



**COLORADO**  
**Department of Transportation**

Region 2  
Traffic & Safety - Permits 5615  
Will Blvd.  
Pueblo, CO 81008

June 4, 2020

SH21A  
El Paso County

Nina Ruiz  
El Paso County Development Services Division  
2880 International Circle, Suite 110  
Colorado Springs, CO 80910-3127

RE: Trails at Aspen Ridge Filing #2 (Springs East at Waterview) - EA-SF1927

Dear Nina,

I am in receipt of a referral request for comment of the subject planned development. I understand that the Trails at Aspen Ridge Filing No. 2 is part of a previously submitted development formerly known as Springs East at Waterview and is located to the east of the development of Waterview East Preliminary Plan, but still within the existing boundary of that development now known as Trails at Aspen Ridge.

Filing No. 2 is a mixed use development on 175-acres with 98 single-family residential lots on with 24.03-acres of open spaces. This filing No. 2 is located within the existing filing of Trails at Aspen Ridge Filing No.1 which is east of the Powers Blvd between Bradley Rd and Fontaine Blvd. on the southeast portion of the Waterview East Preliminary Plan area in El Paso County. Comments are as follows;

**Traffic Operations comments:**

- a. Review of the updated Traffic Impact Analysis dated February 24, 2020 for filing no. 2 has been reviewed and the reviewers have no comments.
- b. **Previous comments from dated 03/31/20, 10/01/19 and 03/12/19 are still valid and were not addressed by the developer in this Traffic Impact Analysis or Drainage Report for Filing No.2. However, the previous comments still require updating and need to be addressed as a whole (please see the following).**
- c. Table 4 states that the southbound left turn lane on Powers Blvd can be restriped as dual left turn lanes, however there is no road surface for such restripe; a 150-ft long raised median exists at that location. How is this to be corrected, this will be required as part of terms and conditions of the Access Permit. Please provide update in recommended improvements.
- d. The existing mast arm will need to be lengthened for the second left turn.
- e. Bradley Road has been restriped for dual westbound to southbound left turn lanes when the signal was installed; This will be required as part of the Access Permit, please update table 4.
- f. Table 4 does not include the necessary lengthening of northbound right turn deceleration lane from Power Blvd to Bradley Rd. This will be required as part of the Access Permit, please update in recommended improvements.
- g. The 2040 Synchro reports for Powers Blvd. Interchange Northbound Ramp at Bradley Rd is missing the existing left turn traffic in both time periods from Figure 13. Please update Figure 13.



June 04, 2020  
SH21A

**Trails at Aspen Ridge Filing #2** (Springs East at Waterview) – EA-SF1927  
Paso County

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- h. The 2040 assumption of a six-lane Powers Blvd at Bradley overlooks the cost comparison of an interchange versus widening three miles of highway particularly with ADTs only at 40,000. The study should include an interchange alternative of 2040 traffic. Please update.
- i. Figure 19 depicts the long-term Bradley Road lane configuration east of Powers Blvd. It is clear from the drawing that the future eastbound left turn lanes for the future north side access will conflict with the future northbound ramp intersection. Please update.

**Hydraulics comments:**

- a. Review of the Master Drainage Study dated June 2019.
- b. Please provide calculations that show the capacity of the culvert crossing Powers, and how the Pond outfall and basin that don't drain to the pond affect the capacity of this culvert.  
Capacity of 60" culvert calculated to be 291 cfs. Anticipated Q100 (Equal to or less than pre development value) is 54.26 cfs.
- c. It looks like the southern portion of the Big Johnson Basin is draining south to the existing 48" culvert in the existing condition. Please verify that changing the drainage patterns by capturing and conveying runoff from this area to the detention pond and then to the 60" culvert doesn't cause issues downstream.  
See below.
- d. Also, the 60" culvert needs to be checked that minor storm event flows will produce velocities high enough to provide self cleaning velocity, per CDOT requirements.  
Anticipated velocity of 6.4 ft/s for Minor Storm which complies with CDOT requirements.
- e. Conversely, please check that the existing 48" culvert, south of the project will have sufficient cleansing velocity flows in the minor storm even after reducing flows at this culvert.  
Anticipated velocity for Minor Storm is 5.67 ft/s which complies with CDOT requirements.
- f. Previous comments on the Powers culvert capacities and minor flow cleansing velocity have not been addressed underlined above. Please provide calculations showing that the CDOT drainage infrastructure is not affected by this development. Include hydrology showing existing vs. proposed overall basin area tributary to culverts crossing under Powers as well as hydraulic analysis of each culvert.

