

**FINAL DRAINAGE REPORT AMENDMENT  
PARKER POINTE  
PARKER, COLORADO**

**PREPARED FOR:  
PARKER & STROH, LLC  
PO BOX 867  
CRESTED BUTTE, CO 81224**

**CONTACT: BRAD WILLETT  
970-366-1271**



**6901 SOUTH PIERCE STREET, SUITE 315  
LITTLETON, CO 80128  
CONTACT: JERRY DAVIDSON, P.E.  
(303) 232-5255**

**JOB #2015-015**

**DECEMBER 14, 2023**

**FINAL DRAINAGE REPORT AMENDMENT  
PARKER POINTE  
PARKER, COLORADO**

**I. CERTIFICATION PAGE**

This report for the final design of Parker Pointe was prepared by me or under my direct supervision in accordance with the provisions of the Town of Parker Storm Drainage and Environmental Criteria Manual. I understand that the Town of Parker and its designated town authority do not and will not assume liability for drainage facilities designed by others.

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Jerry W. Davidson, P.E.  
Colorado P.E. License No. 30226  
For and on Behalf of  
Perception Design Group, Inc.

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Seal and Date

**FINAL DRAINAGE REPORT AMENDMENT  
PARKER POINTE  
PARKER, COLORADO**

## **II GENERAL LOCATION AND DESCRIPTION**

Site Location and Purpose:

This Final Drainage Report Amendment is prepared by Perception Design Group, Inc. as part of the Re-Plat submittal process for the Parker Pointe project proposed in Parker, Colorado. The re-plat area encompasses Lots 7 thru 15 of Parker Pointe Subdivision Filing No. 1.

The Re-Plat occupies approximately 8.5 acres. Its purpose is to reconfigure / combine the original 9 lots into 6 new lots.

## **III DRAINAGE BASINS**

Drainage Basins:

Basins L7 thru L15 represent lots 7 thru 15 in the original study. In this amendment basins L7 thru L10, IN2 and IN3, and a portion of basin L11 defined as new basin L11B are now combined to a single collection point at design point 25. Previous upstream collection piping is eliminated from this amendment. Basin L11B represents additional flow to design point 25 not accommodated in the original report. New calculations are attached indicating the provided stub to design point 25 is adequate to carry this additional flow.

The balance of original basin L11, now defined as L11A continues to flow to the original collection stub at design point 14. Since flow is reduced by basin L11B, the system downstream is adequate to accommodate this revision.

While basins L13 thru L15 experience minor changes to lot line locations, runoff to the main line system remains un-changed.

## **IV CONCLUSIONS**

The existing storm sewer system is adequate to carry amended flows as illustrated by the attached calculations. No additional analysis is needed for the detention and water quality facility as overall runoff and imperviousness is unchanged.

Perception Design Group, Inc.  
 6901 South Pierce Street, Suite 315  
 Littleton, Colorado 80128  
 (303) 232-8088 Fax (303) 232-5255

Designed by: JWD  
 Checked by: JWD  
 Date: 18-Sep-17  
 Job Number: 2015-015

Project: Parker Pointe

**RUNOFF CALCULATIONS**

**(RATIONAL METHOD)**

Design Storm: 5-Yr.

|        |        | Direct Runoff |             |      |       |         |       |  |
|--------|--------|---------------|-------------|------|-------|---------|-------|--|
| Design | Basin  | Area          | Runoff      | CA   | Tc    | I       | Q     |  |
| Point  | Desig. | (Acres)       | Coefficient |      | (min) | (in/hr) | (cfs) |  |
|        | H1     | 10.52         | 0.09        | 0.95 | 26.0  | 2.30    | 2.18  |  |
|        | L1     | 0.71          | 0.81        | 0.58 | 5.0   | 4.70    | 2.70  |  |
|        | L2     | 0.50          | 0.81        | 0.41 | 5.0   | 4.70    | 1.90  |  |
|        | L2A    | 0.19          | 0.81        | 0.15 | 5.0   | 4.70    | 0.72  |  |
|        | L3     | 0.43          | 0.81        | 0.35 | 5.0   | 4.70    | 1.64  |  |
|        | L3A    | 0.16          | 0.81        | 0.13 | 5.0   | 4.70    | 0.61  |  |
|        | L4     | 0.63          | 0.81        | 0.51 | 5.0   | 4.70    | 2.40  |  |
|        | L4A    | 0.24          | 0.81        | 0.19 | 5.0   | 4.70    | 0.91  |  |
|        | L5     | 0.63          | 0.81        | 0.51 | 5.0   | 4.70    | 2.40  |  |
|        | L5A    | 0.24          | 0.81        | 0.19 | 5.0   | 4.70    | 0.91  |  |
|        | L6     | 0.78          | 0.81        | 0.63 | 5.0   | 4.70    | 2.97  |  |
|        | L7     | 0.68          | 0.81        | 0.55 | 5.0   | 4.70    | 2.59  |  |
|        | L8     | 0.87          | 0.81        | 0.70 | 5.0   | 4.70    | 3.31  |  |
|        | L9     | 0.71          | 0.81        | 0.58 | 5.0   | 4.70    | 2.70  |  |
|        | L10    | 0.88          | 0.81        | 0.71 | 5.0   | 4.70    | 3.35  |  |
|        | L11A   | 0.50          | 0.81        | 0.41 | 5.0   | 4.70    | 1.90  |  |
|        | L11B   | 0.42          | 0.81        | 0.34 | 5.0   | 4.70    | 1.60  |  |
|        | L12    | 0.56          | 0.81        | 0.45 | 5.0   | 4.70    | 2.13  |  |
|        | L13    | 0.73          | 0.81        | 0.59 | 5.0   | 4.70    | 2.78  |  |
|        | L14    | 0.73          | 0.81        | 0.59 | 5.0   | 4.70    | 2.78  |  |
|        | L15    | 0.72          | 0.81        | 0.58 | 5.0   | 4.70    | 2.74  |  |
|        | IN1    | 0.26          | 0.90        | 0.23 | 5.0   | 4.70    | 1.10  |  |
|        | IN2    | 0.53          | 0.90        | 0.48 | 5.0   | 4.70    | 2.24  |  |
|        | IN3    | 0.11          | 0.9         | 0.10 | 5.0   | 4.70    | 0.47  |  |
|        | SR1    | 3.75          | 0.18        | 0.68 | 22.4  | 2.60    | 1.76  |  |
|        | SR2    | 0.32          | 0.87        | 0.28 | 5.0   | 4.70    | 1.31  |  |
|        | PR1    | 0.42          | 0.77        | 0.32 | 5.0   | 4.70    | 1.52  |  |
|        | PR2    | 0.91          | 0.96        | 0.87 | 5.0   | 4.70    | 4.11  |  |
|        | U1     | 1.37          | 0.09        | 0.12 | 5.0   | 4.70    | 0.58  |  |
|        | U2     | 0.3           | 0.74        | 0.22 | 5.0   | 4.70    | 1.04  |  |
|        | U3     | 0.17          | 0.09        | 0.02 | 5.0   | 4.70    | 0.07  |  |
|        | U4     | 0.23          | 0.58        | 0.13 | 5.0   | 4.70    | 0.63  |  |
|        | OS1    | 23.34         | 0.13        | 3.03 | 25.5  | 2.50    | 7.59  |  |

