Final Drainage Report
for
Compark Village South Single Family

Compark Village South, Filing No.1, Amendment 2
Parker, Colorado

Prepared For:

Century Communities
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Prepared By:
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Initially Submitted: 10/08/2021

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ENGINEER'S CERTIFICATE

This final drainage report amendment for the Compark Village South project 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.

Prepared By:

_____

Kristofer K. Wiest, P.E.
State of Colorado No. 46080
For and on Behalf of Merrick & Company

I. GENERAL LOCATION AND DESCRIPTION

A. Location

Compark Village South (CVS) Filing No. 1, Amendment 1 lies in what was previously referred to as Tract G. Compark Village South Single Family ((CVS-SF) hereinafter referred to as the "Site") is located in the South Half of Section 6, Township 6 South, Range 66 West of the Sixth Principal Meridian, Town of Parker, County of Douglas, State of Colorado, Tract A. General project boundaries include Deer Track Lane to the north, CVS Filing No. 1, Amendment 1, Tract B to the east, CVS Filing No. 1, Amendment 1, Tract K to the south, and Racoon Trail Way to the west.

B. Description of Property

The Site consists of approximately 7.686 acres and is currently undeveloped land with vegetation consisting of native grasses and shrubs. Prior to the commencement of construction activities at the Site, the Site will be mass graded per the Final Road & Storm Drainage Construction Plan for Compark South Filing No. 2, approved by the Town of Parker on February 24, 2021 and completed by Manhard Consulting LLC.. The design intent of the mass grading is for the Site to generally slope from south to north at 4-14% grades, with the steeper grades along the south side of the Site. The Site is anticipated to consist of 33 single-family lots with a private drive and utilities to serve the lots. The Site will include a paved street, curb and gutter, hardscaping, and landscaping. The proposed improvements will disturb most of the Site with excavation, grading, utility installation, hardscape, and other construction activities.

Adjacent subdivisions include Grand View Estates to the south, Stonegate to the southeast, Compark to the north and east, and Green Acres to the west. A Douglas County subdivision map has been included for reference in Appendix A.

There is a major drainage channel located south of the Site, Happy Canyon Creek, which is tributary Cherry Creek. There are also two regional detention basins, both of which are located along Belford Avenue, one to the north and one to the west.

There are two soil types on the Site as identified by the Natural Resource Conservation Service (NRCS) Web Soil Survey: Newlin Gravelly Sandy Loam, and Fondis Clay Loam. These soils are classified as hydrologic group B and C respectively. Newlin Gravelly Sandy Loam makes up the majority of the site leading to the storm pipes and inlets being sized assuming soil type B. Refer to Appendix E of this report for the soil survey.

C. Floodplain Information

The Site is located within the Happy Canyon Creek major drainage basin which has a regulatory 100-year floodplain. The FEMA regulatory floodplain is located off-site and southeast of the Site. FIRM map 08035C0062H, Effective date: September 4, 2020 indicates that the Site is located in Zone X which poses a minimal flood hazard. The Site construction activities will not negatively impact the floodplain. The FIRM map has been included in Appendix A for reference.

II. DRAINAGE BASINS AND SUB-BASINS

A. Basin Description

The Site lies within the Green Acres Tributary, which is a Tributary of Happy Canyon Creek, the Site is located approximately 1.5 miles upstream of the confluence. The Green Acres Tributary consists of approximately 1.4 square miles. Much of the basin is in the process of being developed, the Site is being completed in coordination with the Compark Village South Development Project (hereinafter referred to as CVS Development). The CVS Development will construct a regional detention basin located north of Belford Avenue and across from Wild Fox Street. The regional detention basin will provide water quality treatment and detention for the Site. Known previous drainage studies completed applicable to the Site have been listed below for reference:

- *UDFCD - Outfall System Planning - Happy Canyon Creek Watershed within Douglas County, prepared by Kiowa Consultants, June 1993*. MHFD, in conjunction with sponsor partners Town of Parker and Douglas County, are planning on updating the Happy Canyon Creek OSP.
- Green Acres Tributary is a part of the Happy Canyon Creek watershed. There are several existing drainage studies covering the upstream area of the Green Acres Tributary development projects. See the Meridian Office Park, Filings 4 & 5 master drainage analysis for further detail.
- *Happy Canyon Creek Major Drainageway Plan, prepared by Muller Engineering Company, March 2014.*
- *Amendment to Happy Canyon Creek Major Drainageway Plan, March 2014, prepared by Manhard Consulting, February 2016.*
- *Final Drainage Report Amendment – Compark Village South, Filing No. 1 Parker, Colorado prepared by Manhard Consulting, July 2020.*
- *Final Drainage Report – Compark Village South, Filing No. 1 – Belford Ave Site Plan Amendment Parker, Colorado. Prepared by Manhard Consulting June 2021* (hereinafter referred to as the CVS F1 Report).
- *Final Drainage Report – Compark Village South Filing No. 2 and Filing 2, Amd 1, Parker, Colorado. Prepared by Manhard Consulting July 2020* (hereinafter referred to as the CVS F2 Report).
- *Final Drainage Report for Green Acres Tributary Project prepared by RESPEC June 2020.*
- *Final Drainage Report for Compark Village South Multi-Family – Compark Village South, Filing No. 1, Amendment 2, Parker, Colorado. Prepared by Merrick and Company September 10, 2021* (hereinafter referred to as CVS MF Report). As of the date of this report, the above-mentioned report has not been approved and is in the review process with the Town of Parker.

The Site is within sub-basins CVS-14b, 15, 15A, 17, 17A, and 18 as described in the CVS F2 Report. All of the sub-basins as described within the report convey the peak storm runoff directly to the regional detention basin designed within the same report via two alternative routes described in further detail below. This detention basin will release restricted flows into an existing box culvert under E-470 and into the Green Acres Tributary (GAT) in compliance with the Master Drainage Report for Compark Village South and Town of Parker requirements.

B. Sub-Basin Description

The Site is comprised of 22 sub-basins. The proposed basins and design points are depicted on the drainage plan provided in Appendix A. These sub-basins have been determined based on land use, area, roadway slopes, storm sewer locations, and inlet capacities.

The following on-site sub-basins are captured by both proposed on-site and existing off-site storm sewer infrastructure and are conveyed to the regional detention pond to the western forebay, A1-3, B1, and C1, as well as the following off-site sub-basins, OS1-5.

The following on-site sub-basins are captured by both proposed on-site and existing off-site storm sewer infrastructure and are conveyed to the regional detention pond to the southern forebay, D1, E1-2, F1, G1, I1, and J1, as well as the following off-site sub-basins, OS6-7.

Basin A1 (0.33 acres)
The basin will remain mostly undisturbed with drainage patterns to the north per historical conditions. A proposed drainage swale will be constructed along the northern edge of the basin to capture on-site and off-site peak storm runoff and prevent it from overland conveyance through the single-family lots. The proposed drainage swale will convey captured runoff off-site to an existing CDOT Type C inlet (inlet 7-5 per the CVS F2 Report) located at design point 2. Runoff coefficients calculated are C_5=0.05 and C_{100}=0.49; the peak storm event flows are calculated as Q_5=0.0 cfs and Q_{100}=1.2 cfs.

Basin A2 (0.88 acres)
The basin will be developed into overlot grading for single-family homes and right-of-way improvements to include landscape and hardscape. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to a proposed 10’ Type R inlet to the west at design point 4. Runoff coefficients calculated are C_5=0.47 and C_{100}=0.70; the peak storm event flows are calculated as Q_5=1.0 cfs and Q_{100}=3.9 cfs.

Basin A3 (0.56 acres)
The basin will be developed into overlot grading for single-family homes and right-of-way improvements to include landscape and hardscape. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to a proposed 10’ Type R inlet to the west at design point 6. Runoff coefficients calculated are C_5=0.30 and C_{100}=0.38; the peak storm event flows are calculated as Q_5=0.6 cfs and Q_{100}=1.8 cfs.

Basin B1 (0.07 acres)
The basin will be developed into overlot grading for single-family homes. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to an existing 10’ Type R inlet to the northwest (inlet 6-5B per the CVS F2 Report) at design point 8. Runoff coefficients calculated are C_5=0.45 and C_{100}=0.69; the peak storm event flows are calculated as Q_5=0.1 cfs and Q_{100}=0.4 cfs.

Basin C1 (1.84 acres)
The basin will be developed into overlot grading for single-family homes. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to an existing 10’

Type R inlet to the northwest (inlet 5-5 per the CVS F2 Report) at design point 10. Runoff coefficients calculated are C_5=0.41 and C_{100}=0.67; the peak storm event flows are calculated as Q_5=2.7 cfs and Q_{100}=11.1 cfs.

Basin D1 (0.75 acres)
The basin will be developed into overlot grading for single-family homes. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to an existing 10' Type R inlet to the northwest (inlet 2-11 per the CVS F2 Report) at design point 12. Runoff coefficients calculated are C_5=0.41 and C_{100}=0.67; the peak storm event flows are calculated as Q_5=1.1 cfs and Q_{100}=4.5 cfs.

Basin E1 (0.32 acres)
The basin will be developed into overlot grading for single-family homes. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to a proposed 10' Type R inlet to the east at design point 13. Runoff coefficients calculated are C_5=0.37 and C_{100}=0.65; the peak storm event flows are calculated as Q_5=0.4 cfs and Q_{100}=1.7 cfs.

Basin F1 (0.69 acres)
The basin will be developed into overlot grading for single-family homes and right-of-way improvements to include landscape and hardscape. Runoff from the basin will sheet flow to the 4-inch mountable curb and gutter and conveyed to a proposed 10' Type R inlet to the east at design point 14. Runoff coefficients calculated are C_5=0.46 and C_{100}=0.69; the peak storm event flows are calculated as Q_5=0.8 cfs and Q_{100}=3.0 cfs.