**MDG Comment Responses:**

The above items were addressed in the Trails at Aspen Ridge Filing No. 1 FDR. Please see excerpts from the report below:

**D. CDOT Culverts across Powers Boulevard**

The west side of the project drains to the Powers Boulevard Ditch. The flows cross Powers Boulevard at a 60-inch culvert adjacent to the West Pond and at a 48-inch culvert near the southwest corner of the site. Flows within these two culverts remain in compliance with CDOT requirements. See Table 8.5 Below:

| Table 8.5<br>Powers Boulevard<br>Crossroad Culvert Calculations |                       |                   |  |                            |                            |
|---|-----------------------|-------------------|--|----------------------------|----------------------------|
| Sub-Basin   | Drainage Area (Acres) | Minor Storm (cfs) | Velocity (ft/s)<br><i>Req. min. 3 ft/s</i> | Major Storm Proposed (cfs) | Major Storm Existing (cfs) |
| OS-2  | 11.44                 | 1.73              |  | 11.65                      |                            |
| West Pond Full Buildout Discharge                               | 34.34                 | 0.70              |  | 26.20                      |                            |
| Powers Boulevard Right of Way                                   | 4.96                  | 7.01              |  | 16.40                      |                            |
| <b>60-Inch Culvert</b>  | <b>50.74</b>          | <b>9.45</b>       | <b>6.40</b>                                | <b>54.26</b>               | <b>59.6</b>                |
| Q1  | 1.09                  | 1.13              |  | 3.79                       |                            |
| Powers R/W and Adjacent Property                                | 4.53                  | 4.69              |  | 13.76                      |                            |
| <b>48-Inch Culvert</b>  | <b>5.62</b>           | <b>5.82</b>       | <b>5.67</b>                                | <b>17.55</b>               | <b>24.9</b>                |

Access comments:

- a. A State Highway Access Permit will be required for the connection of Bradley Road east to SH21A between El Paso County and CDOT. El Paso County will be the Permittee and the Development will be the Applicant. This need is to evaluate the traffic impacts and record any further roadway improvements or escrow needed at this location.
- b. State Highway Access Code, Vol 2, March 2002, Sec 2.13, Interchange Management Plan states; *any access in proximity to the interchange or potential interchange Access Rights should be obtained for a distance of 550-feet along the lesser street or crossroad meaasured from the radius point of the ramp touchdown curve.* It appears that the PUD Site Plan took this measurment from the centerline of existing SH21 to allow for the Legacy Hill Drive to obtain access from Bradley Rd. This does not comply with the State Highway Access Code and Will need to be revised.
- c. There will not be any allowance of direct access from the north/south traveling roadways section of SH21 to the westerly boundary of the subdivision. The only access points will be from local roadways on Bradley Rd. and possibly Fontaine Blvd. and by following the State Highway Access Code.
- d. Legacy Hill Drive access may be converted to RI/RO in the future if traffic issues arise or future traffic warrants are met to close this proposed full movement access crossing. A roudabout circle should be pursued at this location.
- e. Escrow funds will be required as a term and condition of Access Permit for a portion of the future SH21A(Powers Blvd.) / Bradley Rd. interchange based on a pro-rata share determined by the traffic impact study. Please add graph or chart.