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Project: Parker Pointe

**RUNOFF CALCULATIONS**  
**(RATIONAL METHOD)**

Design Storm: 100-Yr.

|                         |        | Direct Runoff |             |      |       |         |        |        |
|-------------------------|--------|---------------|-------------|------|-------|---------|--------|--------|
| Design                  | Basin  | Area          | Runoff      | CA   | Tc    | I       | Q      |        |
| Point                   | Desig. | (Acres)       | Coefficient |      | (min) | (in/hr) | (cfs)  |        |
|                         | H1     | 10.52         | 0.36        | 3.79 | 26.0  | 4.50    | 17.04  |        |
|                         | L1     | 0.71          | 0.88        | 0.62 | 5.0   | 8.85    | 5.53   |        |
|                         | L2     | 0.50          | 0.88        | 0.44 | 5.0   | 8.85    | 3.89   |        |
|                         | L2A    | 0.19          | 0.88        | 0.17 | 5.0   | 8.85    | 1.48   |        |
|                         | L3     | 0.43          | 0.88        | 0.38 | 5.0   | 8.85    | 3.35   |        |
|                         | L3A    | 0.16          | 0.88        | 0.14 | 5.0   | 8.85    | 1.25   |        |
|                         | L4     | 0.63          | 0.88        | 0.55 | 5.0   | 8.85    | 4.91   |        |
|                         | L4A    | 0.24          | 0.88        | 0.21 | 5.0   | 8.85    | 1.87   |        |
|                         | L5     | 0.63          | 0.88        | 0.55 | 5.0   | 8.85    | 4.91   |        |
|                         | L5A    | 0.24          | 0.88        | 0.21 | 5.0   | 8.85    | 1.87   |        |
|                         | L6     | 0.78          | 0.88        | 0.69 | 5.0   | 8.85    | 6.07   |        |
|                         | L7     | 0.68          | 0.88        | 0.60 | 5.0   | 8.85    | 5.30   |        |
|                         | L8     | 0.87          | 0.88        | 0.77 | 5.0   | 8.85    | 6.78   |        |
|                         | L9     | 0.71          | 0.88        | 0.62 | 5.0   | 8.85    | 5.53   |        |
|                         | L10    | 0.88          | 0.88        | 0.77 | 5.0   | 8.85    | 6.85   |        |
|                         | L11A   | 0.50          | 0.88        | 0.44 | 5.0   | 8.85    | 3.89   |        |
|                         | L11B   | 0.42          | 0.88        | 0.37 | 5.0   | 8.85    | 3.27   |        |
|                         | L12    | 0.56          | 0.88        | 0.49 | 5.0   | 8.85    | 4.36   |        |
|                         | L13    | 0.73          | 0.88        | 0.64 | 5.0   | 8.85    | 5.69   |        |
|                         | L14    | 0.73          | 0.88        | 0.64 | 5.0   | 8.85    | 5.69   |        |
|                         | L15    | 0.72          | 0.88        | 0.63 | 5.0   | 8.85    | 5.61   |        |
|                         | IN1    | 0.26          | 0.96        | 0.25 | 5.0   | 8.85    | 2.21   |        |
|                         | IN2    | 0.53          | 0.96        | 0.51 | 5.0   | 8.85    | 4.50   |        |
|                         | IN3    | 0.11          | 0.96        | 0.11 | 5.0   | 8.85    | 0.93   |        |
|                         | SR1    | 3.75          | 0.42        | 1.58 | 22.4  | 4.90    | 7.72   |        |
| TOTAL FLOW TO FOREBAY   |        |               |             |      |       |         |        | 103.45 |
|                         | OS1    | 23.34         | 0.39        | 9.10 | 25.5  | 4.50    | 40.96  |        |
| TOTAL TO POND           |        | 39.30         |             |      |       |         | 144.41 |        |
|                         | U1     | 1.37          | 0.36        | 0.49 | 25.5  | 4.50    | 2.22   |        |
|                         | U2     | 0.3           | 0.84        | 0.25 | 25.5  | 4.50    | 1.13   |        |
|                         | U3     | 0.17          | 0.36        | 0.06 | 25.5  | 4.50    | 0.28   |        |
|                         | U4     | 0.23          | 0.73        | 0.17 | 25.5  | 4.50    | 0.76   |        |
| UN-CAPTURED SITE RUNOFF |        |               |             |      |       |         |        | 4.38   |
|                         | SR2    | 0.32          | 0.94        | 0.30 | 5.0   | 8.85    | 2.66   |        |
|                         | PR1    | 0.42          | 0.86        | 0.36 | 5.0   | 8.85    | 3.20   |        |
|                         | PR2    | 0.91          | 0.96        | 0.87 | 5.0   | 8.85    | 7.73   |        |

