary sediment basins at low points prior to discharge into the systems. Based upon the location of the different soil types and type of construction, the contractor shall employ the most appropriate method of erosion control measures based on the El Paso County/City of Colorado Springs Drainage Criteria Manual, Vol. 2 or as directed by the SWMP administrator or his representative.

change to "Qualified Stormwater Manager"

Title changed

More detailed soils information can be found in the SCS soils survey for El Paso County.

V. DESCRIPTION OF POTENTIAL POLLUTANTS

Potential sources of sediment to stormwater runoff include earth moving and concrete activities associated with grading and landscaping.

Potential pollutants and sources, other than sediment, to stormwater runoff include Trash, debris, line transfer, Dewatering, fueling and equipment failure.

A dewatering permit is not required

Construction activities produce many different kinds of pollutants which may cause storm water contamination problems. Grading activities remove rocks, vegetation and other erosion controlling surfaces, resulting in the exposure of underlying soil to the elements. Because the soil surface is unprotected, soil and sand particles are easily picked up by wind and/or washed away by rain or other water sources.

The following sections highlight the potential sources of pollution at the Project Site and list the "Best Management" strategies that will be used to prevent migration of pollution offsite. Chemical materials stored indoors or that have no reasonable chance of impacting storm water quality will not be discussed in this plan.

Materials of significance stored on the project site include:

- Sediment
- Concrete Washout
- Cement
- Trash & Debris
- Sanitary Wastes
- Fuels & Oils

WIND EROSION & DUST CONTROL

Pollutant: Sediment Best Management Strategies:

- Daily inspections will occur for areas experiencing excessive winds, vehicle traffic, or precipitation events.
- Water trucks will spray down dust on the project Site as needed to not impact adjacent properties.
- Attention will be given to prevent the over use of water in dust control operations to minimize any muddying of the surface and possible sediment transportation.

VEHICULAR TRANSPORT

Pollutant: Sediment Tracking Best Management Strategies:

- Construct a stabilized construction entrance to provide ingress and egress of the site.
- Restrict access to the stabilized construction entrance.
- Fencing will be erected if problems with access control are evident.

- Maintain track out pads by fluffing up the rock material or by adding additional rock as needed.
- Inspect, sweep and clean adjacent streets where track out is evident.

STOCKPILES

Pollutant: Sediment Best Management Strategies:

- Locate stockpiles clear of any water flow paths.
- Locate stockpiles within the property boundary.
- Stockpiles will have erosion control devices as needed installed around the base to prevent the migration of soil.
- Topsoil stock piles and disturbed portions of the site where construction activity temporarily ceases for at least 14 days will be stabilized with temporary seed and mulch no later than 14 days from the last construction activity in the area.

GRADING, TRENCHING, EXPORT/IMPORT

Pollutant: Sediment Best management Strategies:

- Earth moving will be minimized by the engineering balancing of the site.
- Disturbed portions of the site where construction activity temporarily ceases for at least 14 days will be stabilized with temporary seed and mulch no later than 14 days from the last construction activity in the area.
- Seed bed preparation is not required if soil is in loose condition.
- Prior to seeding, fertilizer shall be applied to each acre to be stabilized in accordance with the manufacturer's specifications.
- If required seeding areas shall be mulched with straw to a uniformed cover. The straw mulch is to be tacked into place by a disk with blades set nearly straight.
- A site specific erosion control drawing has been developed showing the location of Best Management practices to be used during site construction.
- Where indicated on the erosion control plan, Best Management Practices will be installed.
- Material shall be in accordance with the plans and specifications and all construction shall be provided in accordance with the manufacturer's specifications.
- All BMP's will be inspected bi-weekly and cleaned/maintained as required.

WASTE, RESIDUAL CONCRETE

Pollutant: Concrete, paint, and Phosphoric Acid Best Management Strategies:

- A cleanup and washout area will be designated and posted.
- Subcontractors will be instructed on the locations and importance of the washout and cleanup areas. No on-site disposal is allowed.
- Instruct subcontractors to remove waste for which proper onsite disposal facilities are not provided back to their own facilities for ultimate transport, storage & disposal.
- Subcontractors and subcontractor employees are held responsible for improper washout.

SANITARY FACILITIES, TRASH CONTAINERS & LITTERING

Pollutant: Bacteria, Ammonia, Trash Best Management Strategies:

- Portable facilities will be regularly serviced to prevent excessive waste containment and overflow.
- All waste materials will be collected and stored in a container which will meet all local and any state solid waste management regulations.
- Trash dumpsters will be emptied prior to becoming 90% full or when debris control becomes an issue.
- Employees will be instructed on the importance of recycling and waste management, and will be held responsible for improper waste management.

FUELING, HAZARDOUS MATERIALS, EQUIPMENT LEAKAGE, FERTILIZER

Pollutant: Petroleum Hydrocarbons, Ethylene Glycol, Sediment Best Management Strategies:

- MSDS sheets will be maintained in the project trailer for all onsite materials
- All dry materials such as cement will be covered and protected from rain.
- Secondary containment will be provided for stored fuel, oil, paint and any material classified as hazardous.
- Subcontractors are responsible for hazardous waste removal back to their own facilities for ultimate transportation, storage and disposal.
- Supplies will be kept onsite as necessary to control any potential spill.
- Employees will be held responsible for any illegal dumping.

- Seals will be checked by a qualified professional on all equipment and containers containing significant materials that could contribute potential pollutants and will be replaced as necessary.
- Equipment will be inspected by a qualified professional.
- Drip pans will be available for minor leaks and during fueling operations.
- Fueling nozzles, gauges, hoses, seals, and emergency shutoff valves will be inspected for leaks prior to use.
- Under no circumstances during fueling will the fueling hose/nozzle be left unattended.
- Fertilizers used will be applied only in the minimum amounts recommended by soil tests.
- Once applied, fertilizers will be worked into the soil to limit exposure to storm water.
- Stored fertilizer will be protected from exposure to precipitation and storm water runoff.

DEWATERING – not needed.

This shown for information only Pollutant: Sediment, Oil and/or Grease and Phosphoric Acid Best Management Strategies:

All dewatering will be filtered through rock and/or woven geo mesh fabric.

All dewatering will be tested for Pollutants per state guidelines weekly.

CONCRETE AND ASPHALT BATCH PLANT – not needed.

This shown for information only There are no existing batch plants located on this project site and there are no proposed batch plants in the future.

DRILLING SLURRY FOR DRILLING PIERS. – not needed.

This is shown for information only. No drilling slurry is allowed to be deposited onto the job site. All drilling slurry shall be collected and pumped into an on-site frac tank and shall be disposed of off-site.

There are no major potential pollutants anticipated to be used on the site.

ADDITIONAL (NON-STRUCTURAL) BEST MANAGEMENT PRACTICES FOR SEDIMENT:

1. Earth moving will be minimized by the engineering balancing of the site.

2. Disturbed portions of the site where construction activity temporarily ceases for at least 14 days will be stabilized with temporary seed and mulch no later than 14 days from the last construction activity in the area.
3. Seed bed preparation is not
4. required if soil is in loose condition.
5. Prior to seeding, fertilizer shall be applied to each acre to be stabilized in accordance with the manufacturer's specifications.
6. If required seeding areas shall be mulched with straw to a uniformed cover. The straw mulch is to be tacked into place by a disk with blades set nearly straight.
7. A site-specific erosion control drawing has been developed showing the location of Best Management practices to be used during site construction.
8. Where indicated on the erosion control plan, Best Management Practices will be installed.
9. Material shall be in accordance with the plans and specifications and all construction shall be provided in accordance with the manufacturer's specifications.
10. All BMP's will be inspected bi-weekly and cleaned/maintained as required.

VI. AREAS AND VOLUMES

The site consists of 0.69 acres. 0.69 acres are expected to be disturbed.

The unadjusted cut and fill quantities as of the writing of this report are listed below:

Cut Volume = 98.22 Cubic Yards

Fill Volume = 61.25 Cubic Yards

Net Volume = 36.96 Cubic Yards (Cut)

Note: The Total disturbed area shall be updated on the SWMP as changes occur.

VII. APPROPRIATE CONTROLS AND MEASURES

Also refer to attached Erosion and Sediment Control notes and plans included in the site plans

MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL

All work will occur inside the limits of construction per the erosion Control Site Plan.

PHASE CONSTRUCTION ACTIVITY The sequence for the installation and removal of erosion and sediment control measures is as follows: Perimeter control measures (silt barriers and fencing) installed at designated areas as noted on the site plans (Exhibit 1), cleaning of street surfaces

during construction if applicable, site grading, installation of utilities, paving final and grading, installation of sod or other vegetation, removal of temporary practices and perimeter controls, and site cleanup.

CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT

Offsite stormwater flows adjacent to this project site from the East Tributary of Jimmy Camp Creek. Reconstruction of the East Tributary north of this site was performed under a separate permit. On-site stormwater will be directed to detention ponds that will function as sedimentation basins so that no sediment enters the downstream receiving waters into the East Tributary.

STABILIZE SOILS

No disturbed area which is not actively being worked shall remain denuded for more than 14 calendar days unless otherwise authorized by the director. Temporary cover by seeding or mulching should be provided on areas which will be exposed for a period greater than 14 days before permanent stabilization can be achieved. Permanent cover should be provided on all areas as soon as possible, by means of seeding and mulching, straw or hay mulch is required. All soil stock piles and borrow areas must protected with silt fence within 14 days after grading. All slopes within the project limits that are found to be eroding excessively within two years of permanent stabilization shall be provided additional slope stabilization methods such as seeding and mulching. Water is to be used for dust control. The Contractor will prevent the escape of this water and any sediment it may carry from the construction site.

PROTECT SLOPES

Temporary stabilization will include the installation of silt fences on level contours spaces at 10-20 foot intervals. Slopes will be seeded and covered with hay, straw or erosion control blankets on slopes greater than 3:1 as needed to provide for temporary stabilization until vegetation is permanently established. All slopes within the project limits that are found to be eroding excessively within two years of permanent stabilization shall be provided additional slope stabilization methods such as seeding and mulching. Where slopes are steeper than 3:1 erosion control blankets (per specification requirements) will be utilized for final stabilization.

PROTECT STORM DRAIN INLETS

Inlet protection will be installed as soon as storm drain inlets are installed and before land disturbance activities begin in areas with existing storm drain systems. At the Contractor's

discretion, additional temporary erosion control practices to include rock bags and sand bag barriers may be installed to prevent sediment movement. Inlet protection will include rock bags erosion logs curb inlet sediment filters where an overflow capacity is necessary to prevent excessive ponding in front of the curb inlet. Concrete block and wire screen inlet protection if used detail will be included Appendix prior to installation, will be used where heavy flows are expected and where an overflow capacity is necessary to prevent excessive ponding around the inlet. Inlet protection devices will be inspected and accumulated sediment will be removed as needed.