Additionally,

- a. On-premise and off-premise signing shall comply with the current Colorado Outdoor Advertising Act, sections 43-1-401 to 421, C.R.S., and all rules and regulations pertaining to outdoor advertising. Please contact Mr. Todd Ausbun at (719) 696-1403 for any questions regarding advertising devices.
- b. Any utility work within the state highway right of way will require a utility permit from the CDOT. Information for obtaining a utility permit can also be obtained by contacting Mr. Ausbun.

Please contact me in Pueblo at (719) 248-0905 with any questions.

Sincerely,

Arthur Gonzales  
R2 - Access Manager

Xc: Irvine/Rice  
Ferguson

# Channel Report

## Powers Boulevard - 60-Inch Culvert

### Circular

Diameter (ft) = 5.00

Invert Elev (ft) = 1.00

Slope (%) = 2.56

N-Value = 0.020

### Calculations

Compute by: Q vs Depth

No. Increments = 20

### Highlighted

Depth (ft) = 4.75

Q (cfs) = 291.02

Area (sqft) = 19.28

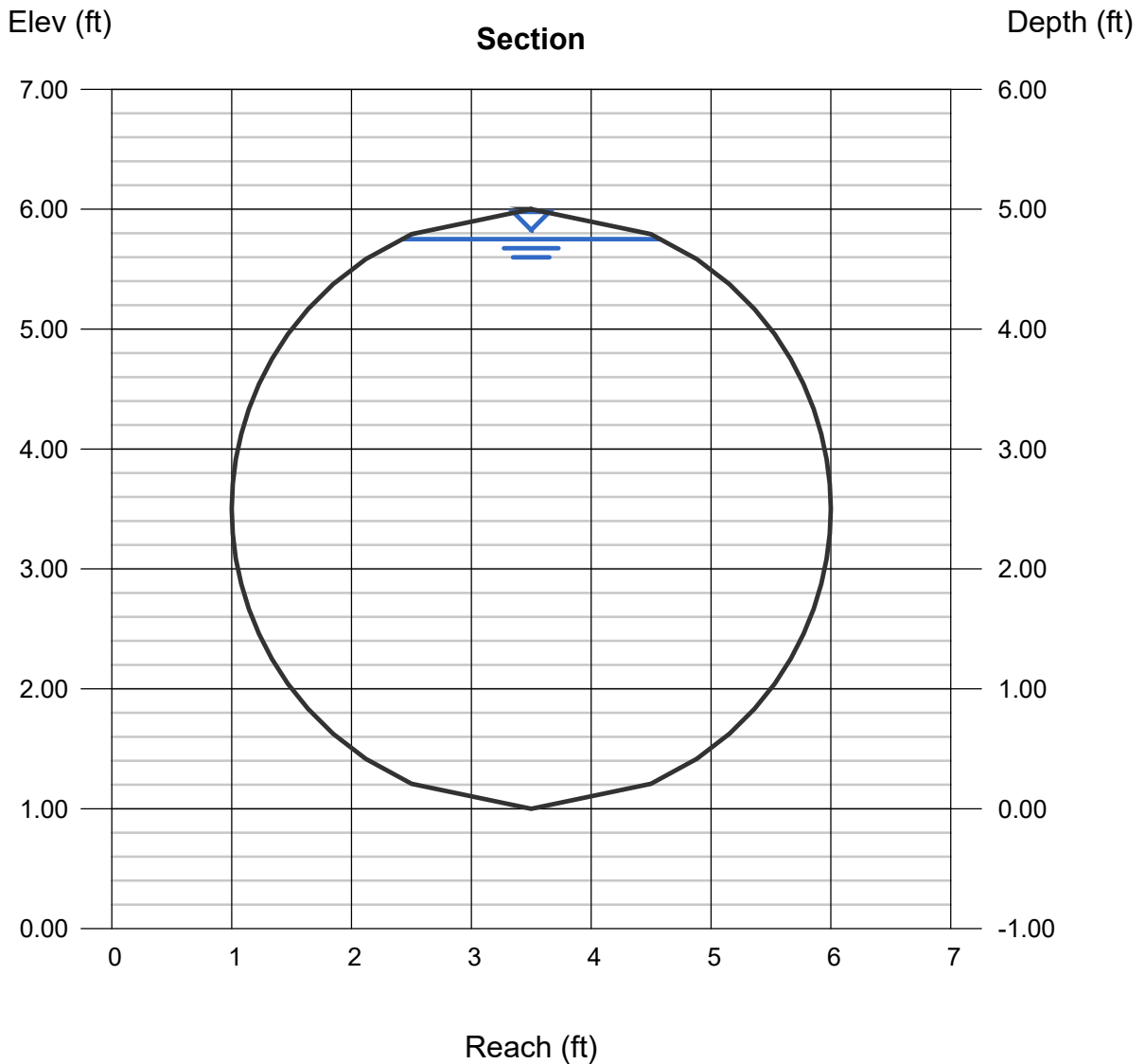
Velocity (ft/s) = 15.10