## Project Description

File Name ..... System A Re-Plat 5 yr.SPF

## Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... Rational  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Kinematic Wave  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods ..... NO

## Analysis Options

Start Analysis On ..... Dec 05, 2023 00:00:00  
 End Analysis On ..... Dec 05, 2023 00:05:00  
 Start Reporting On ..... Dec 05, 2023 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:00:01 days hh:mm:ss  
 Routing Time Step ..... 1 seconds

## Number of Elements

|                              | Qty |
|------------------------------|-----|
| Rain Gages .....             | 0   |
| Subbasins.....               | 0   |
| Nodes.....                   | 5   |
| <i>Junctions</i> .....       | 2   |
| <i>Outfalls</i> .....        | 1   |
| <i>Flow Diversions</i> ..... | 0   |
| <i>Inlets</i> .....          | 2   |
| <i>Storage Nodes</i> .....   | 0   |
| Links.....                   | 4   |
| <i>Channels</i> .....        | 0   |
| <i>Pipes</i> .....           | 4   |
| <i>Pumps</i> .....           | 0   |
| <i>Orifices</i> .....        | 0   |
| <i>Weirs</i> .....           | 0   |
| <i>Outlets</i> .....         | 0   |
| Pollutants .....             | 0   |
| Land Uses .....              | 0   |

## Rainfall Details

Return Period..... 2 year(s)

## Node Summary

| SN Element ID     | Element Type | Invert Elevation (ft) | Ground/Rim (Max) Elevation (ft) | Initial Water Elevation (ft) | Surcharge Elevation (ft) | Ponded Area (ft <sup>2</sup> ) | Peak Inflow (cfs) | Max HGL Elevation (ft) | Max Surcharge Depth Attained (ft) | Min Freeboard (ft) | Time of Peak Flooding Occurrence (days hh:mm) | Total Flooded Volume (ac-in) | Total Time Flooded (min) |
|-------------------|--------------|-----------------------|---------------------------------|------------------------------|--------------------------|--------------------------------|-------------------|------------------------|-----------------------------------|--------------------|---|------------------------------|--------------------------|
| 1 15              | Junction     | 5965.73               | 5976.20                         | 5965.73                      | 5976.20                  | 0.00                           | 16.26             | 5967.15                | 0.00                              | 9.05               | 0 00:00                                       | 0.00                         | 0.00                     |
| 2 16              | Junction     | 5964.67               | 5976.62                         | 5964.67                      | 5976.62                  | 0.00                           | 19.23             | 5966.62                | 0.00                              | 10.00              | 0 00:00                                       | 0.00                         | 0.00                     |
| 3 Out-1Pipe - (6) | Outfall      | 5964.42               |                                 |                              |                          |                                | 19.23             | 5965.76                |                                   |                    |   |                              |                          |

## Junction Results

| SN Element ID | Peak Inflow | Peak Lateral Inflow | Max HGL Elevation Attained | Max HGL Depth Attained | Max Surchage Depth Attained | Min Freeboard Attained | Average HGL Elevation Attained | Average HGL Depth Attained | Time of Max HGL Occurrence | Time of Peak Flooding Occurrence | Total Flooded Volume | Total Time Flooded |
|---------------|-------------|---------------------|----------------------------|------------------------|-----------------------------|------------------------|--------------------------------|----------------------------|----------------------------|----------------------------------|----------------------|--------------------|
|               | (cfs)       | (cfs)               | (ft)                       | (ft)                   | (ft)                        | (ft)                   | (ft)                           | (ft)                       | (days hh:mm)               | (days hh:mm)                     | (ac-in)              | (min)              |
| 1 15          | 16.26       | 0.00                | 5967.15                    | 1.42                   | 0.00                        | 9.05                   | 5967.08                        | 1.35                       | 0 00:05                    | 0 00:00                          | 0.00                 | 0.00               |
| 2 16          | 19.23       | 0.00                | 5966.62                    | 1.95                   | 0.00                        | 10.00                  | 5966.62                        | 1.95                       | 0 00:00                    | 0 00:00                          | 0.00                 | 0.00               |

## Pipe Input

| SN Element ID | Length (ft) | Inlet Invert Elevation (ft) | Inlet Invert Offset (ft) | Outlet Invert Elevation (ft) | Outlet Invert Offset (ft) | Total Drop (ft) | Average Slope (%) | Pipe Shape | Pipe Diameter or Height (in) | Pipe Width (in) | Manning's Roughness | Entrance Losses | Exit/Bend Losses | Additional Losses | Initial Flow (cfs) | Flap Gate |
|---------------|-------------|-----------------------------|--------------------------|------------------------------|---------------------------|-----------------|-------------------|------------|------------------------------|-----------------|---------------------|-----------------|------------------|-------------------|--------------------|-----------|
| 1 Pipe - (12) | 12.00       | 5966.41                     | 0.00                     | 5966.17                      | 1.50                      | 0.24            | 2.0000            | CIRCULAR   | 18.000                       | 18.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |
| 2 Pipe - (4)  | 192.83      | 5966.89                     | 0.00                     | 5965.93                      | 0.20                      | 0.96            | 0.5000            | CIRCULAR   | 36.000                       | 36.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |
| 3 Pipe - (5)  | 172.41      | 5965.73                     | 0.00                     | 5964.87                      | 0.20                      | 0.86            | 0.5000            | CIRCULAR   | 36.000                       | 36.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |
| 4 Pipe - (6)  | 48.83       | 5964.67                     | 0.00                     | 5964.42                      | 0.00                      | 0.24            | 0.5000            | CIRCULAR   | 36.000                       | 36.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |

No. of  
Barrels

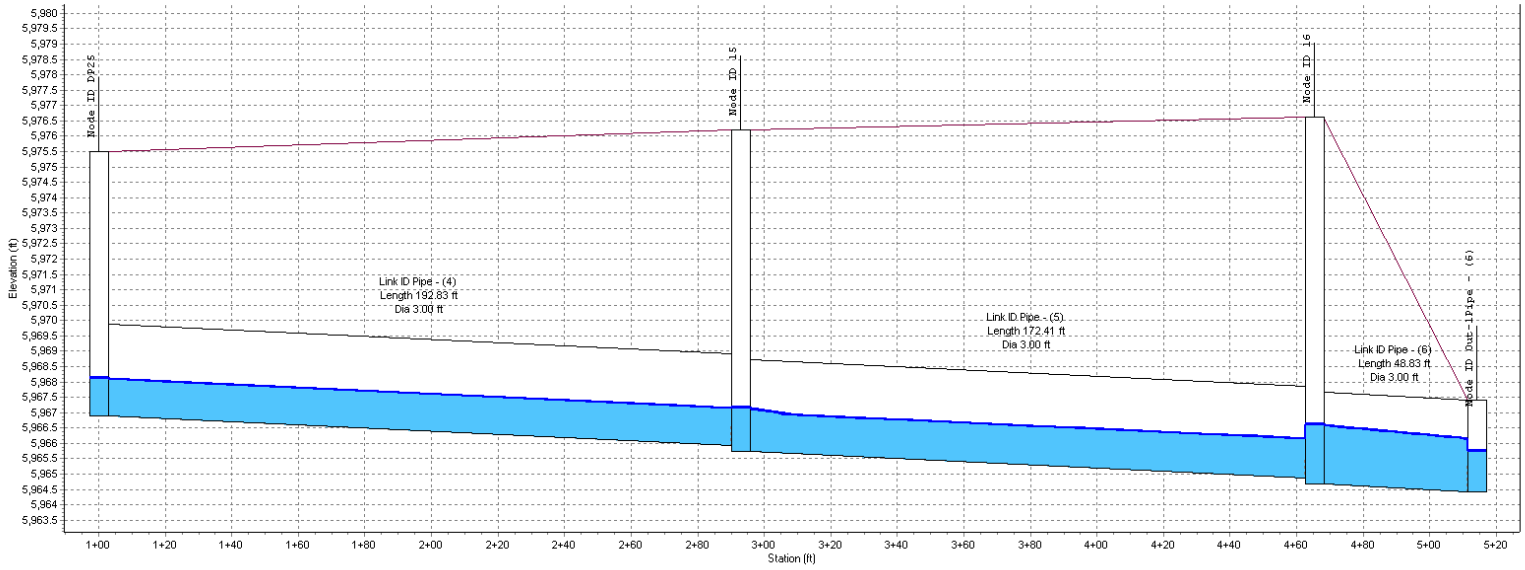
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1  
1  
1  
1

## Pipe Results

| SN Element ID | Peak Flow | Time of Peak Flow Occurrence | Design Flow Capacity | Peak Flow/Design Flow Ratio | Peak Flow Velocity | Travel Time | Peak Flow Depth | Peak Flow Depth/Total Depth Ratio | Total Time Surcharged | Froude Number | Reported Condition |
|---------------|-----------|------------------------------|----------------------|-----------------------------|--------------------|-------------|-----------------|-----------------------------------|-----------------------|---------------|--------------------|
|               | (cfs)     | (days hh:mm)                 | (cfs)                |                             | (ft/sec)           | (min)       | (ft)            |                                   | (min)                 |               |                    |
| 1 Pipe - (12) | 2.97      | 0 00:00                      | 14.86                | 0.20                        | 6.56               | 0.03        | 0.45            | 0.30                              | 0.00                  |               | Calculated         |
| 2 Pipe - (4)  | 16.26     | 0 00:05                      | 47.16                | 0.34                        | 6.05               | 0.53        | 1.22            | 0.41                              | 0.00                  |               | Calculated         |
| 3 Pipe - (5)  | 16.26     | 0 00:05                      | 47.16                | 0.34                        | 6.05               | 0.47        | 1.22            | 0.41                              | 0.00                  |               | Calculated         |
| 4 Pipe - (6)  | 19.23     | 0 00:05                      | 47.16                | 0.41                        | 6.33               | 0.13        | 1.33            | 0.44                              | 0.00                  |               | Calculated         |

Profile Plot  
Main Street Storm Sewer



|                     |            |            |            |                 |
|---------------------|------------|------------|------------|-----------------|
| Node ID:            | DP25       | 15         | 16         | Out-1Pipe - (6) |
| Rim (ft)            | 5975.50    | 5976.20    | 5976.62    |                 |
| Invert (ft)         | 5966.89    | 5965.73    | 5964.67    | 5964.42         |
| Min Pipe Cover (ft) |            | 7.27       | 8.75       |                 |
| Max HGL (ft)        | 5968.11    | 5967.15    | 5966.62    | 5965.76         |
| Link ID:            | Pipe - (4) | Pipe - (5) | Pipe - (6) |                 |
| Length (ft)         | 192.83     | 172.41     | 48.83      |                 |
| Dia (ft)            | 3.00       | 3.00       | 3.00       |                 |
| Slope (ft/ft)       | 0.0050     | 0.0050     | 0.0050     |                 |
| Up Invert (ft)      | 5966.89    | 5965.73    | 5964.67    |                 |
| Dn Invert (ft)      | 5965.33    | 5964.87    | 5964.42    |                 |
| Max Q (cfs)         | 16.26      | 16.26      | 19.23      |                 |
| Max Vel (ft/s)      | 6.05       | 6.05       | 6.33       |                 |
| Max Depth (ft)      | 1.22       | 1.22       | 1.33       |                 |