ESTABLISH PERIMETER CONTROLS AND SEDIMENT BARRIERS

Temporary stabilization will include the installation of silt fences on the downslope perimeter of project area. The silt fence will be trenched in on the uphill side 6 inches deep and 6 inches wide as detailed in the silt fence exhibit. Sediment will be removed when it reaches 1/3 the height of the fence. Silt fence will be inspected and replaced or repaired as needed.

RETAIN SEDIMENT ON-SITE

Temporary sediment traps shall be installed to detain sediment laden runoff from small watersheds for a period long enough to allow sediment to settle before discharge into receiving waters. For small drainage locations smaller sediment traps should be used. At a minimum, silt fences, vegetative buffer strips or equivalent sediment controls are required for all down-slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction. The use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal will be utilized. Sediment traps will be checked regularly for sediment cleanout. Sediments shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Sediment shall be disposed in suitable areas and in such a manner that will not erode or cause sedimentation problems. The gravel outlets will be checked regularly for sediment buildup which will prevent damage. If the gravel is clogged by sediment, it shall be removed and cleaned or replaced.

An alternate to sediment traps are temporary sediment basins.

ESTABLISH STABILIZED CONSTRUCTION EXITS

75 Length changed

The construction entrance will be established in the entry points of roads. The construction entrance will be at least 50 feet in length and approximately 12 feet wide and graded so runoff does not leave the site. The aggregate will be established at 8 inches thick on top of 4 inch minimum thick free draining material on top of geotextile and will consist of Type G dense graded material. A stabilized stone pad with a filter fabric under liner will be placed at points of vehicular ingress and egress.

ADDITIONAL BMP'S BMP SCHEDULE:

All Sediment and Erosion control BMP's (detailed below and only on BMP site map and details if utilized onsite) will be installed prior to any excavation or demolition and will be coordinated with the construction schedule. As construction changes and new temporary BMP's are needed to control sediment and erosion temporary BMP's will be installed within 24 hours of inspection report.

RECOMMENDED BMP'S: ALL RECOMMENDED BMP'S WILL BE INSTALLED PRIOR TO EXCAVATION NEAR ANY SENSITIVE AREAS.

CULVERT INLET PROTECTION will be used to protect existing and new culvert inlets. Inlet Protection Detail will be included in Appendix before using onsite. Removal of this BMP will occur only after vegetation is established to a minimum of 70% pre construction coverage and after removal of BMP all sediment builds up will be removed and the area exposed shall be seeded.

SILT FENCE is to be installed in sensitive areas to protect stream channels, pond, and overland runoff. On this site it will be used to protect runoff from the slip pits. See Silt Fence Detail. Removal of this BMP will occur only after vegetation is established to a minimum of 70% pre construction coverage and after removal of BMP all sediment builds up will be removed and the area exposed shall be seeded.

VEHICLE TRACKING CONTROL is needed at the main construction entrance location. Vehicle tracking control shall be installed at the edge of the construction staging area where construction vehicles regularly exit onto existing asphalt road. If sediment tracking occurs it will be cleaned within 24 hours.

See Vehicle Tracking Control Detail in Grading & Erosion Control Drawings. Removal of this BMP will occur only after project is substantially complete and is ready for seeding operations; the area will then be seeded per specification with the rest of the project.

CHECK DAMS (rip rap) will be used to reduce storm water velocities in drainage channels during construction as a temporary measure until permanent stabilization can be created and vegetation has been established. Check Dam Detail will be included in the the Appendix before using onsite. Removal of this BMP will occur only after vegetation is established to a minimum of 70% pre construction coverage and after removal of BMP all sediment build-up will be removed and the area exposed shall be seeded.

PORTABLE TOILETS: Portable toilets are brought in from a service contractor and will be maintained in accordance with standard waste disposal practices using vacuum trucks and place on stable ground to minimize risk of spillage. All portable toilets will be kept a minimum of 500' from any waterway.

WASTE DISPOSAL: If needed Roll offs will be utilized for standard construction waste. A qualified contractor will remove waste weekly and take to an appropriate dump site off this project.

PERMANENT BMP'S:

REVEGETATION: During construction any disturbed area not being currently worked left dormant longer than 14 days will be re-vegetated per specification with native seed and mulched and crimped with weed free straw.

All BMPs shall be installed and maintained in accordance with the most recent Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual.

VIII. MATERIALS HANDLING AND SPILL PREVENTION

MATERIAL HANDLING AND WASTE MANAGEMENT

The site will use a private refuse collector that will remove litter twice weekly. No less than one litter receptacle will be present at the construction site. In the event that unusual items such as tanks, cylinders, unidentified containers, etc. which could contain potentially hazardous materials are discovered or disturbed, the Fire and Rescue services will be notified. Litter and debris will be picked up and disposed of properly daily. Temporary toilet facilities will be located 500 feet away from any storm drain inlets and all waters of the state.

ESTABLISH PROPER BUILDING MATERIAL STAGING AREAS

A designated staging area will be used, location to be determined based on available space in the field and plans will be redline. The staging area will be contained per SWMP guidelines. All Equipment and Materials will be brought into the site as needed.

DESIGNATE WASHOUT AREAS

A concrete washout will be installed to detail as shown on the Construction Drawings and will be placed more than 500 feet away from any waters of the state.

ESTABLISH PROPER EQUIPMENT/VEHICLE FUELING AND MAINTENANCE PRACTICES

During construction the site will be exposed to operation and maintenance of construction equipment. The contractor shall be responsible for all activities such as fueling, oil changing, lubrication and repair which require use of petroleum products. Such products shall be transported to and from the site in special trucks equipped for that purpose. No waste petroleum products, rags, residue, or equipment parts shall be left on site. In the event of a spill or leak, causing soil to be contaminated, that soil shall be excavated placed in sealed barrels and removed from the site for transport to an approved location for disposal.

CONTROL EQUIPMENT/VEHICLE WASHING

This activity will not be allowed onsite.

ANY ADDITIONAL BMPS

Additional BMP's will be added to this SWMP as needed.

ALLOWABLE NON-STORMWATER DISCHARGE MANAGEMENT

There are no visible natural springs or irrigation, or other non-stormwater discharges anticipated to be encountered.

SELECTING POST CONSTRUCTION BMP'S

Post Construction BMPs. Re-vegetation including seeding, mulching and erosion control blanket will be final BMP's. Permanent stabilization will be achieved with 70% pre construction vegetative establishment.

SPILL PROVENTION AND CONTROL PLAN

The SITE SUPERINTENDENT will act as the point of contact for any spill that occurs at this jobsite. The project manager will be responsible for implementation of prevention practices, spill containment / cleanup, worker training, reporting and complete documentation in the event of a spill. The ECO shall immediately notify the Owner, /Construction Manager, STATE and the Local Fire Department in addition to the legally required Federal, State, and Local reporting channels (including the National Response Center, 800.424.8802) if a reportable quantity is released to the environment.

SPILL PREVENTION AND BEST MANAGEMENT PRACTICES

This section describes spill prevention methods Best Management Practices (BMP) that will be practiced to eliminate spills before they happen.

- Equipment Staging and Maintenance: Store and maintain equipment in a designated area Reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. Use secondary containment (drain pan) to catch spills when removing or changing fluids. Use proper equipment (pumps, funnels) to transfer fluids Keep spill kits readily accessible Check incoming vehicles for leaking oil and fluids. Transfer used fluids and oil filters to waste or recycling drums immediately following generation. Inspect equipment routinely for leaks and spills Repair equipment immediately, if necessary, implement a preventative maintenance schedule for equipment and vehicles.
- Fueling Area: Perform fueling in designated fueling area minimum 50’ away from federal waters Use secondary containment (drain pan) to catch spills Use proper equipment (pumps, funnels) to transfer fluids Keep spill kits readily accessible Inspect fueling areas routinely for leaks and spills Hazardous Material Storage Areas Reduce the amount of hazardous materials by substituting non-hazardous or Less hazardous materials.
- Hazardous Material Storage Areas: Minimize the quantity of hazardous materials brought onsite Store hazardous materials in a designated area away from drainage points.

- Unexpected Contaminated Soil and Water: Perform all excavation activities carefully and only after the Owner/Construction Manager directed any activities.

SPILL CONTAINMENT METHODS

The following discussion identifies the types of secondary containment that will be used in the event of a spill. The Table below summarizes the containment methods for each potential source.

- Equipment Staging and Maintenance Area: An equipment leak from a fuel tank, equipment seal, or hydraulic line will be contained within a spill containment cell placed beneath all stationary potential leak sources. An undetected leak from parked equipment will be cleaned up using hand shovels and containerized in a 55-gallon steel drum for offsite disposal.
- Fueling Area: A small spill during fueling operations will be contained using fuel absorbent pads at the nozzle. The transfer of fuel into portable equipment will be performed using a funnel and/or hand pump and a spill pad used to absorb any incidental spills/drips. Any leaking tanks or drums will have fluids removed and transferred to another tank, drum, or container for the fluids. A spill response kit will be located near the fueling area or on the fuel truck for easy access. The spill response kit will include plastic sheeting, tarps, over pack drums, absorbent litter, and shovels.
- Hazardous Material Storage Area: A spill from containers or cans in a hazardous material storage area will be contained within the storage cabinet these materials are kept in.
- Unexpected Contaminated Soil: If contaminated soil is encountered during the project, the Owner/Construction Manager will be notified immediately. Small quantities of suspected contaminated soil will be placed on a 6-mil plastic liner and covered with 6-mil plastic. A soil berm or silt fence will be used to contain the stockpile and prevent migration of contaminated liquids in the soil.

SPILL PREVENTION AND CONTAINMENT METHODS

Potential Spill Source	Response Method
Equipment Staging and Maintenance Area	Spill containment pad, spill kit, pumps, funnels

Fueling Area (site equipment only)	Spill containment pad, spill kit, pumps, funnels
Hazardous Material Staging Area	Spill containment pad, spill kit, pumps, funnels
Unexpected Contaminated Soil	Plastic liner, plastic cover, soil berm, hay bales, lined super sacks

SPILL COUNTERMEASURES

Every preventative measure shall be taken to keep contaminated or hazardous materials contained. If a release occurs, the following actions shall be taken:

1. Stop the Spill: The severity of a spill at the site is anticipated to be minimal as large containers/quantities of Hazardous Materials (HM) are not anticipated. The type of spill would occur while dispensing material at the HM storage facility and would likely be contained in secondary containment. Thus, the use spill kits or other available absorbent materials should stop the spill.
2. Warn Others: Notify co-workers and supervisory personnel of the release. Notify emergency responders if appropriate. For site personnel, an alarm system will consist of three one second blasts on an air horn sounded by the person discovering a spill or fire. In the event of any spill, the Superintendent and Project Manager shall be notified if the spill is 5 gallons or more the STATE will be contacted along with the Fire Department.
3. Isolate the Area: Prevent public access to the area and continue to minimize the spread of the material. Minimize personal exposure throughout emergency response actions.
4. Containment: A spill shall only be contained by trained personnel and if it is safe to do so. DO NOT PLACE YOURSELF IN DANGER. Attempt to extinguish a fire only if it is in the incipient stage; trash can size or smaller. For larger spills, wait for the arrival of emergency response personnel and provide directions to the location of the emergency.
5. Complete a Spill and Incident Report: For each spill of a Hazardous Material a spill and incident report shall be completed and submitted to the Owner/Construction Manager and if applicable to the Engineer and the State of Colorado Department of Public Health and Environment

X. RECEIVING WATERS

The project site is located within the West Falcon Tributary. Stormwater from this site drains to an existing unnamed tributary to Black Squirrel Creek No. 2 that routes to a regional detention pond

designated as Detention Pond WU South. The detention pond outfalls back into the unnamed tributary to Black Squirrel Creek No. 2 that then continues to flow into Black Squirrel Creek.