Wetted Perim (ft) = 13.48

Crit Depth,  $Y_c$  (ft) = 4.63

Top Width (ft) = 2.16

EGL (ft) = 8.29



# Channel Report

## Powers Ditch: Total flows including Ultimate West Pond Discharge

### User-defined

Invert Elev (ft) = 5866.90  
Slope (%) = 1.90  
N-Value = 0.025

### Highlighted

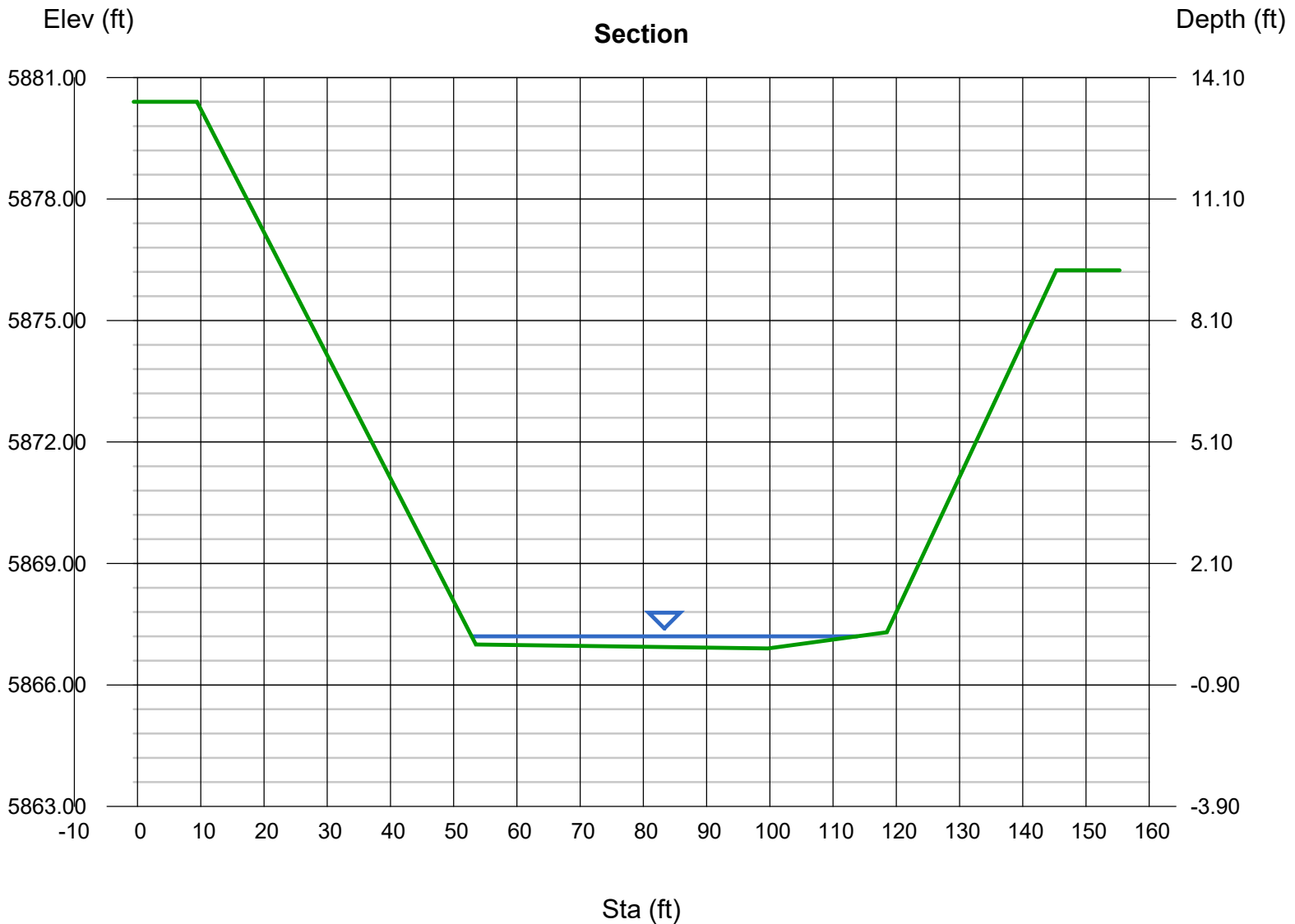
Depth (ft) = 0.30  
Q (cfs) = 41.10  
Area (sqft) = 13.72  
Velocity (ft/s) = 3.00  
Wetted Perim (ft) = 60.98  
Crit Depth, Yc (ft) = 0.32  
Top Width (ft) = 60.95  
EGL (ft) = 0.44