## Project Description

File Name ..... System A Re-Plat 100 yr.SPF

## Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... Rational  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Kinematic Wave  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods ..... NO

## Analysis Options

Start Analysis On ..... Dec 05, 2023 00:00:00  
 End Analysis On ..... Dec 05, 2023 00:05:00  
 Start Reporting On ..... Dec 05, 2023 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:00:01 days hh:mm:ss  
 Routing Time Step ..... 1 seconds

## Number of Elements

|                              | Qty |
|------------------------------|-----|
| Rain Gages .....             | 0   |
| Subbasins.....               | 0   |
| Nodes.....                   | 5   |
| <i>Junctions</i> .....       | 2   |
| <i>Outfalls</i> .....        | 1   |
| <i>Flow Diversions</i> ..... | 0   |
| <i>Inlets</i> .....          | 2   |
| <i>Storage Nodes</i> .....   | 0   |
| Links.....                   | 4   |
| <i>Channels</i> .....        | 0   |
| <i>Pipes</i> .....           | 4   |
| <i>Pumps</i> .....           | 0   |
| <i>Orifices</i> .....        | 0   |
| <i>Weirs</i> .....           | 0   |
| <i>Outlets</i> .....         | 0   |
| Pollutants .....             | 0   |
| Land Uses .....              | 0   |

## Rainfall Details

Return Period..... 2 year(s)

## Node Summary

| SN Element ID     | Element Type | Invert Elevation (ft) | Ground/Rim (Max) Elevation (ft) | Initial Water Elevation (ft) | Surcharge Elevation (ft) | Ponded Area (ft <sup>2</sup> ) | Peak Inflow (cfs) | Max HGL Elevation (ft) | Max Surcharge Depth Attained (ft) | Min Freeboard (ft) | Time of Peak Flooding Occurrence (days hh:mm) | Total Flooded Volume (ac-in) | Total Time Flooded (min) |
|-------------------|--------------|-----------------------|---------------------------------|------------------------------|--------------------------|--------------------------------|-------------------|------------------------|-----------------------------------|--------------------|---|------------------------------|--------------------------|
| 1 15              | Junction     | 5965.73               | 5976.20                         | 5965.73                      | 5976.20                  | 0.00                           | 33.16             | 5967.79                | 0.00                              | 8.41               | 0 00:00                                       | 0.00                         | 0.00                     |
| 2 16              | Junction     | 5964.67               | 5976.62                         | 5964.67                      | 5976.62                  | 0.00                           | 39.23             | 5966.84                | 0.00                              | 9.79               | 0 00:00                                       | 0.00                         | 0.00                     |
| 3 Out-1Pipe - (6) | Outfall      | 5964.42               |                                 |                              |                          |                                | 39.23             | 5966.51                |                                   |                    |   |                              |                          |

## Junction Results

| SN Element ID | Peak Inflow | Peak Lateral Inflow | Max HGL Elevation Attained | Max HGL Depth Attained | Max Surge Depth Attained | Min Freeboard Attained | Average HGL Elevation Attained | Average HGL Depth Attained | Time of Max HGL Occurrence | Time of Peak Flooding Occurrence | Total Flooded Volume | Total Time Flooded |
|---------------|-------------|---------------------|----------------------------|------------------------|--------------------------|------------------------|--------------------------------|----------------------------|----------------------------|----------------------------------|----------------------|--------------------|
|               | (cfs)       | (cfs)               | (ft)                       | (ft)                   | (ft)                     | (ft)                   | (ft)                           | (ft)                       | (days hh:mm)               | (days hh:mm)                     | (ac-in)              | (min)              |
| 1 15          | 33.16       | 0.00                | 5967.79                    | 2.06                   | 0.00                     | 8.41                   | 5967.68                        | 1.95                       | 0 00:05                    | 0 00:00                          | 0.00                 | 0.00               |
| 2 16          | 39.23       | 0.00                | 5966.84                    | 2.17                   | 0.00                     | 9.79                   | 5966.83                        | 2.16                       | 0 00:00                    | 0 00:00                          | 0.00                 | 0.00               |

## Pipe Input

| SN Element ID | Length (ft) | Inlet Invert Elevation (ft) | Inlet Invert Offset (ft) | Outlet Invert Elevation (ft) | Outlet Invert Offset (ft) | Total Drop (ft) | Average Slope (%) | Pipe Shape | Pipe Diameter or Height (in) | Pipe Width (in) | Manning's Roughness | Entrance Losses | Exit/Bend Losses | Additional Losses | Initial Flow (cfs) | Flap Gate |
|---------------|-------------|-----------------------------|--------------------------|------------------------------|---------------------------|-----------------|-------------------|------------|------------------------------|-----------------|---------------------|-----------------|------------------|-------------------|--------------------|-----------|
| 1 Pipe - (12) | 12.00       | 5966.41                     | 0.00                     | 5966.17                      | 1.50                      | 0.24            | 2.0000            | CIRCULAR   | 18.000                       | 18.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |
| 2 Pipe - (4)  | 192.83      | 5966.89                     | 0.00                     | 5965.93                      | 0.20                      | 0.96            | 0.5000            | CIRCULAR   | 36.000                       | 36.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |
| 3 Pipe - (5)  | 172.41      | 5965.73                     | 0.00                     | 5964.87                      | 0.20                      | 0.86            | 0.5000            | CIRCULAR   | 36.000                       | 36.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |
| 4 Pipe - (6)  | 48.83       | 5964.67                     | 0.00                     | 5964.42                      | 0.00                      | 0.24            | 0.5000            | CIRCULAR   | 36.000                       | 36.000          | 0.0130              | 0.5000          | 0.5000           | 0.0000            | 0.00               | No        |