Stream Crossing – No stream crossing is required for this development. A wet weather conveyance crossing is required. See “Floodway” in “Pre-Development Conditions & Soils” for additional information on stream crossing.

IX. INSPECTION AND RECORD KEEPING

The project is subject to inspections by the Colorado Division of Public Health and Environment (CDPHE), the Environmental Protection Agency (EPA), and El Paso County at any time. Title changed Inspection of the stormwater management system shall be performed, by the SWMP Administrator, at least every 14 calendar days and after the occurrence of precipitation or snow melt event that may cause noticeable erosion or run-off. Time span greater than 14 calendar days is a violation of the CDPS permit.

Change to "Qualified Stormwater Manager" Title changed

SWMP ADMINISTRATOR

The individual(s), position, or title responsible for developing, implementing, maintaining, and revising the SWMP is to be determined upon award of the project. The individual listed as the Erosion Control Supervisor shall fill out the information below and place in the on-site copy before beginning installation of the BMPs for this site and notify the County of the appropriate contact information.

Title changed

SWMP Administrator Name:

Cell Phone:

Office Phone:

Email:

INSPECTION SCHEDULES

Inspections of the stormwater management system are required at least every 14 calendar days and within 24 hours after any precipitation or snowmelt event that causes surface runoff. A more frequent inspection schedule may be necessary to ensure that BMPs continue to operate as designed.

Differences or modifications in the field from the approved SWMP are required to be made within 72 hours site changes are observed. The SWMP shall be onsite at all times when onsite construction activity is occurring.

INSPECTION SCOPE

The construction site perimeter, all disturbed areas, material and/or waste storage areas that are exposed to precipitation, discharge locations, and locations where vehicles access the site shall be inspected for evidence of, or the potential for pollutants leaving the construction site boundaries or discharging to State Waters. All erosion and sediment control practices identified in the SWMP shall be evaluated to ensure that they are maintained and operating correctly.

INSPECTION REPORT

A thorough record of inspection shall be maintained and identify any incidents of non-compliance with the SWMP. Inspection records shall be retained for three years from expiration or inactivation of permit coverage. Federal, State, local authority reserves the right to request that a copy of the inspection reports be submitted. At a minimum, the inspection report shall include the following:

Item 25. add "and signatures"

"and signatures" added

1. Inspection date
2. Name(s) and title(s) of personnel making the inspection
3. Location(s) of discharges of sediment or other pollutants from the site
4. Location(s) of BMPs that need to be maintained
5. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location
6. Location(s) where additional BMPs are needed or were not in place at the time of inspection
7. Deviations from the minimum inspection schedule
8. Description of corrective action for items c, d, e and f above, dates corrective action(s) taken, and measures taken to prevent future violations, including requisite changes to the SWMP, as necessary
9. After adequate corrective action(s) have been taken, or where a report does not identity any incidents requiring corrective action, the report shall contain a signed statement indicating the site is in compliance with the permit to the best of the signer's knowledge and belief

10. The date and amount of storm or snowmelt events that cause erosion.

BMP MAINTENANCE/REPLACEMENT AND FAILED BMPS

Adequate site assessment shall be performed as part of comprehensive Inspection and Maintenance procedures to assess the adequacy of BMPs at the site and to evaluate the necessity of changes to those BMPs to ensure continued effective performance. Where site assessment results in the determination that new or replacement BMPs are necessary, the BMPs shall be installed to ensure ongoing implementation. Failed BMPs must be addressed as soon as possible, in most cases immediately, to ensure continued performance and minimize the likelihood of pollutant discharge. The SWMP shall be updated once new BMPs are installed or failed BMPs replaced. A specific timeline for implementing maintenance procedures is not included in the State Permit because BMP maintenance is expected to be proactive, not responsive. Observations resulting in BMP maintenance activities can be made during a site inspection, or during general observations of site conditions. BMPs shall be maintained per DCM2 criteria and ECM criteria. Please refer to the Appendix for specific maintenance required for each BMP.

PLAN REVIEW AND REVISIONS

1. The plan must be signed in accordance with the general permit.
2. The plan must be made available, upon request, to CDPHE, United States Environmental Protection Agency, or operator of the local municipal storm sewer system, if applicable.
3. The plan must be amended whenever there is a change in design, construction, operation or maintenance that could have a significant effect on the potential for the discharge of pollutants to State Waters. It also must be amended if it is found to be ineffective in controlling pollutants present in stormwater.

RECORD KEEPING AND DOCUMENTING OF INSPECTIONS

The permittee shall retain a copy of the SWMP required by this permit (including a copy of the permit language) at the construction site (or other local location accessible to the Director; a State or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site) from the date of project initiation to the date of final

stabilization. Permittees with day-to-day operational control over SWMP implementation shall have a copy of the SWMP available at a central location on-site for the use of all operators and those identified as having responsibilities under the SWMP whenever they are on the construction site. If minor modifications to the SWMP are required, they shall be recorded on the owner's copy of the SWMP and be available during inspections. Whenever a significant change is made to the SWMP (including changes to design, construction, operation or maintenance), an amended SWMP shall be submitted for review and approval. The following documents must be kept in a field office, trailer, shed or vehicle that is onsite during normal working hours:

1. A completed and signed copy of the Notice of Intent
2. The permit coverage letter from the Colorado Department of Public Health and Environment (CDPHE)
3. The Stormwater Management Plan
4. Site Inspection Records
5. A copy of the Colorado General Permit for Stormwater Discharges from Construction Activities

If a reasonable onsite location is not available, then the documents may be retained at a readily available alternative location, preferably with the SWMP plan contact. If the site is inactive, then the documents may be stored at a local office.

All records and information must be kept for at least three years or longer if requested by the Colorado Department of Public Health and Environment or United States Environmental Protection Agency.

RECORD KEEPING

The SWMP is a "living document" that is continuously reviewed and modified. The ECS shall make changes to the SWMP, including but not limited to: additions, deletions, changing locations of BMP's shall be marked in the plans, dated and initialed at time of occurrence.

All inspection and maintenance activities or other repairs will be documented by the ECS and the records kept on the project site.

Records of spill, leaks or overflows that result in the discharge of pollutants will be documented and maintained. The following Information will be recorded for all occurrences:

1. Time and date
2. Weather conditions
3. Reasons for spill

4. A release of any chemical, oil, petroleum product, sewage, etc., which may enter state waters must be reported.

At 14-day inspections incidents of noncompliance, such as uncontrolled releases of pollutants including mud, muddy water or measurable quantities of sediment found off-site shall be noted, along with a brief explanation as to measures taken to prevent future violations and measures taken to clean up sediment that has left the site.

After measures have been taken to correct any problems and recorded, or where a report does not identify incidents of noncompliance, the report shall contain a signed certification indicating the site is in compliance.

Signature Page:

Engineer's Statement:
The Erosion and Stormwater Quality Control/Grading Plan was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the grading and erosion control plan, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of public way, drainage channel, or other property.

_____

Grant Dennis Date
Registered Professional Engineer
State of Colorado No. 51622

Developer's Statement:
The owner will comply with the requirements of the Erosion and Stormwater Quality Control Plan including temporary BMP inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for Stormwater discharges associated with Construction Activity.

Developer/ Owner Signature: _____

Name of Developer/ Owner: Challenger Communities LLC

DBA: _____ Phone: _____

Title: _____ Email: _____

Address: _____ Fax: _____

APPENDIX A

MERIDIAN ROAD IMPROVEMENTS

MERIDIAN RD & BENT GRASS MEADOWS DR
SCALE: 1" = 1,000'