### Calculations

Compute by: Known Q  
Known Q (cfs) = 41.10

### (Sta, El, n)-(Sta, El, n)...

(9.40, 5880.40)-(53.50, 5867.00, 0.025)-(99.70, 5866.90, 0.025)-(118.50, 5867.30, 0.025)-(145.30, 5876.24, 0.025)



# Channel Report

## Powers 60-inch Culvert - Minor Storm Event

### Circular

Diameter (ft) = 5.00

Invert Elev (ft) = 5864.64

Slope (%) = 2.55

N-Value = 0.020

### Calculations

Compute by: Known Q

Known Q (cfs) = 9.45

### Highlighted

Depth (ft) = 0.64

Q (cfs) = 9.450

Area (sqft) = 1.48

Velocity (ft/s) = 6.37

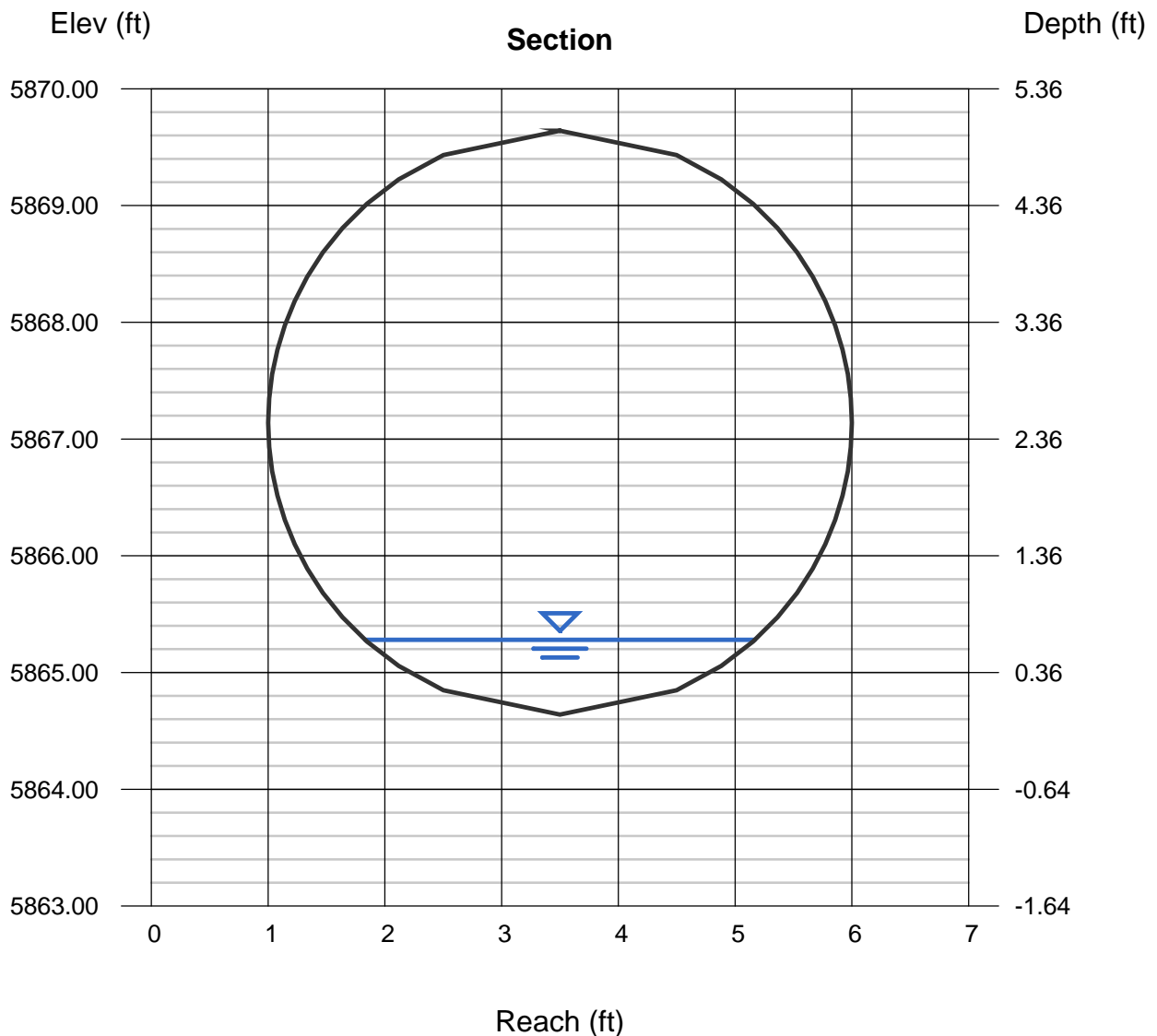
Wetted Perim (ft) = 3.67

Crit Depth, Yc (ft) = 0.85

Top Width (ft) = 3.35

EGL (ft) = 1.27

CDOT Drainage Design  
Manual, Page 9-20:  
Minimum Velocity for  
Minor Event = 3 ft/s