Basin G1 (0.22 acres)
The basin will remain mostly undisturbed with drainage patterns to the north per historical conditions. A proposed drainage swale will be constructed along the northern edge of the basin to capture on-site and off-site peak storm runoff and prevent it from overland conveyance through the single-family lots. The proposed drainage swale will convey captured runoff off-site to a proposed CDOT Type C inlet with a closed mesh grate located at design point 17. Runoff coefficients calculated are C_5=0.05 and C_{100}=0.49; the peak storm event flows are calculated as Q_5=0.01 cfs and Q_{100}=0.9 cfs.

Basin G2 (0.06 acres)
The basin will consist of a proposed drainage swale which will convey the peak storm runoff to the north, where it will be captured at a low point with a proposed CDOT Type C inlet with a closed mesh grate at design point 17. Runoff coefficients calculated are C_5=0.05 and C_{100}=0.49; the peak storm event flows are calculated as Q_5=0.01 cfs and Q_{100}=0.3 cfs.

Basin H1 (0.11 acres)
The basin will be developed into right-of-way improvements to include landscape and hardscape. Runoff from the basin will sheet flow to curb and gutter where it will be conveyed off-site to an existing 10' Type R inlet (inlet A-5 per the CVS MF Report). Runoff coefficients calculated are C_5=0.49 and C_{100}=0.71; the peak storm event flows are calculated as Q_5=0.2 cfs and Q_{100}=0.7 cfs.

Basin I1 (0.63 acres)
The basin will be developed into a park/open space consisting of landscaping. Runoff from the basin will sheet flow and conveyed overland off-site. Runoff coefficients calculated are

C_5=0.06 and C_{100}=0.50; the peak storm event flows are calculated as Q_5=0.1 cfs and Q_{100}=2.5 cfs.

Basin J1 (1.22 acres)
The basin will be developed into a park/open space consisting of landscaping. Runoff from the basin will sheet flow to the north, where it will be captured at a low point with a proposed CDOT Type C inlet with a closed mesh grate at design point 21. Runoff coefficients calculated are C_5=0.05 and C_{100}=0.49; the peak storm event flows are calculated as Q_5=0.2 cfs and Q_{100}=4.6 cfs.

Basin OS1 (0.87 acres)
The basin will remain mostly undisturbed with drainage patterns to the north per historical conditions. A proposed drainage swale will be constructed along the northern edge of the basin to capture off-site peak storm runoff and prevent it from overland conveyance into Bunny Hop Lane right-of-way. The proposed drainage swale will convey captured runoff to an existing CDOT Type C inlet (inlet 7-5 per the CVS F2 Report) located at design point 2. Runoff coefficients calculated are C_5=0.08 and C_{100}=0.51; the peak storm event flows are calculated as Q_5=0.2 cfs and Q_{100}=2.7 cfs.

Basin OS2 (0.30 acres)
The basin will remain undeveloped and runoff from the basin will remain as it historically has as overland flow to the north. Runoff from the basin will be conveyed by 4-inch mountable curb and gutter east to a proposed 10’ Type R inlet at design point 4. Runoff coefficients calculated are C_5=0.08 and C_{100}=0.51; the peak storm event flows are calculated as Q_5=0.1 cfs and Q_{100}=0.9 cfs.

Basin OS3 (0.30 acres)
The basin will remain undeveloped and runoff from the basin will remain as it historically has as overland flow to the north. Runoff from the basin will be conveyed by 4-inch mountable curb and gutter east to an existing 15’ Type R inlet at design point 5 (inlet 6-5 per the CVS F2 Report). Runoff coefficients calculated are C_5=0.07 and C_{100}=0.50; the peak storm event flows are calculated as Q_5=0.1 cfs and Q_{100}=0.9 cfs.

Basin OS4 (0.16 acres)
The basin is comprised of existing right-of-way improvements, to include local residential roadway, sidewalk, and landscaping. Runoff from the basin will remain as it historically has, conveyed by 4-inch mountable curb and gutter north to an existing 10’ Type R on-grade inlet at design point 8 (inlet 6-5B per the CVS F2 Report). Runoff coefficients calculated are C_5=0.66 and C_{100}=0.80; the peak storm event flows are calculated as Q_5=0.4 cfs and Q_{100}=1.2 cfs.

Basin OS5 (0.31 acres)
The basin is comprised of existing right-of-way improvements, to include local residential roadway, sidewalk, and landscaping. Runoff from the basin will be conveyed by 4-inch mountable curb and gutter west to an existing 10’ Type R sump inlet at design point 10 (inlet 5-5 per the CVS F2 Report). Runoff coefficients calculated are C_5=0.64 and C_{100}=0.78; the peak storm event flows are calculated as Q_5=0.7 cfs and Q_{100}=2.5 cfs.

Basin OS6 (0.25 acres)
The basin is comprised of existing right-of-way improvements, to include local residential roadway, sidewalk, and landscaping. Runoff from the basin will be conveyed by 4-inch mountable curb and gutter east to an existing 10' Type R on-grade inlet at design point 10 (inlet 2-11 per the CVS F2 Report). Runoff coefficients calculated are C_5=0.61 and C_{100}=0.77; the peak storm event flows are calculated as Q_5=0.5 cfs and Q_{100}=1.7 cfs.

Basin OS7 (0.18 acres)
The basin will remain mostly undisturbed with drainage patterns to the north per historical conditions. Runoff will sheet flow across the basin to a proposed drainage swale and then conveyed to a proposed CDOT Type C inlet with a closed mesh grate located at design point 17. Runoff coefficients calculated are C_5=0.17 and C_{100}=0.55; the peak storm event flows are calculated as Q_5=0.1 cfs and Q_{100}=0.9 cfs.

III. DRAINAGE CHANNELS

A. Happy Canyon Creek

Happy Canyon Creek is a major basin that is tributary to Cherry Creek. The portion of Happy Canyon Creek thalweg that extends up near the Site is a natural sandy bottom channel. The thalweg has an existing natural meander bend located near the southeast corner of the Site. No apparent head cutting exists within this channel reach. The active channel is a dry stream bed the experiences active flows during wet seasonal conditions.

As previously stated, the site is located within the Zone X floodplain adjacent to Happy Canyon Creek. No major channel improvements are anticipated for Happy Canyon Creek with this project.

IV. DRAINAGE DESIGN CRITERIA

A. Regulations

This final drainage report is prepared in accordance with the *Town of Parker Storm Drainage Design (Addendum to the Urban Storm Drainage Criteria Manuals Volumes 1, 2, and 3)* and the *MHFD.*

No detention pond improvements are included as part of this project. Per the previously stated drainage reports, the regional detention pond to the north is sufficiently sized to accommodate the water quality and detention pond volumes for the Site.

B. Development Criteria Reference and Constraints

The previously mentioned CVS F1 & F2 Report prepared by Manhard Consulting created a couple of assumptions based on information at the time of designing the regional detention basin located north of Belford Avenue. In order to ensure the regional detention basins compliance with the Town of Parker and Mile High Flood Control Districts (MHFD) requirements, and the design as described in these reports, the Site is constrained to these

assumptions. If these assumptions are not met, additional design and modification is required to ensure the regional detention basins capability for providing the necessary water quality treatment and detention volumes it is designed to receive.

The CVS F1 Report assumed the future drainage basins, the imperviousness of these basins, and where runoff would be routed from these basins. 2.53 acres within the Site was assumed it would be developed into single family homes with a 48% overall imperviousness, the remaining 5.16 acres of the Site was assumed it would be developed into multi-family with an overall imperviousness of 75%. The overall assumed imperviousness of the Site is 66.1%, the improvements proposed within this report contain an overall imperviousness of 34%, well below that which the regional detention pond was designed for. The CVS F1 Report Contributory Drainage Areas to Det Basin Exhibit has been provided in Appendix A for reference, the exhibit has been marked up to depict the Site and the assumed development impervious areas for the Site.

In addition, the CVS F2 Report breaks out the future assumed developments into drainage sub-basins to be collected by two separate storm sewer systems taking alternative routes that outfall into the regional detention basin. Compliance with these assumptions must be met in order to ensure the existing storm sewer infrastructure operates per the original design. In order to ensure compliance with the CVS F2 Report a comparison of the peak storm event runoff rates captured at each inlet and design point was completed, Table 1 below depicts a brief summary of the findings (as of the date of this report, the analysis is still in progress and will be added with the next submittal). The CVS F2 Report Proposed Drainage Area Map – Filing No. 2 has been marked up with the Site and applicable notes and included for reference in Appendix A.

C. Hydrological Criteria

The minor storm design rainfall is the 5-year event, and the major storm design rainfall is the 100-year event. Runoff conveyance coefficients were calculated using the equations found in Table 6-4 of the *Urban Storm Drainage Criteria Manual.* Time of concentration calculations were based on land use as well as distance and slope of travel.

5-year and 100-year event storm flows are calculated using the Rational Method. Percent imperviousness values are from Town of Parker Strom Drainage and Environmental *Criteria* and are summarized below:

Description	Percent Impervious (%)
Parking lot: Paved	100
Roof Area	90
Lawns, Clayey Soil	2

Runoff coefficients are from Town of Parker *Criteria* using hydrologic Soil Group C.

Rainfall intensities (I) for the area are approximated by the equation:

$$I = \frac{28.5P_1}{(10+Tc)^{0.786}}$$

The 1-hour design point rainfall values (P_1) used are 1.39 for the 5-year rainfall and 2.60 for the 100-year rainfall per the Town of Parker Storm Drainage and Environmental Criteria Manual. T_c represents the time of concentration in minutes and consists of overland flow time plus travel time.

All hydrological calculations including a summary of the calculated minor and major rainfall event flows are provided in Appendix B. Basin maps are included in Appendix A.

D. Hydraulic Criteria

(As of the date of this report, the hydraulic analysis is still in progress and will be added with the next submittal)

On-site storm sewer inlets were sized using the *Urban Storm Drainage Criteria Manual* UD-Inlet spreadsheet version 5.01 as well as Hydraflow Express Extension for AutoCAD Civil 3D. On-site final storm sewer pipes were sized using the Hydraflow software to determine hydraulic grade lines (HGL).