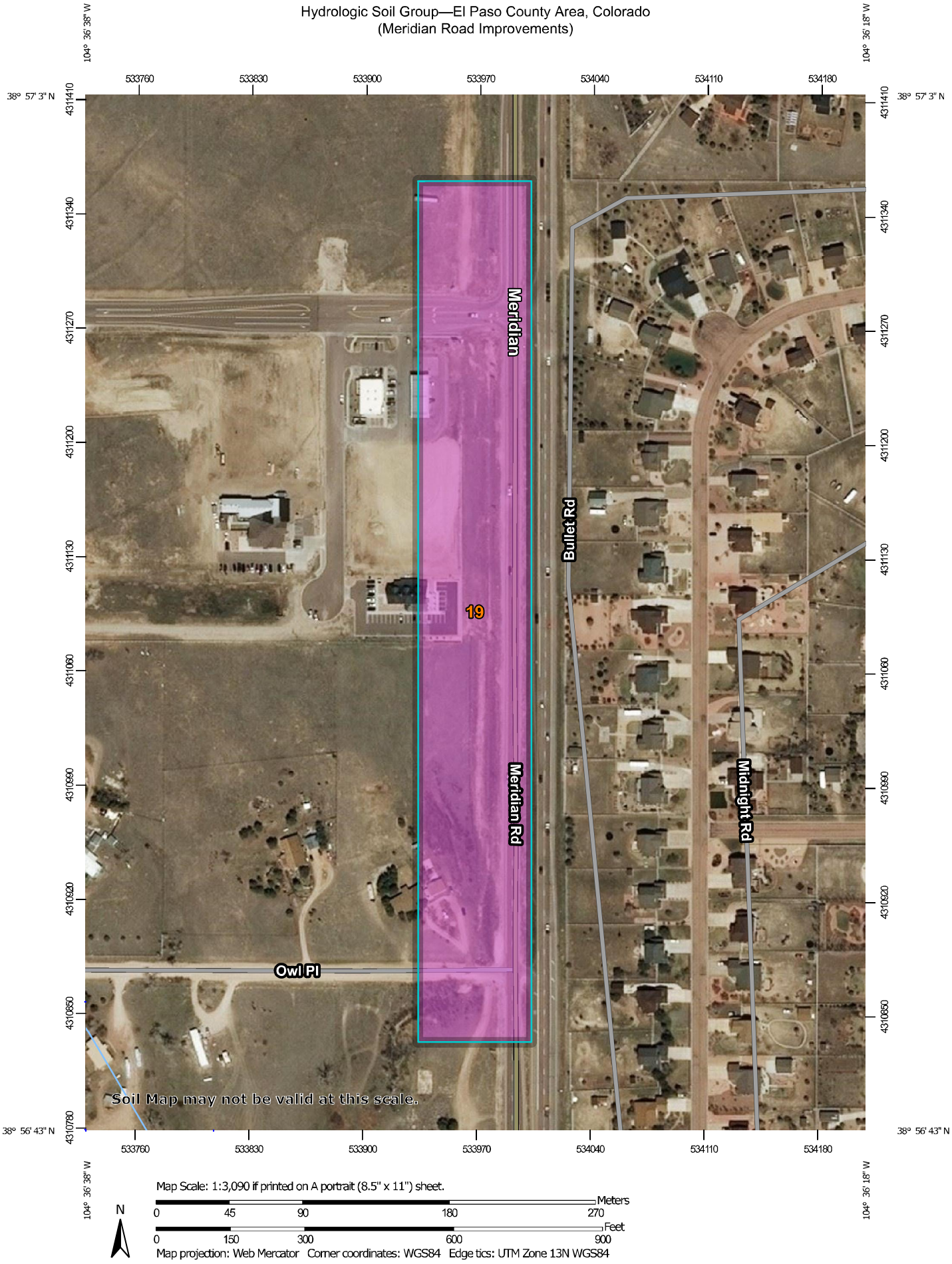
VICINITY MAP

Project No:	CLH000016.20
Drawn By:	BHB
Checked By:	SMB
Date:	NOVEMBER 2019

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220 • GallowayUS.com

APPENDIX B

Hydrologic Soil Group—El Paso County Area, Colorado
(Meridian Road Improvements)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 8, 2018—May 26, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	A	9.1	100.0%
Totals for Area of Interest			**9.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX C

Reviewed GEC V_2

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE

COUNTY OF EL PASO, STATE OF COLORADO

GRADING AND EROSION CONTROL PLANS

SPRING 2020

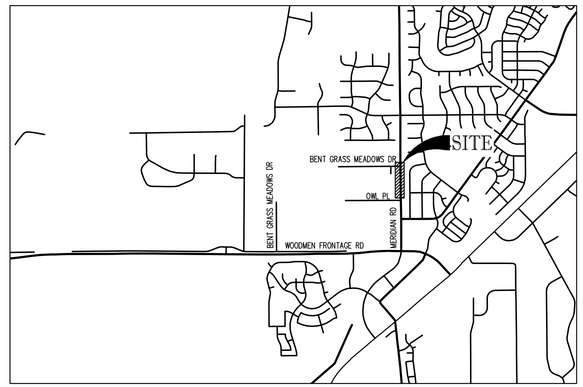
GENERAL CONSTRUCTION NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NONEXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPLACED AT THE CONTRACTORS EXPENSE AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
3. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
4. ALL BACKFILL, SUB-BASE AND / OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED TO THE SOILS ENGINEERS RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY PCD ENGINEERING DIVISION.
5. ALL STATIONING IS CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE FLOW LINE UNLESS OTHERWISE INDICATED.
6. ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO THE EPC ECM APPENDIX K – 1.2C.
7. ALL INTERSECTION ACCESSES TO BE CONSTRUCTED WITH A 25 FOOT SIGHT VISIBILITY TRIANGLES AND THERE SHALL BE NO OBSTRUCTIONS GREATER THAN 18" IN THIS AREA.
8. ALL CULVERT AND STORM PIPES SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE (HDPE), OR REINFORCED CONCRETE PIPE (RCP). ALL CULVERTS SHALL BE PLACED COMPLETE WITH FLARED END SECTIONS. ADEQUACY OF MATERIAL THICKNESS FOR ANY CSP INSTALLED SHALL BE VERIFIED BY OWNERS GEOTECHNICAL ENGINEER TO SUPPORT MINIMUM 50 YEAR DESIGN LIFE. CULVERTS MUST CONFORM TO EPC ECM SECTION 3.32 – CULVERTS.
9. ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED FOR ROADS SHALL BE PER DESIGN REPORT BY OWNERS GEOTECHNICAL ENGINEER. OWNERS GEOTECHNICAL ENGINEER TO BE ON SITE AT TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION PRIOR TO CONSTRUCTION.
10. TYPE M RIP-RAP WITH 4" OF TYPE I GRANULAR BEDDING AND MIRAFI 180N OR EQUAL MAY BE SUBSTITUTED WHERE TYPE L RIP-RAP WITH MIRAFI FW 700 OR EQUAL IS SPECIFIED.
11. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN COMPLIANCE WITH ANY AND ALL APPLICABLE EL PASO COUNTY STANDARDS AND WITH WOODMAN HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
12. ALL POTABLE WATER MAINS SHALL BE AWWA C900-50R18 PVC WITH PUSH-ON SINGLE GASKET TYPE JOINTS AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
13. ALL WATER MAIN FITTINGS SHALL BE MADE FROM GRAY-IRON OR DUCTILE IRON AND FURNISHED WITH MECHANICAL JOINT ENDS. ALL FITTINGS SHALL HAVE A PRESSURE RATING OF 250 PSI AND SHALL MEET THE REQUIREMENTS OF ANSI / NSF 61.
14. ALL WATER LINE BENDS, TEES, BLOW-OFFS AND PLUGS AT DEAD-END MAINS SHALL BE PROTECTED FROM THRUST BY USING CONCRETE THRUST BLOCKS AND / OR RODDING AND RESTRAINED PIPE PER THE PAINT BRUSH HILLS METRO DISTRICT CONSULTING ENGINEER APPROVAL.
15. MAXIMUM DEFLECTION OF 8" OR 12" PVC WATER MAIN JOINTS IS 4 DEGREES. CORRESPONDING MINIMUM CURVE RADIUS IS 286'. ADDITIONAL 11.25° OR 22.5° BENDS MAY BE REQUIRED FOR PROPER ALIGNMENT.
16. CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILED AS-BUILTS OF ALL WATER MAIN, STORM SEWER AND SANITARY. SEWER MAIN INSTALLATIONS, INCLUDING ACCURATE DISTANCES OF MAIN LINES, VALVES, FITTINGS, MANHOLES AND LOCATIONS OF WATER AND SEWER SERVICES.
17. SANITARY SEWER PIPE AND FITTINGS: PVC 4" – 8" ASTM D3034, TYPE PSM, SDR 35: PUSH-ON JOINTS AND MOLDED RUBBER GASKETS MAXIMUM HORIZONTAL DEFLECTIONS, AFTER INSTALLATION AND BACK FILLING SHALL NOT EXCEED 3% OF THE PIPE DIAMETER. (MINIMUM CURVE RADIUS IS 100' FOR 8" PVC SANITARY SEWER MAIN)

STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFFSITE WATERS, INCLUDING WETLANDS.
2. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A NOTICE TO PROCEED HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED GCC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF.
5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES IS NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN PRIOR TO IMPLEMENTATION.
7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE STABILIZED.
8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70 PERCENT OF PRE-DISTURBANCE LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.
9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE HYDROLOGY OR HYDRAULICS OF A PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME. PRE-EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A WATERS OF THE STATE, UNLESS INFEASIBLE.
11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
12. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF SITE.
13. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY.
14. DEWATERING OPERATIONS: UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON SITE, BUT MAY NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF.
15. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
16. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
17. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
19. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
20. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
21. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL HAVE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCH FLOW LINE.
24. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT"(TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT"(33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ROCKY MOUNTAIN GROUP AND SHALL BE CONSIDERED A PART OF THESE PLANS.
29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL DIVISION
WQCD -PERMITS
4300 CHERRY CREEK DRIVE SOUTH
DENVER, CO 80246-1530
ATTN: PERMITS UNIT



VICINITY MAP
NTS

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
   A. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
   B. CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
   C. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   D. CDOT M & S STANDARDS
4. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) – INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

EROSION CONTROL NOTES

1. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF THE CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY CONTROL DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STROMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD – PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246-1530
   ATTN: PERMITS UNIT
2. ALL DISTURBED AREAS TO BE RESEEDED UPON COMPLETION OF OVERLOT GRADING AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED OR WITHIN 60 DAYS, WHICHEVER IS LESS TIME.
3. CONSTRUCTION FENCE AND SILT FENCE OFFSET FOR CLARITY. CONTRACTOR TO ENSURE BMPS ARE PLACED DOWNSTREAM OF DISTURBED AREAS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
4. BENT GRASS ROAD SHALL BE STREET SWEPT AND INSPECTED ON A REGULAR BASIS DURING CONSTRUCTION.

ENGINEER'S STATEMENT

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY AN NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

RONALD G. DENNIS, COLORADO P.E. NO. 0051622 — DATE

OWNER'S STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

CHALLENGER COMMUNITIES, LLC — DATE

EL PASO COUNTY

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/ OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT. FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VAUD FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JENNIFER IRVINE, P.E. — DATE
COUNTY ENGINEER / ECM ADMINISTRATOR

CAUTION – NOTICE TO CONTRACTOR

1. ALL UTILITY LOCATIONS SHOWN ARE BASED ON MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANY AND FIELD SURFACE EVIDENCE AT THE TIME OF SURVEY AND IS TO BE CONSIDERED AN APPROXIMATE LOCATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE FIELD LOCATION OF ALL UTILITIES, PUBLIC OR PRIVATE, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
2. WHERE A PROPOSED UTILITY CROSSES AN EXISTING UTILITY, IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF SUCH EXISTING UTILITY, EITHER THROUGH POTHOLING OR ALTERNATIVE METHOD. REPORT INFORMATION TO THE ENGINEER PRIOR TO CONSTRUCTION.