No. of  
Barrels

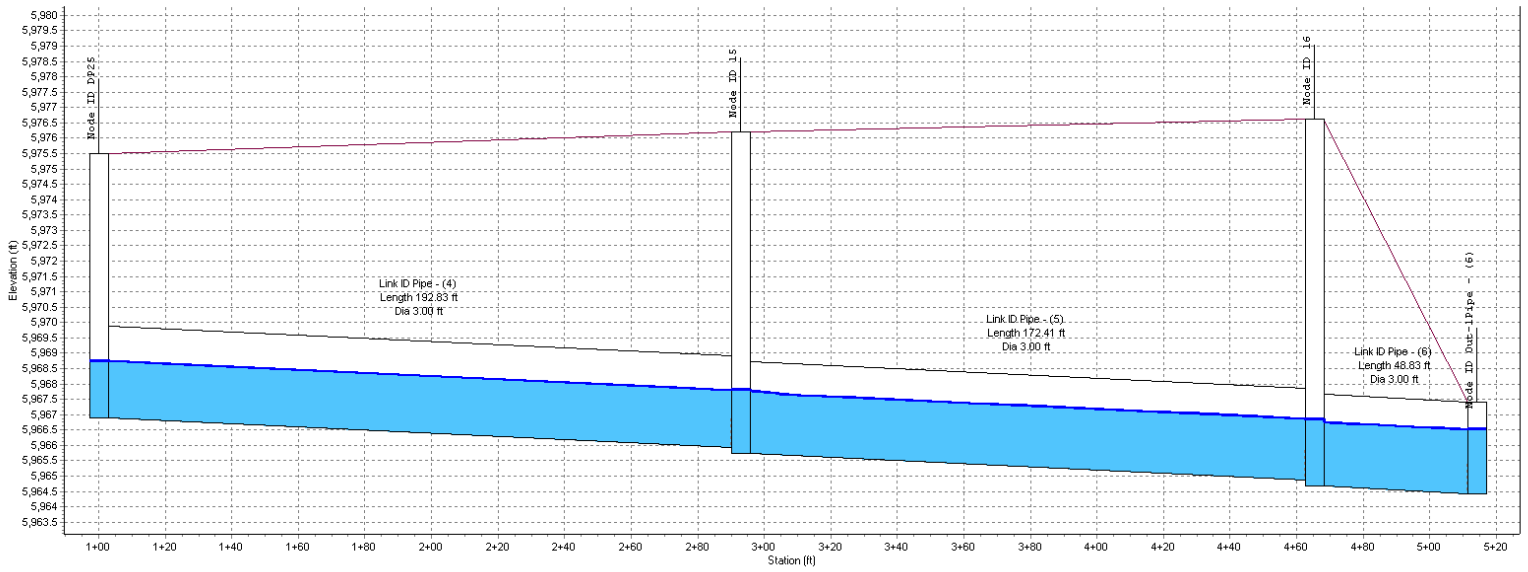
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1  
1  
1  
1

## Pipe Results

| SN Element ID | Peak Flow | Time of Peak Flow Occurrence | Design Flow Capacity | Peak Flow/ Design Flow Ratio | Peak Flow Velocity | Travel Time | Peak Flow Depth | Peak Flow Depth/ Total Depth Ratio | Total Time Surcharged | Froude Number | Reported Condition |
|---------------|-----------|------------------------------|----------------------|------------------------------|--------------------|-------------|-----------------|------------------------------------|-----------------------|---------------|--------------------|
|               | (cfs)     | (days hh:mm)                 | (cfs)                |                              | (ft/sec)           | (min)       | (ft)            |                                    | (min)                 |               |                    |
| 1 Pipe - (12) | 6.08      | 0 00:00                      | 14.86                | 0.41                         | 8.00               | 0.02        | 0.67            | 0.45                               | 0.00                  |               | Calculated         |
| 2 Pipe - (4)  | 33.16     | 0 00:05                      | 47.16                | 0.70                         | 7.22               | 0.45        | 1.86            | 0.62                               | 0.00                  |               | Calculated         |
| 3 Pipe - (5)  | 33.16     | 0 00:05                      | 47.16                | 0.70                         | 7.22               | 0.40        | 1.86            | 0.62                               | 0.00                  |               | Calculated         |
| 4 Pipe - (6)  | 39.23     | 0 00:05                      | 47.16                | 0.83                         | 7.46               | 0.11        | 2.09            | 0.70                               | 0.00                  |               | Calculated         |