All proposed storm sewer is sized to carry the 5-year storm event without surcharging the sewer and the 100-year storm event with the hydraulic grade line a minimum of 1 foot below the proposed ground surface. Based on the Hydraflow results, the 100-year pipe flows are contained inside the pipe. 5-year HGLs are assumed to be contained within the pipe as well.

Inlets are sized to capture the 5-year storm event and inlets in a sump are designed for the 100-yr event. Calculations are included in Appendix C.

V. DRAINAGE FACILITY DESIGN

A. General Concept

The overall intent of the drainage design for the Site is to comply with the previous drainage reports and tie-in to the existing regional detention pond located to the north.

The proposed drainage design conveys developed runoff via sheet flow and gutter flow to inlets with sizing in appendix C.

Offsite public improvements for conveyance of minor and major flows are considered as part of Basin A-2 (see further explanation in the next section).

Water quality and detention will be provided within the regional detention basin as described in the CVS F1 Report.

B. Specific Details

As mentioned previously in this report, the site will be divided into multiple drainage sub-basins. The onsite runoff will be routed through the site via gutters and sheet flow and intercepted by inlets in sump and on-grade conditions. Flows captured by the inlets will be routed via the storm sewer directly to the existing detention/water quality regional detention

pond. The detention pond has been sized to accommodate the flows resulting from the areas shown on the drainage map.

Water Quality and Maintenance

Stormwater quality is provided by the existing detention pond designed by Manhard and described within the previously stated drainage reports.

Temporary sediment and erosion control will be provided with silt fence, and diversion ditches. Inlet protection and rock socks will also be used to protect existing storm infrastructure and provide water quality measures during construction.

Appendices
Tables, figures, charts and drawings used for references and calculations can be found in the Appendices of this report.

- A provides a vicinity map, topographic map, soils maps, FEMA floodplain maps, and drainage basin maps;
- B provides the hydrologic calculations;
- C provides the hydraulic calculations;
- D provides stormwater quality baffle system details;
- E provides the excerpts from drainage studies referenced in this report.

VI. Environmental Protection Criteria

A. General

Site Drainage improvements are intended to minimize the impact to the environment. The previously installed improvements to the Happy Canyon Creek required permitting through FEMA. As part of this permitting process, requirements regarding potential impacts to wetland areas and to threatened and endangered species were identified and the proper permitting was obtained. Specifics can be found in the CLOMR for Happy Canyon Creek.

B. Construction BMP Plan

Construction BMPs shall be placed during construction to minimize soil erosion and the movement of sediment offsite. Construction BMPs shall be placed during the initial and interim phases of construction. The intent of the initial BMPs are to fulfill water quality objectives during the overlot and roadway rough grading phase of the project. Once the initial phase of earthmoving and rough grading is complete, interim BMP placement can be made. Interim BMPs are in place for fine grading, utility construction, and street construction. Construction plans will contain all appropriate Stormwater Management Details. In addition, a stormwater Management Plan will be prepared to meet the Town of Parker, State of Colorado, and EPA criteria.

VII. CONCLUSIONS

A. Compliance with the LSDC

The on-site drainage design complies with the Mile High Flood Control District's *Urban Storm Drainage Criteria Manual* and *Town of Parker Storm Drainage Design (Addendum to the Urban Storm Drainage Criteria Manuals Volumes 1, 2, and 3)*. The design is consistent with the drainage design proposed in the previously mentioned drainage reports

B. Drainage Concept

The drainage design will convey storm flows without causing damage. The site is not located within a FEMA designated floodplain.

REFERENCES

1. Town of Parker Storm Drainage and Environmental Criteria Manual (Addendum to Urban Storm Drainage Criteria Manuals Volumes 1, 2, and 3), Town of Parker – Stormwater, Town of Parker, Colorado, Revised February 2014.

2. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ accessed [July 24, 2021].

3. Mile High Flood Control District. Urban Storm Drainage Criteria Manual. Volume 1. Revised August 2018.

4. Mile High Flood Control District. Urban Storm Drainage Criteria Manual. Volume 2. Revised September 2017.

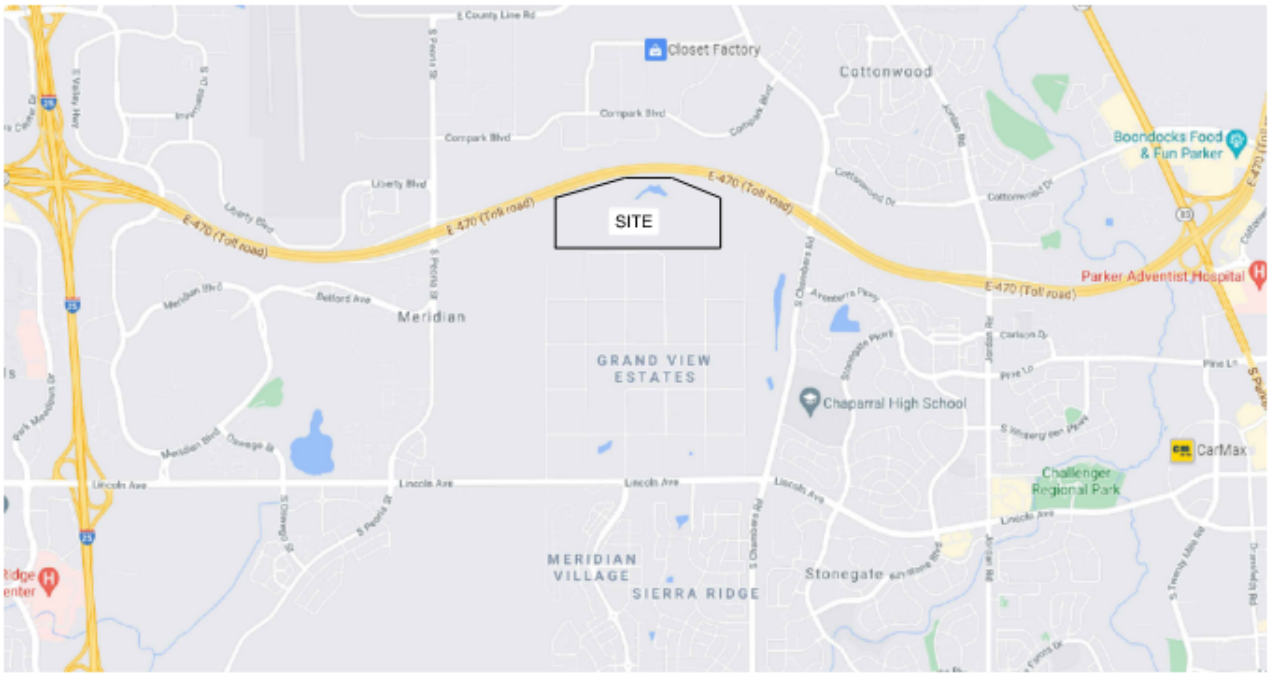
5. Urban Drainage and Flood Control District. Urban Storm Drainage Criteria Manual. Volume 3. Updated January 2021.

6. Manhard Consulting, LTD. Final Drainage Report Amendment Compark Village South, Filing No. 1. Prepared for 470 Compark, LLC. July 31, 2020.

7. Manhard Consulting, LTD. Final Drainage Report Compark Village South, Filing No. 1 - Belford Ave Site Plan Amendment. Prepared for Belford North Metropolitan District. June 18, 2021.

APPENDICES

Appendix A: Maps



Vicinity Map

(N.T.S.)

REGIONAL DETENTION POND

RUNOFF FROM AREA ENTERING THE STORM SYSTEM TO THE WEST AND THE WESTERN OUTFALL INTO THE REGIONAL DETENTION BASIN

RUNOFF FROM AREA ENTERING THE STORM SYSTEM TO THE EAST AND THE SOUTHERN OUTFALL INTO THE REGIONAL DETENTION BASIN

SITE

BELFORD AVE

PROPOSED DRAINAGE AREA MAP - FILING NO. 2

LEGEND

- SUB-BASIN #
- 2/5-YEAR RUNOFF COEFFICIENT (*DENOTES 5-YEAR RUNOFF)
- 100-YEAR RUNOFF COEFFICIENT
- AREA (ACRES)
- PROPOSED SUB-BASIN BOUNDARY

SCALE: 1"=100'

NOTE: BYPASS FLOWS NOT INTERCEPETED BY ON GRADE INLETS HAVE BEEN REDUCED BY 50% AND ADDED TO THE DIRECT FLOW AT THE NEXT DOWNHILL INLET PER SECTION 6.3.2 OF THE TOWN OF PARKER STORM DRAINAGE AND ENVIRONMENTAL CRITERIA MANUAL