811 Know what's **below.** **Call** before you dig.

LIST OF CONTACTS

APPLICANT/DEVELOPER
CHALLENGER COMMUNITIES, LLC
13570 NORTHGATE ESTATES DR.
COLORADO SPRINGS, CO 80921
TEL: (719) 598-5190
CONTACT: JIM BYERS
EMAIL: JIMBAR@CHALLENGERHOMES.COM

ENGINEER
GALLOWAY & COMPANY, INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, COLORADO 80920
TEL: (719) 900-7220
CONTACT: GRANT DENNIS, P.E.
EMAIL: GRANTDENNIS@GALLOWAYUS.COM

EL PASO COUNTY
EL PASO COUNTY, PLANNING & COMMUNITY DEVELOPMENT
2880 INTERNATIONAL CIRCLE, SUITE 110
COLORADO SPRINGS, COLORADO 80910
TEL: (719) 520-6300

SURVEYOR
GALLOWAY & COMPANY, INC.
1155 KELLY JOHNSON BLVD., SUITE 305
COLORADO SPRINGS, COLORADO 80920
TEL: (719) 900-7220
CONTACT: LYLE BISSEGGER
EMAIL: LYLEBISSEGGER@GALLOWAYUS.COM

UTILITY REVIEW – WATER/WASTEWATER
WOODMEN HILLS METRO DISTRICT
8046 EASTONVILLE ROAD
FALCON, COLORADO 80831
TEL: (719) 495-2500
CONTACT: JERRY JACOBSON
EMAIL: JERRY@WHMD.ORG

UTILITY REVIEW – GAS
CITY OF COLORADO SPRINGS
1521 HANCOCK EXPY #4801
COLORADO SPRINGS, COLORADO 80903
TEL: (719) 668-8267
CONTACT: RYNE SOLBERG
EMAIL: RSOLBERG@CSU.ORG

ELECTRIC
MOUNTAIN VIEW ELECTRIC
11140 E WOODMEN RD
FALCON, COLORADO 80831
TEL: (719) 495-2283

FIRE DISTRICT
FALCON FIRE PROTECTION DISTRICT
7030 OLD MERIDIAN ROAD
PEYTON, COLORADO 80831
TEL: (719) 495-4050
EMAIL: FALCONFIRE@FALCONFIREPD.ORG

Sheet List Table		
SHEET NUMBER	SHEET DESCRIPTION	SHEET TITLE
1	C0.0	COVER SHEET
2	C1.0	GRADING AND EROSION CONTROL PLAN
3	C2.0	DETAILS

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
GRADING & EROSION CONTROL PLANS
FOR
CHALLENGER COMMUNITIES, LLC

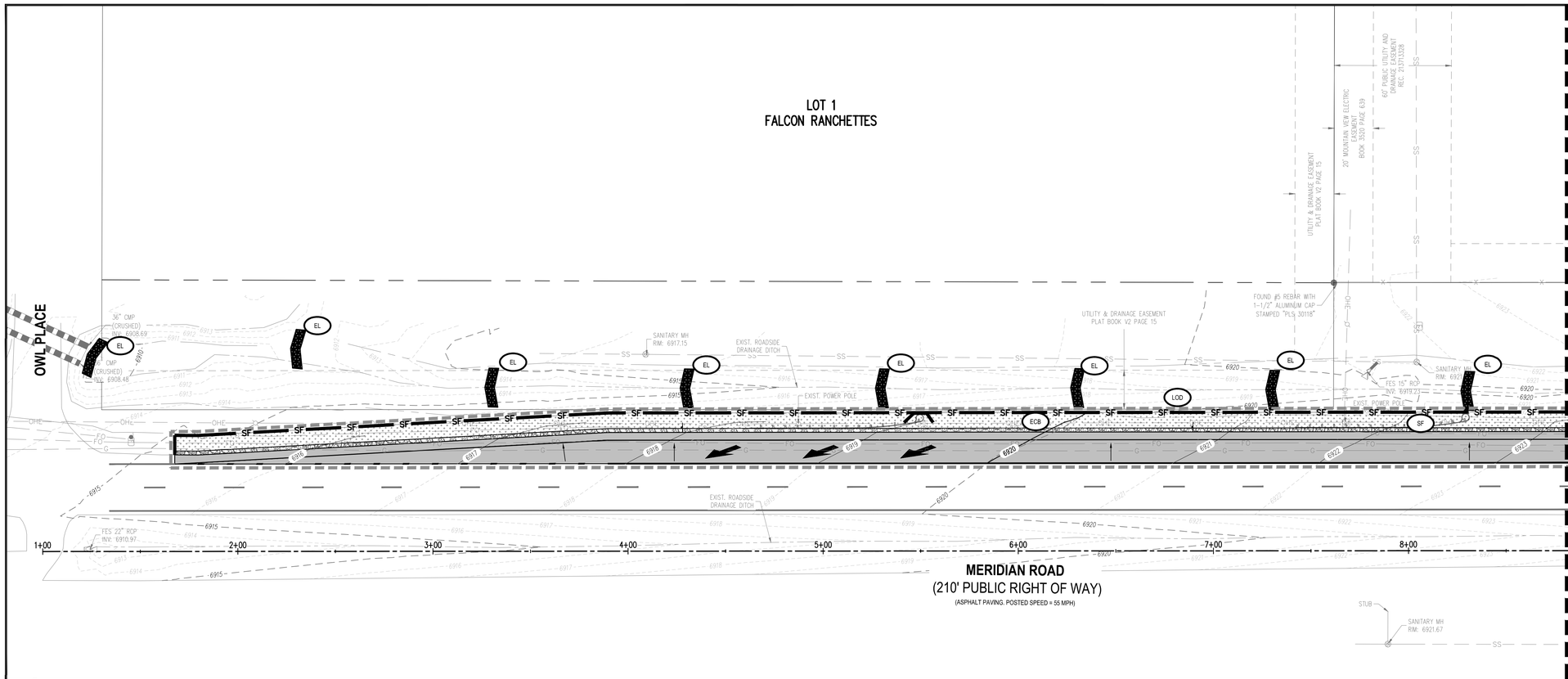
SWC BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 EL PASO COUNTY

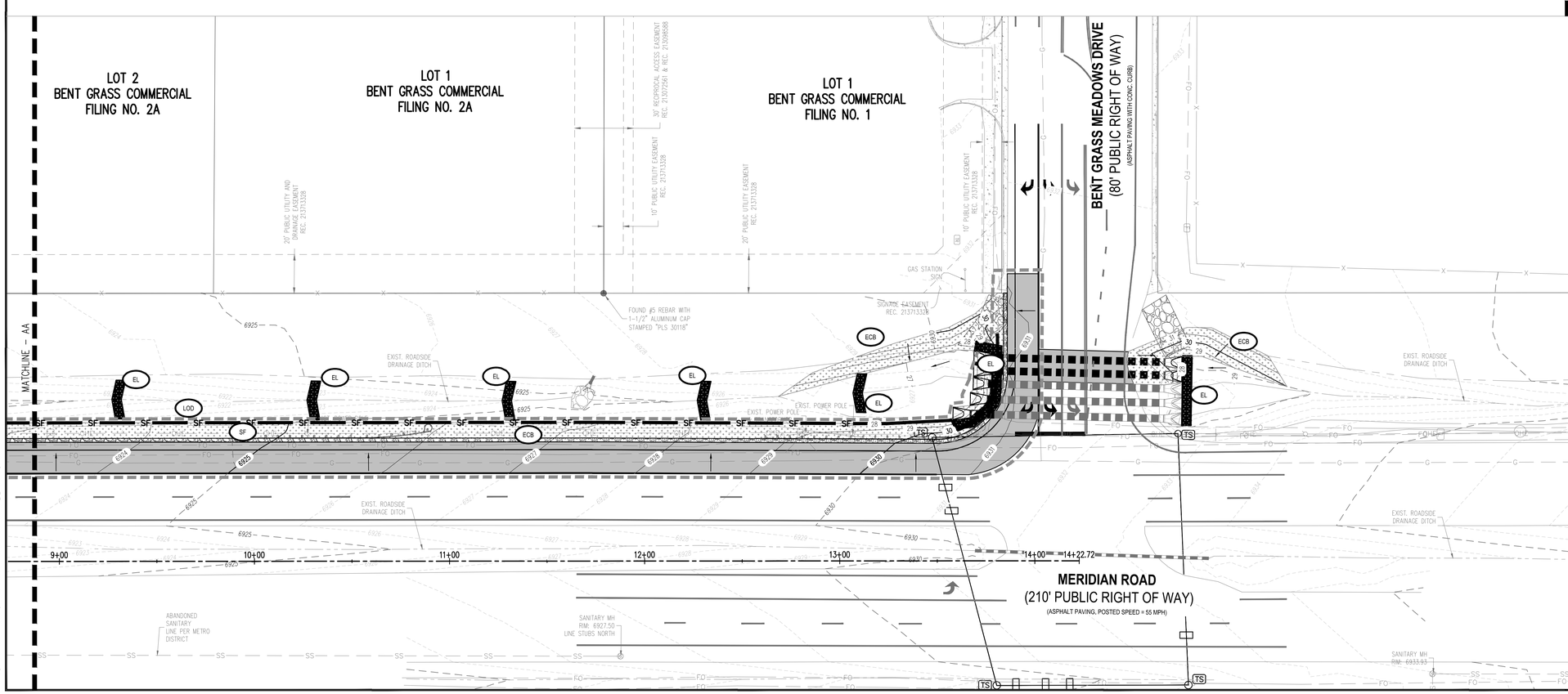
#	Date	Issue / Description	Init.
1	03/27/20	REV. PER COUNTY COMMENTS	TJE

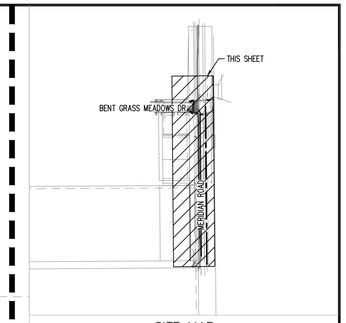
Project No:	CLH0015.20
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

COVER SHEET

C0.0
Sheet 1 of 3







SITE MAP
SCALE: 1" = 600'

N

0 15 30
SCALE: 1"=30'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING FIBER OPTIC LINE
- EXISTING SANITARY SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING FENCE LINE
- EXISTING STORM LINE
- PROPOSED STORM PIPE
- FOUND PROPERTY MONUMENT
- EXISTING SANITARY MANHOLE
- EXISTING WATER VALVE
- EXISTING SIGN
- EXISTING UTILITY MARKER POST
- EXISTING TELECOM PEDESTAL
- EXISTING ELECTRICAL TRANSFORMER
- FIBER OPTIC PULL BOX
- EXISTING FLARED END SECTION
- EXISTING UTILITY POLE
- 6921 EXISTING MINOR CONTOUR
- 6922 EXISTING MAJOR CONTOUR
- 6921 PROPOSED MINOR CONTOUR
- 6922 PROPOSED MAJOR CONTOUR
- 6922.50 PROPOSED SPOT ELEVATION
- 0.45% PROPOSED SLOPE
- PROPOSED 8" THICK STRIPING
- PROPOSED 4" THICK STRIPING
- PROPOSED ASPHALT
- PROPOSED SIGN
- SF SILT FENCE
- LOD LIMITS OF DISTURBANCE
- ECB EROSION CONTROL BLANKET
- EL EROSION LOG CHECK DAM
- PROPOSED FLOW

CONTRACTORS NOTE:

ALL EXISTING UNDERGROUND UTILITIES LOCATIONS APPROXIMATELY SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES CAUSED BY ANY CONSTRUCTION ACTIVITIES CAUSED IF THE UTILITY LOCATE HAS NOT BEEN PERFORMED.

VEGETATION NOTE:

NO NOTABLE VEGETATION IS OBSERVED WITHIN THE LIMITS OF CONSTRUCTION ON THIS SITE. THE EXISTING VEGETATION WITHIN THE LIMITS OF DISTURBANCE CONSISTS OF NATIVE GRASSES AND WEEDS.