# Channel Report

## Powers 60-Inch Culvert - Major Storm Event

### Circular

Diameter (ft) = 5.00  
  
Invert Elev (ft) = 5864.64  
Slope (%) = 2.55  
N-Value = 0.020

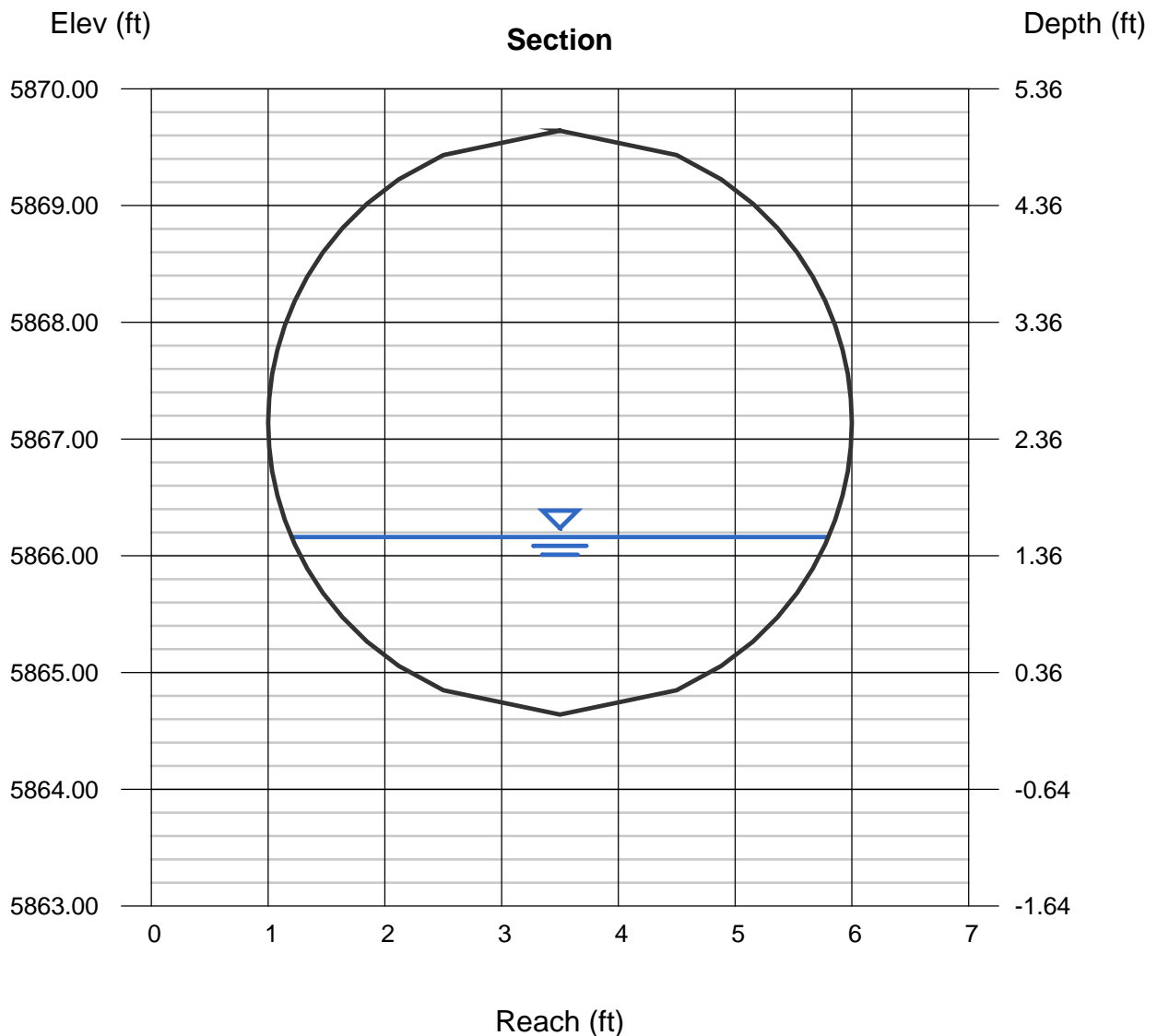
### Highlighted

Depth (ft) = 1.52  
Q (cfs) = 54.26  
Area (sqft) = 5.07  
Velocity (ft/s) = 10.71  
Wetted Perim (ft) = 5.85  
Crit Depth, Yc (ft) = 2.07  
Top Width (ft) = 4.60  
EGL (ft) = 3.30

### Calculations

Compute by: Known Q  
Known Q (cfs) = 54.26

Note: Maximum Discharge (54.26 cfs) to the Powers Ditch will be slightly lower than the estimated pre-project value of 59.6 cfs (Based on a 44.9 Acre Tributary Area). No downstream issues are anticipated.



# Channel Report

## 48-Inch Diameter Powers Boulevard Culvert Q5 Event

### Circular

Diameter (ft) = 4.00

Invert Elev (ft) = 5845.05

Slope (%) = 2.50

N-Value = 0.020

### Calculations

Compute by:

Known Q (cfs)

Known Q

= 5.80

### Highlighted

Depth (ft) = 0.54

Q (cfs) = 5.800

Area (sqft) = 1.02

Velocity (ft/s) = 5.67

Wetted Perim (ft) = 3.02

Crit Depth, Yc (ft) = 0.70

Top Width (ft) = 2.74

EGL (ft) = 1.04

CDOT Drainage Design Manual, Page 9-20: Minimum Velocity for Minor Event = 3 ft/s