2 YEAR STORM

Basin ID	Design Point	DIRECT RUNOFF Area (ac)	Tc (min.)	Runoff Coefficient C	Intensity, I (in/hr)	CA (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	INLET Intercepted (cfs)	STORM SEWER Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	REMARKS
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.28	4.3	1.19	**4.7**	**4.7**	0.0	8.9	3.1%	24		
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.69	4.3	0.97	**4.2**	**4.2**	0.0	4.2	10.0%	24		
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.55	4.4	0.52	**2.3**	**2.3**	2.3	0.0	2.3	1.7%	18	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.44	5.0	0.51	**2.5**	**2.5**	2.5	0.0	2.5	0.5%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.49	3.6	1.06	**3.9**	**3.9**	3.9	0.0	3.9	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.40	3.9	0.86	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.40	4.7	0.23	**1.1**	**1.1**	0.0	9.6	1.7%	36		
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.0	8.5	3.1%	36		
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.69	3.7	0.77	**2.9**	**2.9**	0.0	5.8	3.0%	24		
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.49	3.7	0.78	**2.9**	**2.9**	0.0	8.0	3.0%	24		
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.49	3.5	1.18	**4.1**	**4.1**	0.0	4.1	1.2%	18		
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.49	4.7	0.18	**0.9**	**0.9**	0.0	0.9	1.0%	18		
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.45	3.3	1.26	**4.2**	**4.2**	0.0	4.2	1.2%	18		
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.56	4.5	0.22	**1.0**	**1.0**	0.0	1.0	1.0%	18		
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.69	3.4	1.41	**4.9**	**4.9**	0.0	12.6	0.8%	36		
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.49	3.5	2.24	**7.9**	**7.9**	0.0	7.9	0.7%	36		
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.49	4.1	0.40	**1.6**	**1.6**	0.0	40.0	1.9%	42		
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.49	3.6	0.84	**2.3**	**2.3**	0.0	40.0	1.9%	42		
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.49	4.2	0.57	**2.4**	**2.4**	2.4	0.0	2.4	3.6%	18	
CVS-13A (Inlet 6-5A)	13A	1.20	6.7	0.55	4.0	0.65	**2.6**	**2.6**	2.6	0.0	2.6	1.0%	18	
CVS-13B (Inlet 4-5B)	13B	1.53	9.0	0.56	3.9	0.86	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS-13C (Inlet 4-5C)	13C	1.26	8.8	0.49	3.9	0.62	**2.4**	**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.49	3.6	0.85	**3.3**	**3.3**	3.3	0.0	3.3	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14B	2.73	13.4	0.07	3.3	0.19	**0.6**	**0.6**	0.0	3.6	3.4%	30		
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.51	3.6	0.99	**3.4**	**3.4**	3.4	0.0	3.4	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.05	13.4	0.49	3.3	1.00	**3.3**	**3.3**	0.0	3.3	5.0%	18		
CVS-15A (Inlet 5-5A)	15A	0.95	7.9	0.53	4.1	0.50	**2.0**	**2.0**	2.0	0.0	2.0	5.2%	18	
CVS-16 (Inlet 3-5A)	16	1.37	10.0	0.49	3.8	0.67	**2.5**	**2.5**	2.5	0.0	2.5	6.3%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.49	4.0	0.70	**1.9**	**1.9**	0.0	0.0	1.9	5.2%	18	
CVS-17A	17A	2.18	13.6	0.49	3.3	1.07	**3.5**	**3.5**	-	-	-	-	-	
CVS-18	18	2.69	12.0	0.45	3.5	1.20	**4.5**	**4.5**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.65	4.5	1.05	**4.7**	**4.7**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.49	3.7	0.68	**3.3**	**3.3**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.49	3.1	1.90	**5.8**	**5.8**	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.49	4.4	0.43	**1.9**	**1.9**	0.0	0.0	1.9	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.67	4.6	0.58	**2.7**	**2.7**	2.7	0.0	2.7	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.30	3.4	1.13	**3.8**	**3.8**	3.8	0.0	5.9	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.69	4.2	0.95	**3.9**	**3.9**	3.9	0.0	3.4	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.78	14.4	0.19	3.2	1.26	**4.1**	**4.1**	4.1	0.0	6.6	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.69	4.1	1.21	**5.0**	**5.0**	0.0	11.8	2.9%	36		
BEL-5	B5	4.55	11.0	0.68	3.6	3.09	**11.1**	**11.1**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.63	4.2	2.50	**10.5**	**10.5**	-	-	-	-	-	

5 YEAR STORM

Basin ID	Design Point	DIRECT RUNOFF Area (ac)	Tc (min.)	Runoff Coefficient C	Intensity, I (in/hr)	CA (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	INLET Intercepted (cfs)	STORM SEWER Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	REMARKS
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.33	4.3	1.27	**5.5**	**5.5**	5.5	0.0	10.0	3.1%	24	
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.72	4.3	1.03	**4.5**	**4.5**	4.5	0.0	4.5	10.0%	24	
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.58	4.4	0.54	**2.4**	**2.4**	2.4	0.0	2.4	1.7%	18	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.46	5.0	0.53	**2.6**	**2.6**	2.6	0.0	2.6	0.9%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.51	3.6	1.13	**4.0**	**4.0**	4.0	0.0	4.0	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.42	3.9	0.92	**3.6**	**3.6**	3.6	0.0	3.6	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.42	4.7	0.24	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.0	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.73	3.7	0.81	**3.0**	**3.0**	3.0	0.0	6.0	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.51	3.7	0.81	**3.0**	**3.0**	3.0	0.0	3.0	1.4%	24	
CVS-8 (Inlet 4-5A)	9	2.41	11.9	0.51	3.5	1.23	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.51	4.7	0.19	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.47	3.3	1.32	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.59	4.5	0.23	**1.1**	**1.1**	1.1	0.0	1.1	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.73	3.4	1.47	**5.1**	**5.1**	5.1	0.0	13.3	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.51	3.5	2.34	**8.2**	**8.2**	8.2	0.0	8.2	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.51	4.1	0.41	**1.7**	**1.7**	1.7	0.0	41.4	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.51	3.6	0.87	**2.4**	**2.4**	2.4	0.0	41.4	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.51	4.2	0.59	**2.5**	**2.5**	2.5	0.0	2.5	3.6%	18	
CVS-13A (Inlet 6-5A)	13A	1.20	6.7	0.58	4.0	0.69	**2.7**	**2.7**	2.7	0.0	2.7	1.0%	18	
CVS-13B (Inlet 4-5B)	13B	1.53	9.0	0.59	3.9	0.90	**3.5**	**3.5**	3.5	0.0	3.5	1.0%	18	
CVS-13C (Inlet 4-5C)	13C	1.26	8.8	0.51	3.9	0.64	**2.5**	**2.5**	2.5	0.0	2.5	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.51	3.6	0.87	**3.5**	**3.5**	3.5	0.0	8.5	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14B	2.73	13.4	0.07	3.3	0.20	**0.7**	**0.7**	0.0	8.9	3.4%	30		
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.51	3.6	0.99	**3.5**	**3.5**	3.5	0.0	3.5	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.05	13.4	0.49	3.3	1.03	**3.4**	**3.4**	0.0	3.4	5.0%	18		
CVS-15A (Inlet 5-5A)	15A	0.95	7.9	0.55	4.1	0.52	**2.1**	**2.1**	2.1	0.0	2.1	5.2%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.51	3.8	0.70	**2.6**	**2.6**	2.6	0.0	2.6	6.2%	18	
CVS-17 (Inlet 3-11)	17	1.44	8.4	0.51	4.0	0.74	**3.0**	**3.0**	3.0	0.0	6.8	5.2%	18	
CVS-18	18	2.69	12.0	0.47	3.5	1.25	**4.7**	**4.7**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.68	4.5	1.09	**4.9**	**4.9**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.51	3.7	0.92	**3.4**	**3.4**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.51	3.1	1.98	**6.1**	**6.1**	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.51	4.4	0.45	**2.0**	**2.0**	2.0	0.0	2.0	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.70	4.6	0.61	**2.8**	**2.8**	2.8	0.0	2.8	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.32	3.4	1.18	**4.0**	**4.0**	4.0	0.0	8.1	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.72	4.2	0.99	**4.1**	**4.1**	4.1	0.0	8.9	0.9%	30	
BEL-3 (Inlet 2-2)	B3	6.78	14.4	0.20	3.2	1.32	**4.2**	**4.2**	4.2	0.0	0.9	3.2%	30	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.73	4.1	1.27	**5.2**	**5.2**	5.2	0.0	12.1	2.9%	30	
BEL-5	B5	4.55	11.0	0.71	3.6	3.22	**11.5**	**11.5**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.66	4.2	2.61	**10.9**	**10.9**	-	-	-	-	-	