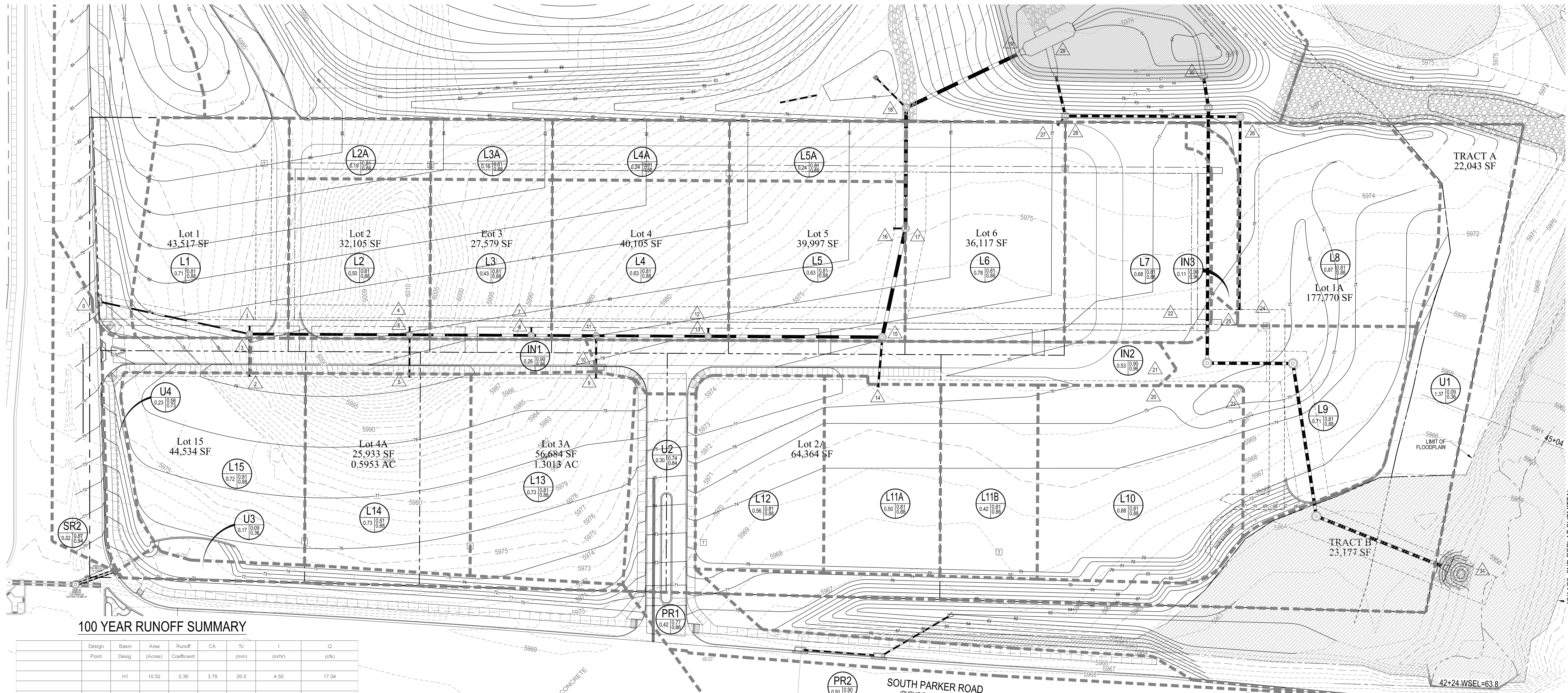
Profile Plot  
Main Street Storm Sewer



|                     |            |            |            |                 |
|---------------------|------------|------------|------------|-----------------|
| Node ID:            | DP25       | 15         | 16         | Out-1Pipe - (6) |
| Rim (ft)            | 5975.50    | 5976.20    | 5976.62    |                 |
| Invert (ft)         | 5966.89    | 5965.73    | 5964.67    | 5964.42         |
| Min Pipe Cover (ft) |            | 7.27       | 8.75       |                 |
| Max HGL (ft)        | 5968.75    | 5967.79    | 5966.84    | 5966.51         |
| Link ID:            | Pipe - (4) | Pipe - (5) | Pipe - (6) |                 |
| Length (ft)         | 192.83     | 172.41     | 48.83      |                 |
| Dia (ft)            | 3.00       | 3.00       | 3.00       |                 |
| Slope (ft/ft)       | 0.0050     | 0.0050     | 0.0050     |                 |
| Up Invert (ft)      | 5966.89    | 5965.73    | 5964.67    |                 |
| Dn Invert (ft)      | 5965.33    | 5964.87    | 5964.42    |                 |
| Max Q (cfs)         | 33.16      | 33.16      | 39.23      |                 |
| Max Vel (ft/s)      | 7.22       | 7.22       | 7.46       |                 |
| Max Depth (ft)      | 1.86       | 1.86       | 2.09       |                 |