CAUTION – NOTICE TO CONTRACTOR

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MERIDIAN ROAD & BENT GRASS MEADOWS DRIVE
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FOR
CHALLENGER COMMUNITIES, LLC

SWC BENT GRASS MEADOWS DRIVE & MERIDIAN ROAD
FALCON, CO 80831 EL PASO COUNTY

#	Date	Issue / Description	Init.
1	03/27/20	REV. PER COUNTY COMMENTS	TJE

Project No:	IAA000001
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

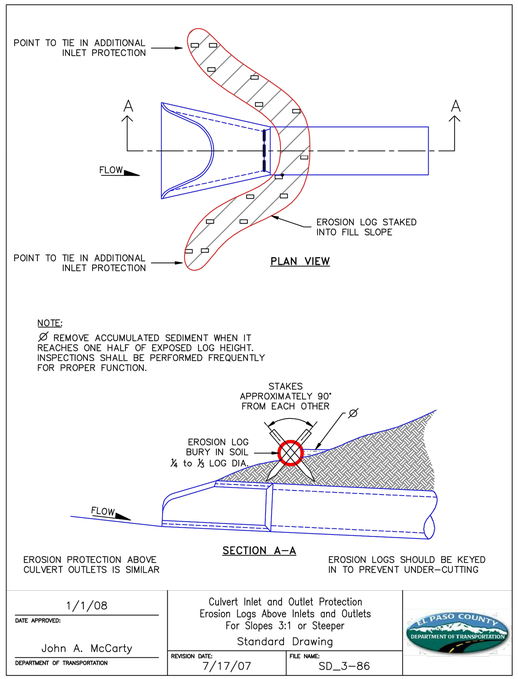
GRADING AND EROSION CONTROL PLAN

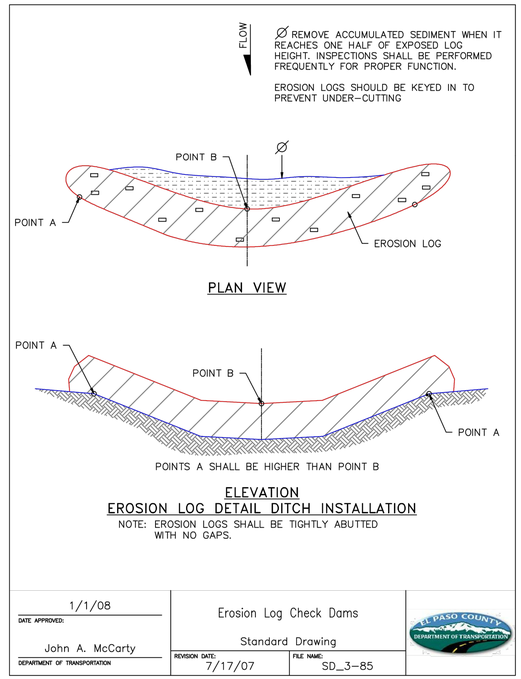
C1.0

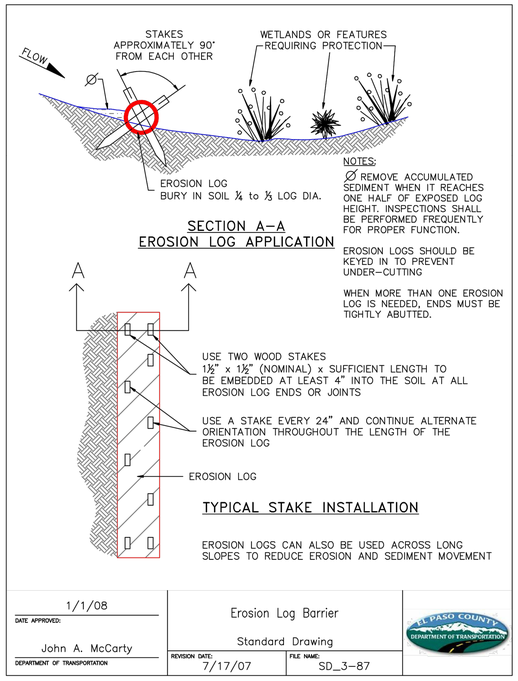
EROSION CONTROL CRITERIA

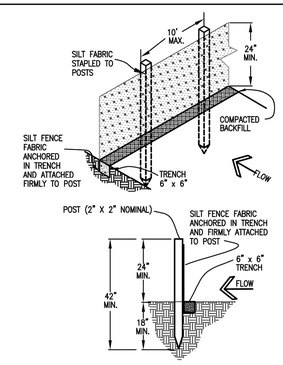
EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IN A MANNER THAT WILL PROTECT PROPERTIES AND PUBLIC FACILITIES FROM THE ADVERSE EFFECTS OF EROSION AND SEDIMENTATION AS A RESULT OF CONSTRUCTION AND EARTHWORK ACTIVITIES WITHIN THE PROJECT SITE.

1. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NON-EXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. DURING GRADING OPERATIONS, LOCATE AND SET THE STRAW BALE CHECK DAMS AND SILT FENCES AS SHOWN ON THE EROSION CONTROL PLAN. AT THIS TIME RESEED ALL DISTURBED AREAS WITH AN EL PASO COUNTY APPROVED SEED MIX.
3. SEEDING APPLICATION: DRILLED TO A DEPTH OF 0.25" TO 0.50" INTO SOIL WHERE POSSIBLE. BROADCAST AND RANKED TO COVER ON STEEPER THAN 3:1 SLOPES WHERE ACCESS IS LIMITED OR UNSAFE FOR EQUIPMENT.
4. MULCHING REQUIREMENTS AND APPLICATION: 1.5 TONS PER ACRE NATIVE HAY MECHANICALLY CRIMPED INTO SOIL.
5. THE STRAW BALE CHECK DAMS AND SILT FENCES SHALL BE KEPT IN PLACE AND MAINTAINED UNTIL EROSION AND SEDIMENTATION POTENTIAL IS MITIGATED. REMOVAL OF SILT AND SEDIMENT COLLECTED BY THE STRAW BALES IS REQUIRED ONCE IT REACHED HALF THE HEIGHT OF THE STRAW BALES OR SILT FENCE.
6. DISTURBED SOIL SHALL BE VEGETATED WITHIN 60 DAYS AFTER SUBSTANTIAL FINAL GRADING IS COMPLETE. PROVIDE TEMPORARY VEGETATION TO DISTURBED AREAS THAT WILL HAVE A PERIOD OF EXPOSURE OF 6 MONTHS OR LONGER PRIOR TO FINAL STABILIZATION.
7. ALL FACILITIES, VEGETATION AND OTHER ITEMS REQUIRED BY THE APPROVED FINAL GRADING, EROSION CONTROL AND RECLAMATION PLAN SHALL BE PROPERLY MAINTAINED BY THE OWNERS OF THE PROPERTY. SUCH MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO KEEPING ALL EROSION CONTROL FACILITIES IN GOOD ORDER AND FUNCTIONAL, REPAIRING ANY EROSION DAMAGE THAT OCCURS, KEEPING ALL VEGETATION HEALTHY AND IN GROWING CONDITION AND REPLACING ANY DEAD VEGETATION AS SOON AS PRACTICABLE.
8. ALL SILT FENCES ARE TO BE REGULARLY INSPECTED AND REPAIRED AS NEEDED.
9. THE CONTRACTOR SHALL PROVIDE VEHICLE TRACING CONTROL FACILITIES FOR EACH ENTRANCE / EXIT TO THE SITE. THE CONTRACTOR SHALL SUBMIT A PLAN WHICH WILL ASSURE USAGE OF THE FACILITY BY ALL VEHICLES LEAVING THE SITE.
10. EROSION CONTROL MEASURES SHALL BE CHECKED AFTER EACH STORM EVENT AND REPAIRED WHEN NECESSARY.
11. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION CONTROL FACILITIES IN GOOD WORKING ORDER UNTIL SUCH TIME AS PERMANENT FACILITIES ARE IN PLACE AND THE CONSTRUCTION MANAGER HAS APPROVED THEIR REMOVAL.
12. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
13. THE EROSION CONTROL MEASURES OUTLINED ON THE PLAN ARE THE RESPONSIBILITY OF THE DEVELOPER TO MONITOR AND REPLACE, REGRADE AND REBUILD AS NECESSARY UNTIL VEGETATION IS ESTABLISHED.









SILT FENCE

SILT FENCE NOTES

INSTALLATION REQUIREMENTS

1. SILT FENCES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

2. WHEN JOINTS ARE NECESSARY, SILT FENCE GEOTEXTILE SHALL BE SPLICED TOGETHER ONLY AT SUPPORT POST AND SECURELY SEALED.

3. METAL POSTS SHALL BE "STUDDED TEE" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD POSTS SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION DIMENSION OF 2 INCHES.

4. THE FILTER MATERIAL SHALL BE FASTENED SECURELY TO METAL OR WOOD POSTS USING WIRE TIES, OR TO WOOD POSTS WITH 3/4" LONG #9 HEAVY-DUTY STAPLES. THE SILT FENCE GEOTEXTILE SHALL NOT BE STAPLED TO EXISTING TREES.

5. WHILE NOT REQUIRED, WIRE MESH FENCE MAY BE USED TO SUPPORT THE GEOTEXTILE. WIRE FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 3/4" LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 6" AND SHALL NOT EXTEND MORE THAN 3' ABOVE THE ORIGINAL GROUND SURFACE.

6. ALONG THE TOE OF FILLS, INSTALL THE SILT FENCE ALONG A LEVEL CONTOUR AND PROVIDE AN AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE. A MINIMUM DISTANCE OF 5 FEET FROM THE TOE OF THE FILL IS RECOMMENDED.

7. THE HEIGHT OF THE SILT FENCE FROM THE GROUND SURFACE SHALL BE MINIMUM OF 24 INCHES AND SHALL NOT EXCEED 36 INCHES; HIGHER FENCES MAY INPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SILT FENCES IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE SILT FENCES SHALL BE PROMPTLY REPAIRED OR REPLACED.