100 YEAR STORM

Basin ID	Design Point	DIRECT RUNOFF Area (ac)	Tc (min.)	Runoff Coefficient C	Intensity, I (in/hr)	CA (Acres)	Total Runoff, Q (cfs)	TOTAL RUNOFF Intensity, I (in/hr)	TOTAL RUNOFF CA (Acres)	INLET Total Runoff, Q (cfs)	INLET Bypass (cfs)	STORM SEWER Design Flow (cfs)	STORM SEWER Slope (%)	STORM SEWER Pipe Size (inches)	REMARKS
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.85	8.0	2.81	**20.2**			12.1	2.81	**20.2**	13.5	6.7	22.5	3.1%	24	Bypass Tributary to CVS-2
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.82	8.1	1.21	**9.9**			12.1	1.21	**9.9**	8.0	1.0	8.0	10.0%	24	Bypass Tributary to CVS-8
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.76	8.3	0.71	**5.9**			12.1	0.71	**12.6**	7.7	4.9	7.7	1.7%	18	Bypass Flow from Pond CVS-7, Bypass flows at CVS-7
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.65	9.3	0.81	**7.5**			12.1	0.81	**8.5**	8.0	0.5	8.0	0.9%	18	Flows from Pond CVS-7, Bypass flows to CVS-6
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.72	6.7	1.59	**10.7**						**11.2**	0.0	11.2	1.0%	18	Bypass flow from CVS-4
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.67	7.3	1.48	**10.8**			12.1	1.48	**10.8**	9.8	1.0	11.0	1.0%	18	Bypass flow from CVS-4A
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.67	8.8	0.39	**3.5**			12.1	0.39	**3.5**	3.5	0.0	51.3	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.46	8.8	0.36	**3.2**					**3.2**	3.2	0.0	51.0	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.84	7.0	0.93	**6.5**			12.1	0.93	**11.6**	7.3	4.1	15.4	3.0%	24	Flows from Pond CVS-11, Bypass flows to CVS-7
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.72	7.0	1.15	**8.1**			12.1	1.15	**8.6**	8.1	0.5	8.1	1.4%	24	Flows from Pond CVS-7, Bypass flows to CVS-12
CVS-8 (Inlet 4-5A)	9	2.41	11.9	0.72	6.8	1.74	**11.4**			12.1	1.74	**11.6**	10.2	1.4	10.2	1.2%	18	Bypass flow from CVS-7
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.72	8.8	0.27	**2.4**					**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.70	6.4	1.77	**11.9**			12.1	1.77	**11.9**	10.2	1.4	10.2	1.2%	18	Flows from Pond CVS-10A, Bypass flows to CVS-10
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.79	8.5	0.26	**2.6**					**2.6**	2.2	0.0	4.4	1.0%	18	Bypass Tributary to CVS-10
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.84	6.5	1.70	**11.9**			12.1	1.70	**55.1**	15.1	0.0	38.7	0.8%	36	Flows from Pond CVS-11, Bypass flows to CVS-12
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.72	6.8	3.31	**21.7**			12.1	3.31	**25.6**	22.5	0.0	22.6	0.7%	36	Flows from Pond CVS-12 and CVS-9
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.72	7.8	0.58	**4.6**					**4.6**	4.5	0.0	23.2	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.72	6.8	0.95	**6.6**					**8.4**	8.4	0.0	127.0	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.72	7.9	0.84	**6.6**			12.1	0.84	**6.9**	6.9	0.0	6.9	3.0%	18	Flows from Pond CVS-15A and CVS-15C, Bypass flows to CVS-13
CVS-13A (Inlet 6-5A)	13A	1.20	6.7	0.78	7.4	0.94	**6.9**					**6.9**	6.3	0.5	6.3	1.0%	18	Flows from Pond CVS-16, Bypass flows to CVS-13A
CVS-13B (Inlet 4-5B)	13B	1.53	9.0	0.79	7.3	1.17	**8.6**					**9.4**	6.9	2.5	6.9	1.0%	18	Flows from Pond CVS-13B, Bypass flows to CVS-13C
CVS-13C (Inlet 4-5C)	13C	1.26	8.8	0.72	7.4	0.91	**6.7**					**7.9**	7.9	4.0	7.9	1.0%	18	Flows from Pond CVS-13C, Bypass flows to CVS-13
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.72	6.7	1.27	**9.3**			12.1	1.37	**10.1**	10.1	0.0	54.4	3.2%	30	Bypass flows from CVS-14C
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.46	5.5	1.88	**10.2**					**10.2**	10.2	0.0	24.8	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.48	6.2	1.35	**8.4**					**8.5**	8.5	0.0	54.4	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.72	6.7	1.49	**9.9**					**9.9**	9.9	0.0	54.4	2.8%	18	Flows from Pond CVS-14B, Bypass flows to CVS-13A
CVS-15 (Inlet 5-5)	15	2.05	13.4	0.72	6.2	1.45	**9.0**			12.1	1.45	**9.1**	9.1	0.0	9.1	5.0%	18	Flows from Pond CVS-15A
CVS-15A (Inlet 5-5A)	15A	0.95	7.9	0.77	7.7	0.74	**5.4**					**11.4**	8.3	0.1	8.3	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.72	7.0	0.99	**7.0**					**7.0**	6.4	0.5	6.4	6.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.72	7.8	1.12	**8.7**					**7.8**	6.8	1.0	6.8	5.2%	18	
CVS-17A	17A	2.18	13.6	0.72	6.2	1.58	**9.7**											
CVS-18	18	2.69	12.0	0.70	7.0	1.88	**13.2**			12.1	1.88	-	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.81	8.4	1.31	**11.0**			12.1	1.31	-	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.72	6.9	1.20	**9.0**			12.1	1.20	-	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.72	5.8	2.81	**16.4**			12.1	2.81	-	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.72	8.3	0.63	**5.2**					**5.2**	5.0	0.2	5.0	1.0%	18	Flows from Pond CVS-14
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.82	8.6	0.73	**6.1**					**6.1**	7.1	0.5	6.1	1.0%	18	Flows from Pond CVS-7
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.52	6.3	2.31	**14.7**					**14.7**	8.3	6.4	43.6	3.3%	36	Bypass flows to BEL-3
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.82	7.8	1.16	**8.9**					**8.9**	6.5	2.4	69.5	0.9%	36	Bypass flows to BEL-3
BEL-3 (Inlet 2-2)	B3	6.78	14.4	0.56	5.9	3.76	**22.4**					**29.0**	29.0	0.0	56.4	3.2%	36	Bypass flows from BEL-2
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.84	7.7	1.46	**11.2**					**13.6**	13.6	0.0	112.8	2.9%	30	Flows from Basin BEL-2
BEL-5	B5	4.55	11.0	0.81	6.8	3.76	**20.5**			12.1	3.76	-	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.80	7.6	3.17	**24.9**			12.1	3.17	-	-	-	-	-	-	

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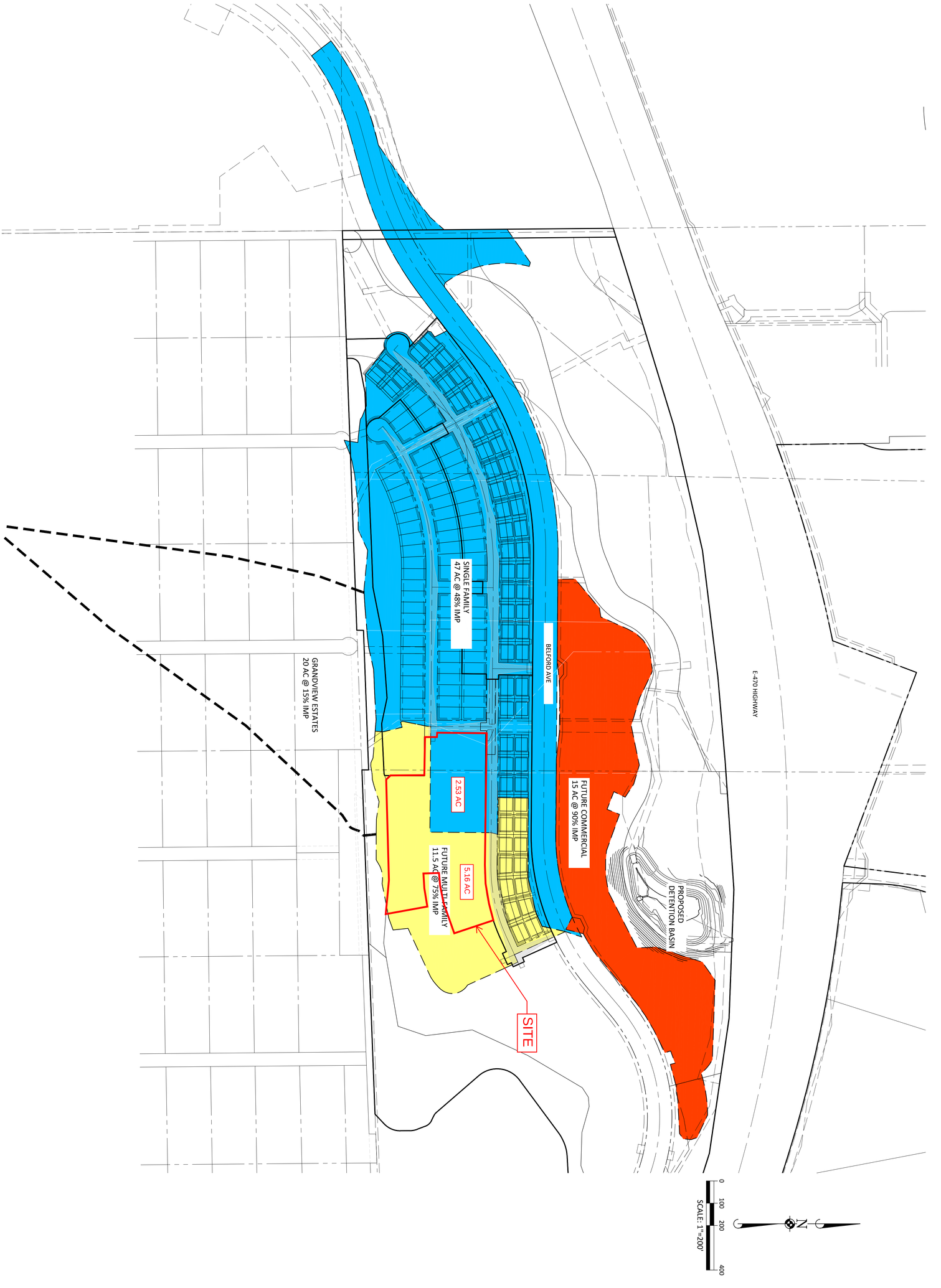
Civil Engineering | Surveying & Geospatial Services | GIS
Water Resource Management | Construction Management

DATE	REVISIONS	DRAWN BY
		ASD
		RAK
07/20/2020	4 REVISED TO ADD OFF-LINE DET BASIN	
12/21/2016	3 REVISED PER TOWN COMMENTS	