SEE SHEET DP3

STROH ROAD



100 YEAR RUNOFF SUMMARY

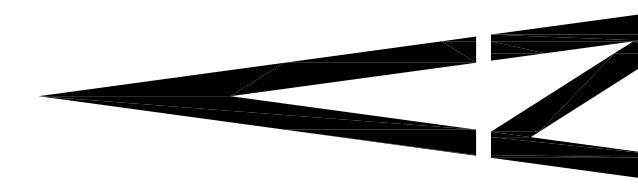
| Design Point            | Basin Desig. | Area (Acres) | Runoff Coefficient | CA   | Tc (min) | I (in/hr) | Q (cfs) |
|-------------------------|--------------|--------------|--------------------|------|----------|-----------|---------|
|                         | H1           | 10.52        | 0.36               | 3.79 | 26.0     | 4.50      | 17.04   |
|                         | L1           | 0.71         | 0.88               | 0.62 | 5.0      | 8.85      | 5.53    |
|                         | L2           | 0.50         | 0.88               | 0.44 | 5.0      | 8.85      | 3.89    |
|                         | L2A          | 0.19         | 0.88               | 0.17 | 5.0      | 8.85      | 1.48    |
|                         | L3           | 0.43         | 0.88               | 0.38 | 5.0      | 8.85      | 3.35    |
|                         | L3A          | 0.16         | 0.88               | 0.14 | 5.0      | 8.85      | 1.25    |
|                         | L4           | 0.63         | 0.88               | 0.55 | 5.0      | 8.85      | 4.91    |
|                         | L4A          | 0.24         | 0.88               | 0.21 | 5.0      | 8.85      | 1.87    |
|                         | L5           | 0.63         | 0.88               | 0.55 | 5.0      | 8.85      | 4.91    |
|                         | L5A          | 0.24         | 0.88               | 0.21 | 5.0      | 8.85      | 1.87    |
|                         | L6           | 0.78         | 0.88               | 0.69 | 5.0      | 8.85      | 6.07    |
|                         | L7           | 0.68         | 0.88               | 0.60 | 5.0      | 8.85      | 5.30    |
|                         | L8           | 0.87         | 0.88               | 0.77 | 5.0      | 8.85      | 6.78    |
|                         | L9           | 0.71         | 0.88               | 0.62 | 5.0      | 8.85      | 5.53    |
|                         | L10          | 0.88         | 0.88               | 0.77 | 5.0      | 8.85      | 6.85    |
|                         | L11A         | 0.50         | 0.88               | 0.44 | 5.0      | 8.85      | 3.89    |
|                         | L11B         | 0.42         | 0.88               | 0.37 | 5.0      | 8.85      | 3.27    |
|                         | L12          | 0.56         | 0.88               | 0.49 | 5.0      | 8.85      | 4.36    |
|                         | L13          | 0.73         | 0.88               | 0.64 | 5.0      | 8.85      | 5.69    |
|                         | L14          | 0.73         | 0.88               | 0.64 | 5.0      | 8.85      | 5.69    |
|                         | L15          | 0.72         | 0.88               | 0.63 | 5.0      | 8.85      | 5.61    |
|                         | IN1          | 0.26         | 0.96               | 0.25 | 5.0      | 8.85      | 2.21    |
|                         | IN2          | 0.53         | 0.96               | 0.51 | 5.0      | 8.85      | 4.50    |
|                         | IN3          | 0.11         | 0.96               | 0.11 | 5.0      | 8.85      | 0.93    |
|                         | SR1          | 3.75         | 0.42               | 1.58 | 22.4     | 4.90      | 7.72    |
| TOTAL FLOW TO FOREBAY   |              |              |                    |      |          |           | 103.45  |
|                         | OS1          | 23.34        | 0.39               | 9.10 | 25.5     | 4.50      | 40.96   |
| TOTAL TO POND           |              | 39.30        |                    |      |          |           | 144.41  |
|                         | U1           | 1.37         | 0.36               | 0.49 | 25.5     | 4.50      | 2.22    |
|                         | U2           | 0.31         | 0.84               | 0.25 | 25.5     | 4.50      | 1.13    |
|                         | U3           | 0.17         | 0.36               | 0.06 | 25.5     | 4.50      | 0.28    |
|                         | U4           | 0.23         | 0.73               | 0.17 | 25.5     | 4.50      | 0.76    |
| UN-CAPTURED SITE RUNOFF |              |              |                    |      |          |           | 4.38    |
|                         | SR2          | 0.32         | 0.94               | 0.30 | 5.0      | 8.85      | 2.66    |
|                         | PR1          | 0.42         | 0.86               | 0.36 | 5.0      | 8.85      | 3.20    |
|                         | PR2          | 0.91         | 0.96               | 0.87 | 5.0      | 8.85      | 7.73    |

DETENTION SUMMARY

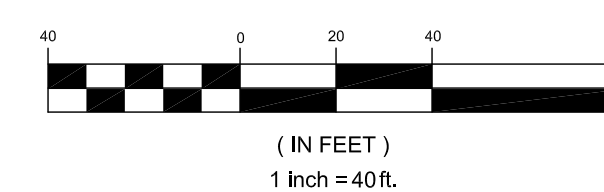
| ZONE      | VOLUME      | ELEVATION | RELEASE RATE |
|-----------|-------------|-----------|--------------|
| WOCV      | 0.566 AC-FT |           | 41 HOURS     |
| EURV+WOCV | 1.472 AC-FT | 5968.03   | 70 HOURS     |
| 100 YEAR  | 2.753 AC-FT | 5970.05   | 36.7 CFS     |

LEGEND

- 5340 --- EXISTING CONTOUR
- 42 --- PROPOSED CONTOUR
- R1** BASIN DESIGNATION
- 0.20 0.75 0.83 5 YR RUNOFF COEFFICIENT
- 100 YR RUNOFF COEFFICIENT
- BASIN AREA
- BASIN BOUNDARY LINE
- △ DESIGN POINT



GRAPHIC SCALE



BENCHMARK

BENCHMARK: DOUGLAS COUNTY SURVEY CONTROL MONUMENT TT15A - 3" DIAMETER DOUGLAS COUNTY GIS ALUMINUM CAP AT THE NE CORNER OF STROH ROAD AND SOUTH PARKER ROAD (US HIGHWAY 63)  
ELEVATION: 5970.79 FEET (NAVD 1988 DATUM)

DRAINAGE PLAN WEST

PREPARED UNDER THE DIRECT SUPERVISION OF JERRY W. DAVIDSON, P.E. COLORADO REG # 30226 FOR AND ON BEHALF OF PERCEPTION DESIGN GROUP, INC.

| DATE     | DESCRIPTION                             |
|----------|---|
| 12/14/23 | 2ND REPEAT SUBMITTAL                    |
| 08/01/23 | SECOND CDOT NTP SUBMITTAL               |
| 04/21/23 | CDOT NTP SUBMITTAL / PRE-PLAY SUBMITTAL |
| 04/11/22 | RESUBMITTAL                             |
| 11/01/18 | SIXTH SUBMITTAL                         |
| 08/31/18 | FOURTH SUBMITTAL                        |
| 05/25/18 | THIRD SUBMITTAL                         |
| 10/24/17 | INITIAL SUBMITTAL                       |

PARKER POINTE  
LOTS 1 THRU 15 AND TRACTS A AND B, PARKER POINTE FILING NO. 1  
SOUTHEAST CORNER PARKER ROAD AND STROH ROAD  
PARKER, COLORADO

design by: JWD  
approved by: JWD  
project no.: 2015-015

date: 10/01/17

SHEET

DP2

THE TOWN OF PARKER REVIEW CONSTITUTES GENERAL COMPLIANCE WITH THE TOWN'S STANDARDS AND APPROVED VARIANCES, SUBJECT TO THESE PLANS BEING STAMPED, SIGNED, AND DATED BY THE PROFESSIONAL ENGINEER OF RECORD. REVIEW BY THE TOWN DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY OR CORRECTNESS OF ENGINEERING CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN THE RESPONSIBILITY OF THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT.

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TOWN OF PARKER, DIRECTOR OF ENGINEERING

DATE