2. SEDIMENT SHALL BE REMOVED FROM BEHIND SILT FENCE WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.

3. SILT FENCES SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED AS APPROVED BY THE CITY.

City of Colorado Springs Stormwater Quality	Figure SF-2 Silt Fence Construction Detail and Maintenance Requirements

3-36

Galloway
1155 Kelly Johnson Blvd., Suite 305
Colorado Springs, CO 80920
719.900.7220
GallowayUS.com

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#	Date	Issue / Description	Init.
1	03/27/20	REV. PER COUNTY COMMENTS	TJE

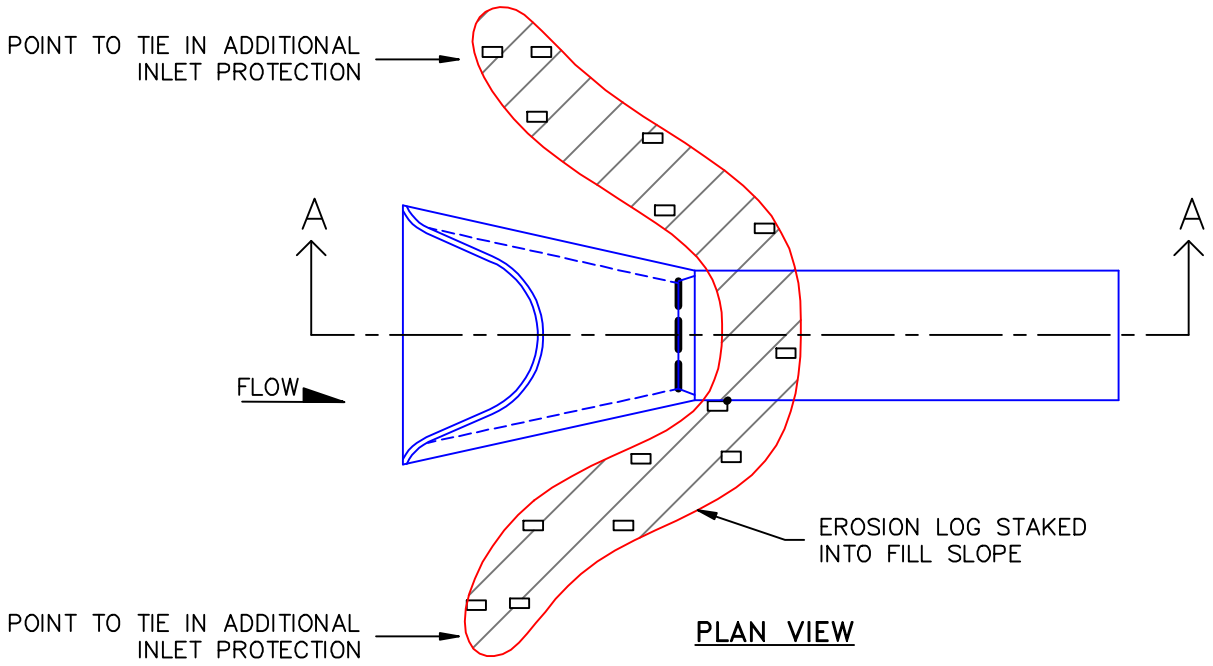
Project No:	IAA000001
Drawn By:	JDP
Checked By:	RGD
Date:	11/15/2019

DETAILS

C2.0

Sheet 3 of 3

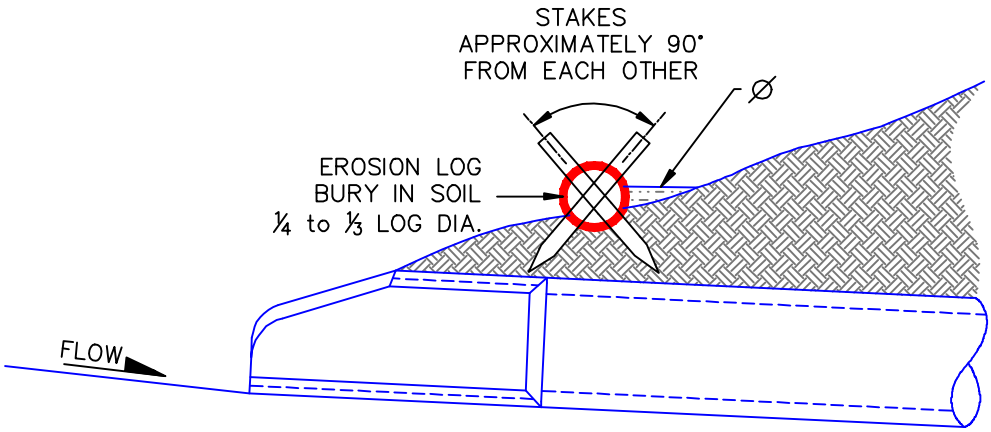
APPENDIX D



PLAN VIEW

NOTE:

Ø REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE HALF OF EXPOSED LOG HEIGHT. INSPECTIONS SHALL BE PERFORMED FREQUENTLY FOR PROPER FUNCTION.

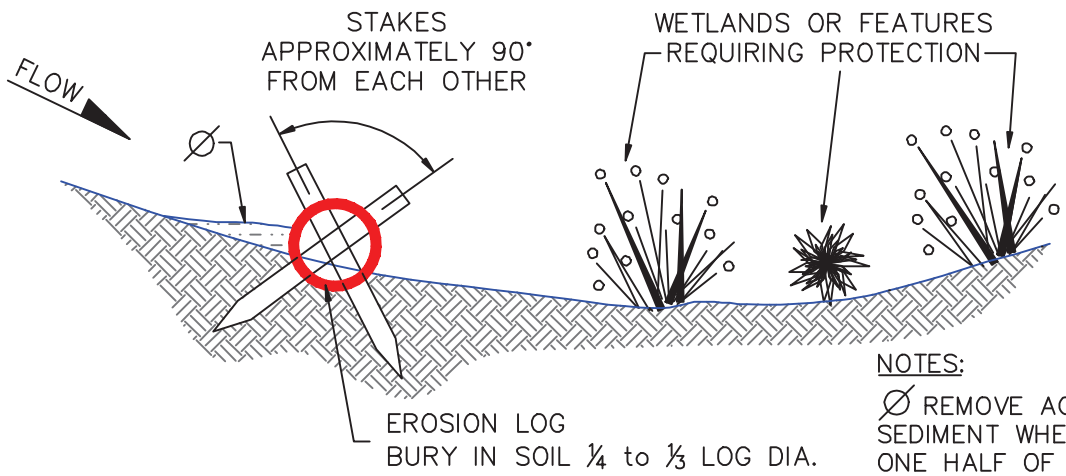


SECTION A–A

EROSION PROTECTION ABOVE CULVERT OUTLETS IS SIMILAR

EROSION LOGS SHOULD BE KEYED IN TO PREVENT UNDER–CUTTING

1/1/08 DATE APPROVED: John A. McCarty DEPARTMENT OF TRANSPORTATION	Culvert Inlet and Outlet Protection Erosion Logs Above Inlets and Outlets For Slopes 3:1 or Steeper Standard Drawing REVISION DATE: 7/17/07 FILE NAME: SD_3–86	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION



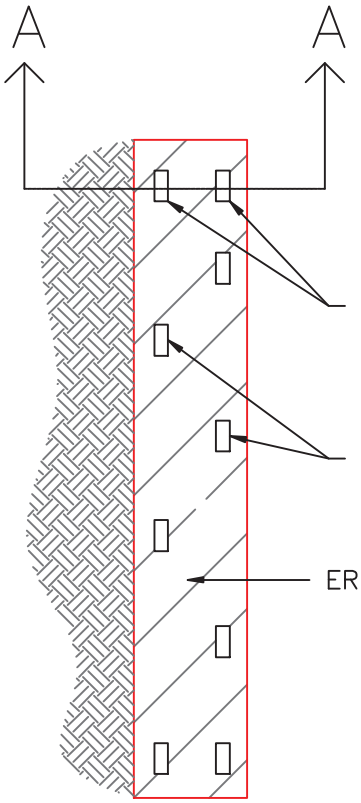
SECTION A–A
EROSION LOG APPLICATION

NOTES:

Ø REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE HALF OF EXPOSED LOG HEIGHT. INSPECTIONS SHALL BE PERFORMED FREQUENTLY FOR PROPER FUNCTION.

EROSION LOGS SHOULD BE KEYED IN TO PREVENT UNDER–CUTTING

WHEN MORE THAN ONE EROSION LOG IS NEEDED, ENDS MUST BE TIGHTLY ABUTTED.



USE TWO WOOD STAKES
1½" x 1½" (NOMINAL) x SUFFICIENT LENGTH TO BE EMBEDDED AT LEAST 4" INTO THE SOIL AT ALL EROSION LOG ENDS OR JOINTS

USE A STAKE EVERY 24" AND CONTINUE ALTERNATE ORIENTATION THROUGHOUT THE LENGTH OF THE EROSION LOG

EROSION LOG

TYPICAL STAKE INSTALLATION

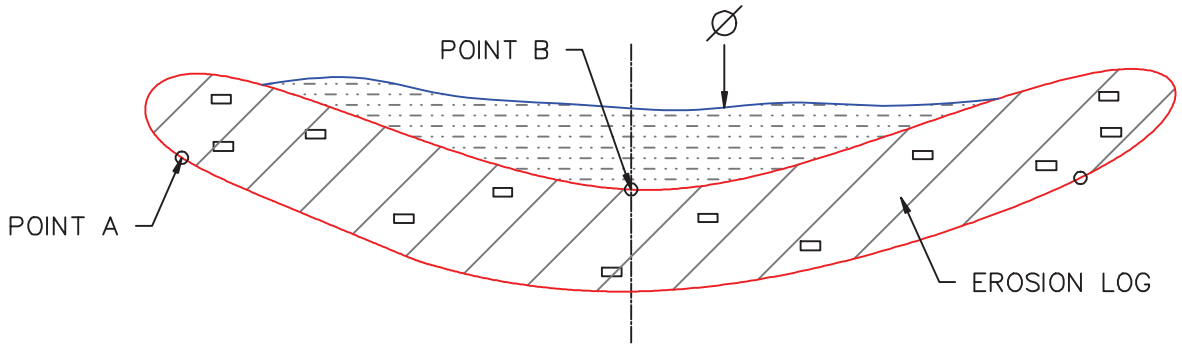
EROSION LOGS CAN ALSO BE USED ACROSS LONG SLOPES TO REDUCE EROSION AND SEDIMENT MOVEMENT

1/1/08 DATE APPROVED: John A. McCarty DEPARTMENT OF TRANSPORTATION	Erosion Log Barrier Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 7/17/07	FILE NAME: SD_3–87

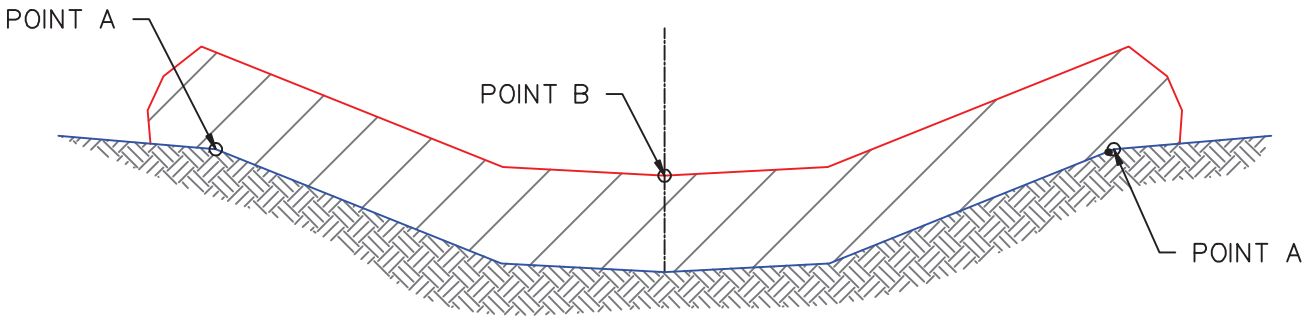
FLOW

∅ REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE HALF OF EXPOSED LOG HEIGHT. INSPECTIONS SHALL BE PERFORMED FREQUENTLY FOR PROPER FUNCTION.