PROJ. MGR.: RLB
PROJ. ASSOC.: ASD
DRAWN BY: RAK
DATE: 6-30-16

SHEET 3 OF 3
CLCPKC3



SHEET 1 OF 1
CLCPKC3

DATE: 3.2.20
DRAWN BY: ASD
PROJ. MGR.: JE
PROJ. MGR.: GTI

COMPARK VILLAGE SOUTH FILING NO. 1

TOWN OF PARKER, CO

CONTRIBUTORY DRAINAGE AREAS TO DET BASIN EXHIBIT

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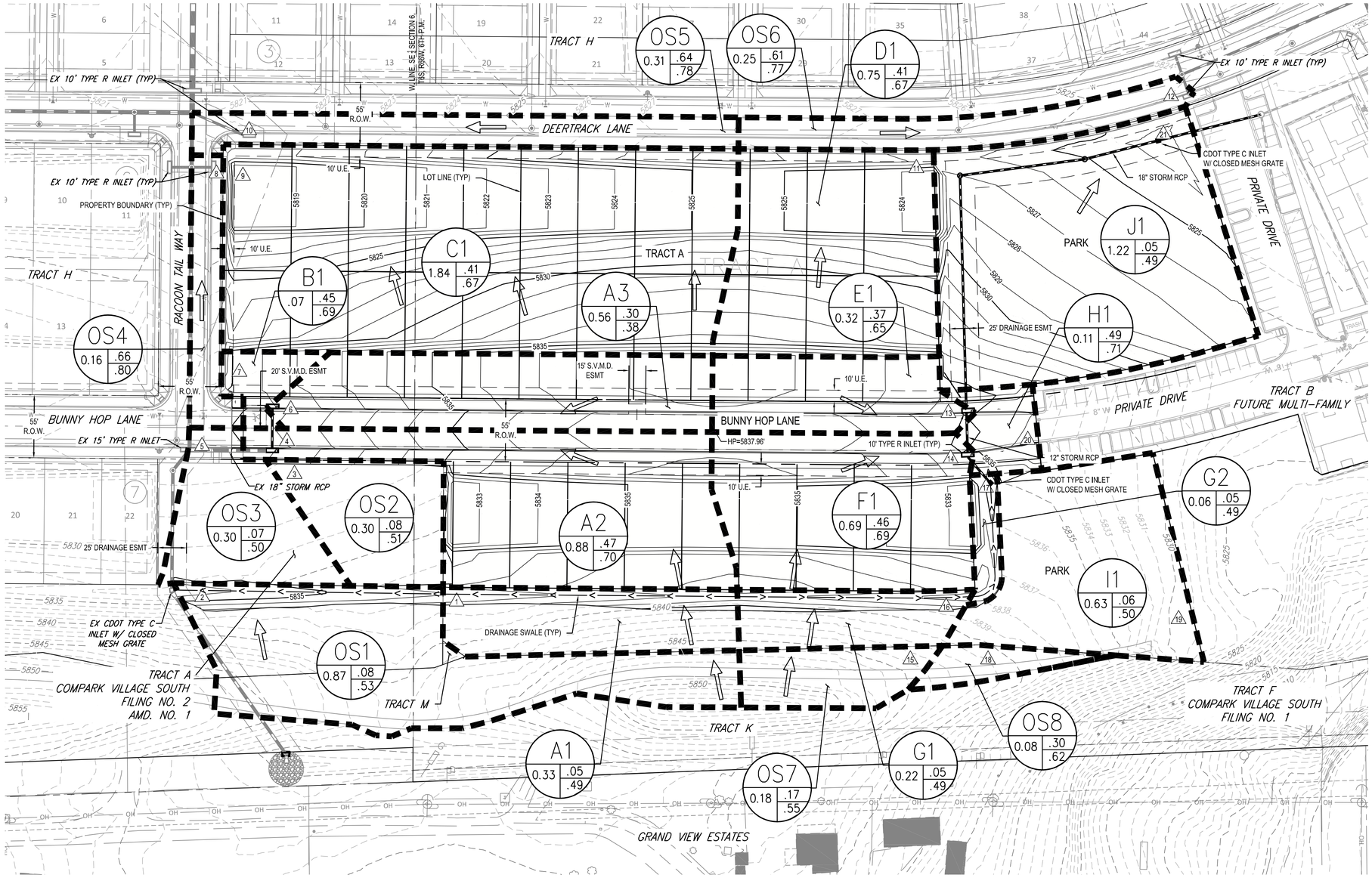
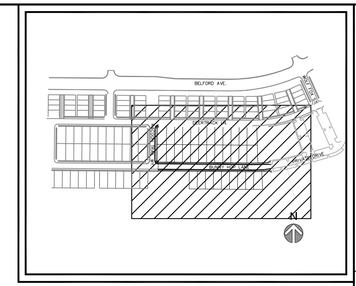
DATE	REVISIONS	DRAWN BY

####





SUMMARY RUNOFF TABLE

Basin	Design Point	Area (ac)	Imp (%)	5-Yr Peak Flow (cfs)	100-Yr Peak Flow (cfs)
A1	1	0.33	2%	0.0	1.2
OS1	2	0.87	11%	0.2	2.7
*CVS 14A	2	4.01	55%	0.2	10.2
ΣA1+OS1+CVS 14A	2	5.21	44%	0.5	14.0
OS2	3	0.30	6%	0.1	0.9
A2	4	0.88	54%	1.0	3.9
ΣA2 + OS2	4	1.17	41%	1.1	4.9
OS3	5	0.30	4%	0.1	1.0
ΣOS2+CO(DP2+DP4)	5	0.30	4%	0.1	3.3
A3	6	0.56	58%	0.6	1.8
B1	7	0.07	51%	0.1	0.4
OS4	8	0.16	77%	0.4	1.2
ΣB1 + OS4	8	0.23	69%	0.5	1.5
C1	9	1.84	46%	2.7	11.1
OS5	10	0.31	73%	0.7	2.1
ΣC1 + OS5	10	2.14	50%	3.4	13.2
D1	11	0.75	46%	1.1	4.5
OS6	12	0.25	71%	0.5	1.7
ΣD1 + OS6	12	1.00	52%	1.6	6.2
E1	14	0.32	41%	0.4	1.7
F1	15	0.69	51%	0.8	3.0
OS7	16	0.18	16%	0.1	0.9
G1	17	0.22	2%	0.0	0.9
ΣG1 + OS7	17	0.40	8%	0.1	1.8
G2	18	0.06	2%	0.0	0.3
ΣG1 + G2 + OS7	18	0.46	8%	0.2	2.1
OS8	19	0.08	32%	0.1	0.5
I1	20	0.63	3%	0.1	2.5
ΣI1 + OS8	20	0.71	6%	0.2	2.9
H1	21	0.11	55%	0.2	0.7
J1	22	1.22	2%	0.2	4.6

*REFER TO CVS F2 REPORT AS REFERENCED IN THIS REPORT
**DP# - REFERS TO CARRYOVER FROM DESIGN POINT #

N

100' 0 50' 100' 200'
1" = 100' HOR.

LEGEND:

- PROPERTY BOUNDARY
- LOT LINE
- 5555 PROPOSED MAJOR CONTOUR
- 5555 PROPOSED MINOR CONTOUR
- 5555 EXISTING MAJOR CONTOUR
- 5555 EXISTING MINOR CONTOUR
- DRAINAGE BASIN BOUNDARY
- 16 DESIGN POINT
- FLOW ARROWS
- STORM SEWER
- DRAINAGE SWALE
- STORM INLET
- STORM MANHOLE
- S EX SANITARY MANHOLE
- ST EX STORM MANHOLE
- SD EX STORM SERVICE
- EX STORM INLET

PROPOSED BASIN:

A-2 0.10 .44 .59
- BASIN IDENTIFICATION
- BASIN C5 VALUE
- BASIN C100 VALUE
- BASIN AREA (ACRES)

Know what's below. Call before you dig.

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 AND 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, PUBLIC WORKS DIRECTOR — DATE

TOWN OF PARKER, PUBLIC WORKS MANAGER - STORMWATER — DATE

TOWN OF PARKER, PUBLIC WORKS MANAGER - TRANSPORTATION — DATE

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CENTURY Living

REV	REVISION DESCRIPTION	DATE	CHND	CHKD	APPR

COMPARK VILLAGE SOUTH
PRIVATE IMPROVEMENT CONSTRUCTION PLANS
DRAINAGE MAP

TITLE

ISSUED FOR REVIEW
FOR AND ON BEHALF OF MERRICK & COMPANY

PE STAMP

JOB NUMBER 65120950
DATE 9/10/2021
SHEET 1 OF 1
1

National Flood Hazard Layer FIRMette

FEMA

104°49'30"W 39°33'23"N

104°48'53"W 39°32'55"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/18/2021 at 4:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

104°50'37.5" 39°33'45" — 0514000mE — 0515000mE — 0516000mE — 104°48'45" 39°33'45"

4379000mN — 4378000mN — 4377000mN — 4376000mN — 1630000 FT — 1625000 FT — 1620000 FT — 3190000 FT

R. 67 W. — R. 66 W.

Douglas County Unincorporated Areas 080049

City of Lone Tree 080319

Town of Parker 080310

JAMES E CASEY AVE — COMPARK BLVD — LIBERTY BLVD — LIBERTY WAY — LYNNFIELD DR — E LINCOLN AVE — E-470

AMERICAN WAY — UPLAND DR — PRAIRIE TRAIL DR — COMPARK CT

S PEORIA ST — N 1ST ST — N 2ND ST — N 3RD ST — N 4TH ST — N 5TH STREET — N 6TH ST

E FILBERT AVE — E ELM AVE — E DOGWOOD AVE — E COTTONWOOD AVE — E BIRCH AVE — E LINCOLN AVE

PARKER RD — MERIDIAN VILLAGE PKWY — GLENAYRE LN — BRISTLERIDGE ST — GLENAYRE CT — GREENFIELD DR — GLENAYRE CIR

URBANA BLVD — FORT WORTH CT — ATLANTA ST — CARACAS AVE — CONCORDIA ST

SEVERN LN — SWANSEA DR — BRADFORD DR

Green Acres Tributary — Happy Canyon Creek — Grandview Tributary — Badger Gulch — Stonegate Tributary

ZONE A — ZONE AE — ZONE AO (DEPTH 3) — ZONE AE (EL 5873)

1%-ANNUAL-CHANCE FLOOD DISCHARGE CONTAINED IN STRUCTURE

LIMIT OF STUDY

Culvert — Bridge — BIKE PATH

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 6 SOUTH, RANGE 66 WEST AND TOWNSHIP 6 SOUTH, RANGE 67 WEST.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A,V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
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GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- E 18.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

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

Base map information shown on this FIRM was provided by the Douglas County GIS Department and the Town of Castle Rock GIS Department. Additional input was provided by the City of Lone Tree and Town of Parker. These data are current as of 2010.

SCALE

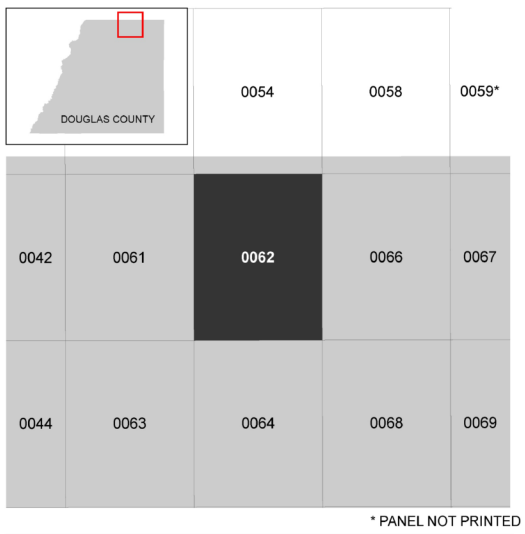
Map Projection:
NAD83 UTM Zone 13N
Western Hemisphere; Vertical Datum: NAVD88

1 inch = 500 feet — 1:6,000

0 — 1,000 — 2,000 Feet

0 — 250 — 500 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

DOUGLAS COUNTY, COLORADO
and Incorporated Areas

PANEL 62 OF 495

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
DOUGLAS COUNTY	080049	0062	H
LONE TREE, CITY OF	080319	0062	H
PARKER, TOWN OF	080310	0062	H

VERSION NUMBER
2.3.3.2

MAP NUMBER
08035C0062H

MAP REVISED
SEPTEMBER 4, 2020

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Castle Rock Area, Colorado

September 21, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,570 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:20,000.

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: Castle Rock Area, Colorado
Survey Area Data: Version 13, Jun 5, 2020

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

Date(s) aerial images were photographed: Oct 3, 2018—Dec 4, 2018

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FoB	Fondis clay loam, 1 to 3 percent slopes	4.0	8.9%
Lo	Loamy alluvial land	0.2	0.4%
NeE	Newlin gravelly sandy loam, 8 to 30 percent slopes	40.7	90.7%
Totals for Area of Interest		**44.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Castle Rock Area, Colorado

FoB—Fondis clay loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: jqyn
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Fondis and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Landform: Buttes, hills, ridges, mesas
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits over sedimentary rock coarse-silty outwash derived from arkose

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: clay
H3 - 24 to 60 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Minor Components

Kutch
Percent of map unit: 7 percent
Hydric soil rating: No

Buick
Percent of map unit: 6 percent
Hydric soil rating: No

Satanta
Percent of map unit: 6 percent
Hydric soil rating: No

Aquic haplustolls
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Lo—Loamy alluvial land

Map Unit Setting
National map unit symbol: jqzb
Elevation: 7,000 to 8,000 feet
Mean annual precipitation: 17 to 19 inches
Mean annual air temperature: 44 to 46 degrees F
Frost-free period: 115 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition
Loamy alluvial land: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loamy Alluvial Land

Setting
Landform: Flood plains, swales
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
H1 - 0 to 20 inches: sandy loam
H2 - 20 to 40 inches: stratified loamy sand to clay loam
H3 - 40 to 60 inches: sand and gravel

Properties and qualities
Slope: 1 to 5 percent
Drainage class: Well drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: FrequentNone
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C
Ecological site: R049XY036CO - Overflow
Hydric soil rating: No

Minor Components

Bresser
Percent of map unit: 7 percent
Hydric soil rating: No

Sampson
Percent of map unit: 7 percent
Hydric soil rating: No

Sandy alluvial land
Percent of map unit: 5 percent

Fluvaquentic haplustolls
Percent of map unit: 1 percent
Landform: Terraces
Hydric soil rating: Yes

NeE—Newlin gravelly sandy loam, 8 to 30 percent slopes

Map Unit Setting
National map unit symbol: jqzg
Elevation: 5,500 to 6,600 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 49 to 51 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition
Newlin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newlin

Setting
Landform: Terraces, mesas, plateaus

Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Unconformable sandy and gravelly and/or mixed source alluvium

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 17 inches: gravelly sandy clay loam
H3 - 17 to 22 inches: gravelly sandy loam
H4 - 22 to 60 inches: very gravelly sand

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R049XB215CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Bresser

Percent of map unit: 5 percent
Hydric soil rating: No

Satanta

Percent of map unit: 4 percent
Hydric soil rating: No

Stapleton

Percent of map unit: 4 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 2 percent
Landform: Swales
Hydric soil rating: Yes

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Appendix B: Hydrologic Computations

Table 6-3. Recommended percentage imperviousness values

Land Use or Surface Characteristics	Percentage Imperviousness (%)
Business:	
Downtown Areas	95
Suburban Areas	75
Residential lots (lot area only)**:**	
Single-family	
2.5 acres or larger	12
0.75 – 2.5 acres	20
0.25 – 0.75 acres	30
0.25 acres or less	45
Apartments	75
Industrial:	
Light areas	80
Heavy areas	90
Parks, cemeteries	10
Playgrounds	25
Schools	55
Railroad yard areas	50
Undeveloped Areas:	
Historic flow analysis	2
Greenbelts, agricultural	2
Off-site flow analysis (when land use not defined)	45
Streets:	
Paved	100
Gravel (packed)	40
Drive and walks	90
Roofs	90
Lawns, sandy soil	2
Lawns, clayey soil	2

MERRICK & COMPANY

Developed Composite C-Factor and Impervious Analysis

Compark Village South - (Tract A)

Calculated by: KB
Checked by: KW
Date: 10/7/2021

UDFCD - TABLE 6-4, SOIL GROUP C/D

Basin	Land Use	Area (acres)	I value	C5	C10	C100
A1	PROPOSED LANDSCAPE	0.33	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.00	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.33	**0.02**	**0.05**	**0.15**	**0.49**
A2	PROPOSED LANDSCAPE	0.08	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.60	0.45	0.40	0.47	0.67
	PROPOSED WALKS	0.03	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.17	1.00	0.86	0.87	0.89
		0.88	**0.54**	**0.47**	**0.53**	**0.70**
A3	PROPOSED LANDSCAPE	0.07	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.29	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.04	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.16	1.00	0.86	0.87	0.89
		0.56	**0.58**	**0.30**	**0.32**	**0.38**
B1	PROPOSED LANDSCAPE	0.00	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.06	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.07	**0.51**	**0.45**	**0.51**	**0.69**
C1	PROPOSED LANDSCAPE	0.00	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	1.79	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.05	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		1.84	**0.46**	**0.41**	**0.47**	**0.67**
D1	PROPOSED LANDSCAPE	0.00	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.74	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.75	**0.46**	**0.41**	**0.47**	**0.67**
E1	PROPOSED LANDSCAPE	0.04	0.02	0.05	0.15	0.49
	PROPOSED PARK	0.16	0.10	0.12	0.21	0.53
	PROPOSED BUILDING AND WALKS	0.02	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.09	1.00	0.86	0.87	0.89
		0.32	**0.41**	**0.37**	**0.43**	**0.65**
F1	PROPOSED LANDSCAPE	0.04	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.53	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.03	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.09	1.00	0.86	0.87	0.89

MERRICK & COMPANY

Developed Composite C-Factor and Impervious Analysis

Compark Village South - (Tract A)

Calculated by: KB
Checked by: KW
Date: 10/7/2021

		UDFCD - TABLE 6-4, SOIL GROUP C/D				
		0.69	**0.51**	**0.46**	**0.51**	**0.69**
G1	PROPOSED LANDSCAPE	0.22	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.00	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.22	**0.02**	**0.05**	**0.15**	**0.49**
G2	PROPOSED LANDSCAPE	0.06	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.00	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.00	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.06	**0.02**	**0.05**	**0.15**	**0.49**
H1	PROPOSED LANDSCAPE	0.05	0.02	0.05	0.15	0.49
	PROPOSED SINGLE FAMILY (0.25 AC or LESS)	0.00	0.45	0.40	0.47	0.67
	PROPOSED BUILDING AND WALKS	0.02	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.05	1.00	0.86	0.87	0.89
		0.11	**0.55**	**0.49**	**0.54**	**0.71**
I1	PROPOSED LANDSCAPE	0.62	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.63	**0.03**	**0.06**	**0.15**	**0.50**
J1	PROPOSED LANDSCAPE	1.22	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.00	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		1.22	**0.02**	**0.05**	**0.15**	**0.49**
OS1	PROPOSED LANDSCAPE	0.78	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.08	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.87	**0.11**	**0.12**	**0.21**	**0.53**
OS2	PROPOSED LANDSCAPE	0.28	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.30	**0.06**	**0.08**	**0.17**	**0.51**
OS3	PROPOSED LANDSCAPE	0.29	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.30	**0.04**	**0.07**	**0.16**	**0.50**
OS4	PROPOSED LANDSCAPE	0.04	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.11	1.00	0.86	0.87	0.89
		0.16	**0.77**	**0.66**	**0.70**	**0.80**
OS5	PROPOSED LANDSCAPE	0.08	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.02	0.90	0.77	0.80	0.85

MERRICK & COMPANY

Developed Composite C-Factor and Impervious Analysis

Compark Village South - (Tract A)

Calculated by: KB
Checked by: KW
Date: 10/7/2021

		UDFCD - TABLE 6-4, SOIL GROUP C/D				
	PROPOSED PAVEMENT	0.21	1.00	0.86	0.87	0.89
		0.31	**0.73**	**0.64**	**0.67**	**0.78**
OS6	PROPOSED LANDSCAPE	0.07	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.01	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.16	1.00	0.86	0.87	0.89
		0.25	**0.71**	**0.61**	**0.65**	**0.77**
OS7	PROPOSED LANDSCAPE	0.15	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.03	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.18	**0.16**	**0.17**	**0.25**	**0.55**
OS8	PROPOSED LANDSCAPE	0.05	0.02	0.05	0.15	0.49
	PROPOSED BUILDING AND WALKS	0.03	0.90	0.77	0.80	0.85
	PROPOSED PAVEMENT	0.00	1.00	0.86	0.87	0.89
		0.08	**0.32**	**0.30**	**0.37**	**0.62**