EROSION LOGS SHOULD BE KEYED IN TO PREVENT UNDER–CUTTING



PLAN VIEW

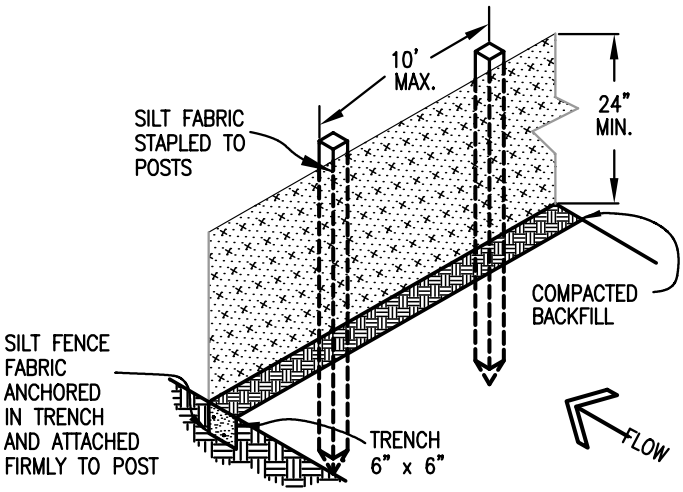


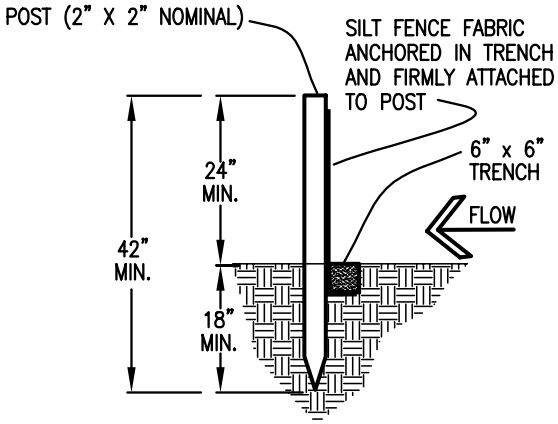
POINTS A SHALL BE HIGHER THAN POINT B

ELEVATION
EROSION LOG DETAIL DITCH INSTALLATION

NOTE: EROSION LOGS SHALL BE TIGHTLY ABUTTED WITH NO GAPS.

1/1/08 DATE APPROVED: John A. McCarty DEPARTMENT OF TRANSPORTATION	Erosion Log Check Dams Standard Drawing	EL PASO COUNTY DEPARTMENT OF TRANSPORTATION
	REVISION DATE: 7/17/07	FILE NAME: SD_3–85





SILT FENCE

SILT FENCE NOTES

INSTALLATION REQUIREMENTS

1. SILT FENCES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

2. WHEN JOINTS ARE NECESSARY, SILT FENCE GEOTEXTILE SHALL BE SPLICED TOGETHER ONLY AT SUPPORT POST AND SECURELY SEALED.

3. METAL POSTS SHALL BE "STUDDED TEE" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD POSTS SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION DIMENSION OF 2 INCHES.

4. THE FILTER MATERIAL SHALL BE FASTENED SECURELY TO METAL OR WOOD POSTS USING WIRE TIES, OR TO WOOD POSTS WITH 3/4" LONG #9 HEAVY-DUTY STAPLES. THE SILT FENCE GEOTEXTILE SHALL NOT BE STAPLED TO EXISTING TREES.

5. WHILE NOT REQUIRED, WIRE MESH FENCE MAY BE USED TO SUPPORT THE GEOTEXTILE. WIRE FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 3/4" LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 6" AND SHALL NOT EXTEND MORE THAN 3' ABOVE THE ORIGINAL GROUND SURFACE.

6. ALONG THE TOE OF FILLS, INSTALL THE SILT FENCE ALONG A LEVEL CONTOUR AND PROVIDE AN AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE. A MINIMUM DISTANCE OF 5 FEET FROM THE TOE OF THE FILL IS RECOMMENDED.

7. THE HEIGHT OF THE SILT FENCE FROM THE GROUND SURFACE SHALL BE MINIMUM OF 24 INCHES AND SHALL NOT EXCEED 36 INCHES; HIGHER FENCES MAY INPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SILT FENCES IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE SILT FENCES SHALL BE PROMPTLY REPAIRED OR REPLACED.

2. SEDIMENT SHALL BE REMOVED FROM BEHIND SILT FENCE WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.

3. SILT FENCES SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED AS APPROVED BY THE CITY.

City of Colorado Springs Stormwater Quality	Figure SF-2 Silt Fence Construction Detail and Maintenance Requirements

COMMENT RESPONSES – SWMP CHECKLIST

All Items in the SWMP Checklist must be addressed. If not applicable, explain in SWMP text and check box on SWMP Checklist. Do not use "N/A" on SWMP Checklist.

N/A Removed from responses

✔ Satisfies criteria

X Needs to be addressed

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EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT

GALLOWAY RESPONSE

the text in the SWMP states that these items are not applicable. This addresses these items

STORMWATER MANAGEMENT PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
1. STORMWATER MANAGEMENT PLAN (SWMP)			
1	Applicant (owner/designated operator), SWMP Preparer, Qualified Stormwater Manager, and Contractor Information. (On cover/title sheet)	Y	✔
2	Table of Contents	Y	✔
3	Site description and location to include: vicinity map with nearest street/crossroads description.	Y	✔
4	Narrative description of construction activities proposed (e.g., may include clearing and grubbing, temporary stabilization, road grading, utility / storm installation, final grading, final stabilization, and removal of temporary control measures)	Y	✔
5	Phasing plan – may require separate drawings indicating initial, interim, and final site phases for larger projects. Provide "living maps" that can be revised in the field as conditions dictate.	N/A	✔
6	Proposed sequence for major activities: Provide a construction schedule of anticipated starting and completion dates for each stage of land-disturbing activity depicting conservation measures anticipated, including the expected date on which the final stabilization will be completed. Dates updated in report	Y	X
7	Estimates of the total site area and area to undergo disturbance; current area of disturbance must be updated on the SWMP as changes occur.	Y	✔
8	Soil erosion potential and impacts on discharge that includes a summary of the data used to determine soil erosion potential	Y	✔
9	A description of existing vegetation at the site and percent ground cover and method used to determine ground cover	Y	✔
10	Location and description of all potential pollution sources including but not limited to: disturbed and stored soils; vehicle tracking; management of contaminated soils; loading and unloading operations; outdoor storage of materials; vehicle and equipment maintenance and fueling; significant dust generating process; routine maintenance activities involving fertilizers, pesticides, herbicides, detergents, fuels, solvents, oils, etc.; on-site waste management; concrete truck/equipment washing; dedicated asphalt, concrete batch plants and masonry mixing stations; non-industrial waste such as trash and portable toilets	Y	✔
11	Material handling to include spill prevention and response plan and procedures.	Y	✔
12	Spill prevention and pollution controls for dedicated batch plants	N/A	✔
13	Other SW pollutant control measures to include waste disposal and off site soil tracking	Y	✔
14	Location and description of any anticipated allowable non-stormwater discharge (ground water, springs, irrigation, discharge covered by CDPHE Low Risk Guidance, etc.)	N/A	✔
15	Name(s) of ultimate receiving waters; size, type and location of stormwater outfall or storm sewer system discharge	Y	✔
16	Description of all stream crossings located within the project area or statement that no streams cross the project area	Y	✔

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STORMWATER MANAGEMENT PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
17	SWMP Map to include: Reviewed GEC V_2		
17a	construction site boundaries limits of disturbance & construction boundary same, legend/callout updated to reflect this	Y	X
17b	flow arrows to depict stormwater flow di	Y	✓
17c	all areas of disturbance	Y	✓
17d	areas of cut and fill	Y	✓
17e	areas used for storage of building materials, soils (stockpiles) or wastes	Y	✓
17f	location of any dedicated asphalt / concrete batch plants Add a note to GEC Plans Note added on plan		X
17g	location of all structural control measures Missing EC items added to plan (VTC, CWA, ECB, Seeding)	Y	X
17h	location of all non-structural control measures	Y	X
17i	springs, streams, wetlands and other surface waters, including areas that require maintenance of pre-existing vegetation within 50 feet of a receiving water	Y	✓
18	Narrative description of all structural control measures to be used. Modifications to EPC standard control measures must meet or exceed County-approved details.	Y	✓
19	Description of all non-structural control measures to be used including seeding, mulching, protection of existing vegetation, site watering, sod placement, etc.	Y	✓
20	Technical drawing details for all control measure installation and maintenance; custom or other jurisdiction's details used must meet or exceed EPC standards Missing Details added to GEC Plan set	Y	X
21	Procedure describing how the SWMP is to be revised	Y	✓
22	Description of Final Stabilization and Long-term Stormwater Quality (describe nonstructural and structural measures to control SW pollutants after construction operations have been completed, including detention, water quality control measure etc.)	Y	✓
23	Specification that final vegetative cover density is to be 70% of pre-disturbed levels	Y	✓
24	Outline of permit holder inspection procedures to install, maintain, and effectively operate control measures to manage erosion and sediment	Y	✓
25	Record keeping procedures identified to include signature on inspection logs and location of SWMP records on-site "and signatures" added to statement	Y	X
26	If this project relies on control measures owned or operated by another entity, a documented agreement must be included in the SWMP that identifies location, installation and design specifications, and maintenance requirements and responsibility of the control measure(s). Note added in SWMP report & response changed to "Y"	N/A	X
	Please note: all items above must be addressed. If not ... ntifying "not applicable" will not satisfy CDPHE requirement of explanation.		
2. ADDITIONAL REPORTS/PERMITS/DOCUMENTS			
a	Grading and Erosion Control Plan (signed)		
b	Erosion and Stormwater Quality Control Permit (ESQCP) (signed)		
3. Applicant Comments:			
a			

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STORMWATER MANAGEMENT PLAN CHECKLIST

Revised: July 2019

		Applicant	PCD
b			
c			
4. Checklist Review Certifications:			
a	Engineer of Record: The Stormwater Management Plan was prepared under my direction and supervision and is correct to the best of my knowledge and belief. Said Plan has been prepared according to the criteria established by the County and State for Stormwater Management Plans. _____ _____ Engineer of Record Signature Date		
b	Review Engineer: The Stormwater Management Plan was reviewed and found to meet the checklist requirements except where otherwise noted or allowed by an approved deviation request. _____ _____ Review Engineer Date		