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STANDARD FORM SF-2
TIME OF CONCENTRATION

10/7/2021

CALCULATED BY: *KB* PROJECT: Compark Village South - (Tract A) JOB NO: 65119686
CHECKED BY: *KW* BASIN: LOCATION: Town of Parker, CO

SUB-BASIN DATA				INITIAL/OVERLAND TIME (Tc)			TRAVEL TIME Gutter (Tt)						Tc CHECK (Urbanized Basins)			FINAL Tc	CONVEYANCE REMARKS
DESIGNATION	AREA (acres)	IMPERVIOUS %	Cs	LENGTH (ft)	SLOPE (%)	Ti (min)	LENGTH (ft)	AVG. SLOPE ΔY	(%)	Conv. Type*	VEL (fps)	Tt (min)	COMP Tc (min)	TOTAL LENGTH (ft)	Tc=(26-17i)+L/(60*(14i+9)*sqrt(S)) (min)	(min)**	
A1	0.33	2%	0.05	40	16.0	4.8	240	2.8	1.2	3	0.8	5.3	10.1	280	26.0	**10.1**	Building Roof
A2	0.88	54%	0.47	120	1.5	10.8	375	5.0	1.3	6	2.3	2.7	13.5	495	17.1	**13.5**	Paved Gutter
A3	0.56	58%	0.30	20	3.2	4.4	375	5.0	1.3	6	2.3	2.7	7.1	395	16.2	**7.1**	Paved Gutter
B1	0.07	51%	0.45	25	1.5	5.1	395	5.0	1.3	6	2.3	2.9	8.1	420	17.6	**8.1**	Paved Gutter
C1	1.84	46%	0.41	25	2.5	4.6	185	10.5	5.7	6	4.8	0.6	5.2	210	18.2	**5.2**	Paved Gutter
D1	0.75	46%	0.41	25	2.5	4.6	185	10.5	5.7	6	4.8	0.6	5.2	210	18.3	**5.2**	Paved Gutter
E1	0.32	41%	0.37	25	1.5	5.8	175	1.0	0.6	6	1.5	1.9	7.7	200	19.3	**7.7**	Paved Gutter
F1	0.69	51%	0.46	120	1.5	11.1	350	5.0	1.4	6	2.4	2.4	13.6	470	17.5	**13.6**	Paved Gutter
G1	0.22	2%	0.05	40	16.0	4.8	200	2.8	1.4	5	1.8	1.9	6.7	240	25.9	**6.7**	Grass Swale
G2	0.06	2%	0.05	15	20.0	2.7	100	1.5	1.5	5	1.8	0.9	3.6	115	25.8	**5.0**	Grass Swale
H1	0.11	55%	0.49	18	1.5	4.1	50	1.3	2.6	6	3.2	0.3	4.4	68	16.7	**5.0**	Paved Gutter
I1	0.63	3%	0.06	25	4.0	5.9	140	6.0	4.3	3	1.4	1.6	7.6	165	25.6	**7.6**	Pasture
J1	1.22	2%	0.05	25	4.0	6.0	220	10.0	4.5	3	1.5	2.5	8.4	245	25.8	**8.4**	Pasture
OS1	0.87	11%	0.12	100	3.6	11.6	215	2.5	1.2	3	0.8	4.7	16.3	315	24.5	**16.3**	Pasture
OS2	0.30	6%	0.08	100	3.5	12.2	130	3.4	2.6	3	1.1	1.9	14.1	230	25.3	**14.1**	Pasture
OS3	0.30	4%	0.07	100	3.5	12.3	25	0.5	2.0	3	1.0	0.4	12.7	125	25.6	**12.7**	Pasture
OS4	0.16	77%	0.66	15	1.5	2.7	200	7.5	3.8	6	3.9	0.9	3.5	215	13.1	**5.0**	Paved Gutter
OS5	0.31	73%	0.64	15	1.5	2.8	415	7.0	1.7	6	2.6	2.7	5.5	430	13.7	**5.5**	Paved Gutter
OS6	0.25	71%	0.61	15	1.5	3.0	300	3.0	1.0	6	2.0	2.5	5.5	315	14.1	**5.5**	Paved Gutter
OS7	0.18	16%	0.17	20	16.0	3.0	25	4.0	16.0	3	2.8	0.1	3.2	45	23.3	**5.0**	Pasture
OS8	0.08	32%	0.30	15	10.0	2.6	20	2.0	10.0	3	2.2	0.2	2.8	35	20.5	**5.0**	Pasture

* Note: Conveyance Coefficients - Type 1-Heavy Meadow, Type 2-Tillage/Field, Type 3-Short Pasture and lawns, Type 4-Nearly Bare Soil, Type 5-Grassed Waterway, Type 6-Paved areas and shallow paved swales. The maximum initial/overland length shall not exceed 300 feet.

** Based on Assumption that Building roofs will take 5 min to fully contribute to storm system

MERRICK & COMPANY

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

CALCULATED BY: KB
DATE: 10/7/2021
CHECKED BY: KW

JOB NO: 65110570
PROJECT: Compark Village South - (Tract A)
DESIGN STORM: 5 Year

		DIRECT RUNOFF						TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME		
DESIGN POINT	AREA DESIG.	AREA (Acres)	RUNOFF COEFF	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	Tc (min)	(C A) (Acres)	I (in/hour)	Q (cfs)	SLOPE (%)	STREET FLOW (cfs)	DESIGN FLOW (cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	Tt (min)
	A1	0.33	0.05	10.1	0.02	2.9	0.05												
	A2	0.88	0.47	13.5	0.42	2.5	1.05												
	A3	0.56	0.30	7.1	0.17	3.2	0.56												
	B1	0.07	0.45	8.1	0.03	3.1	0.09												
	C1	1.84	0.41	5.2	0.76	3.6	2.70												
	D1	0.75	0.41	5.2	0.31	3.5	1.09												
	E1	0.32	0.37	7.7	0.12	3.2	0.37												
	F1	0.69	0.46	13.6	0.31	2.5	0.79												
	G1	0.22	0.05	6.7	0.01	3.3	0.04												
	G2	0.06	0.05	5.0	0.00	3.6	0.01												
	H1	0.11	0.49	5.0	0.05	3.6	0.20												
	I1	0.63	0.06	7.6	0.04	3.2	0.12												
	J1	1.22	0.05	8.4	0.06	3.1	0.19												
	OS1	0.87	0.12	16.3	0.11	2.3	0.24												
	OS2	0.30	0.08	14.1	0.02	2.5	0.06												
	OS3	0.30	0.07	12.7	0.02	2.6	0.05												
	OS4	0.16	0.66	5.0	0.11	3.6	0.38												
	OS5	0.31	0.64	5.5	0.20	3.5	0.68												
	OS6	0.25	0.61	5.5	0.15	3.5	0.54												
	OS7	0.18	0.17	5.0	0.03	3.6	0.11												
	OS8	0.08	0.30	5.0	0.02	3.6	0.09												

5-YEAR RAINFALL = 1.39 IN/HR., 100-YEAR RAINFALL = 2.60 IN/HR.
*value known from Master Drainage Report

MERRICK & COMPANY

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

CALCULATED BY: KB
DATE: 10/7/2021
CHECKED BY: KW
JOB NO: 65110570
PROJECT: Compark Village South - (Tract A)
DESIGN STORM: 100 Year

		DIRECT RUNOFF						TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME		
DESIGN POINT	AREA DESIG.	AREA (Acres)	RUNOFF COEFF	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	Tc (min)	(C A) (Acres)	I (in/hour)	Q (cfs)	SLOPE (%)	STREET FLOW (cfs)	DESIGN FLOW (cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	Tt (min)
	A1	0.33	0.49	10.1	0.16	7.2	1.18												
	A2	0.88	0.70	13.5	0.62	6.4	3.92												
	A3	0.56	0.38	6.2	0.21	8.5	1.81												
	B1	0.07	0.69	8.1	0.05	7.8	0.36												
	C1	1.84	0.67	5.2	1.24	9.0	11.07												
	D1	0.75	0.67	5.2	0.50	8.9	4.50												
	E1	0.32	0.65	7.7	0.21	7.9	1.66												
	F1	0.69	0.69	13.6	0.48	6.3	3.04												
	G1	0.22	0.49	6.7	0.11	8.3	0.91												
	G2	0.06	0.49	5.0	0.03	9.1	0.27												
	H1	0.11	0.71	5.0	0.08	9.1	0.72												
	I1	0.63	0.50	7.6	0.31	8.0	2.49												
	J1	1.22	0.49	8.4	0.60	7.7	4.62												
	OS1	0.87	0.53	16.3	0.46	5.8	2.66												
	OS2	0.30	0.51	14.1	0.15	6.2	0.94												
	OS3	0.30	0.50	12.7	0.15	6.5	0.97												
	OS4	0.16	0.80	5.0	0.13	9.1	1.16												
	OS5	0.31	0.78	5.5	0.24	8.8	2.12												
	OS6	0.25	0.77	5.5	0.19	8.8	1.71												
	OS7	0.18	0.55	5.0	0.10	9.1	0.91												
	OS8	0.08	0.62	5.0	0.05	9.1	0.45												

5-YEAR RAINFALL = 1.39 IN/HR., 100-YEAR RAINFALL = 2.60 IN/HR.
*value known from Master Drainage Report

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Appendix C: Hydraulic Computations

(As of the date of this report, the analysis is still in progress and will be added with the next submittal)

Inlet Sizing
UD-Inlet Calculations

StormCAD Analysis Output

Appendix D: Stormwater Quality Information and Details

Appendix E: Excerpts from Referenced Drainage Studies