

## **ITEM # 2.1**

### **PRELIMINARY & FINAL PLAT APPROVAL:**

Crystal Estates Subdivision IV  
Being a 14.71-acre parcel of land, out of Lot 27-1,  
West Addition to Sharyland  
R-2  
Developer: DG & GG Investments, LLC  
Engineer: Ever Engineering, LLC

### **REVIEW DATA**

#### **PLAT DATA**

The proposed subdivision is located east of Inspiration Rd. approximately 1,400' south of W. 2 Mile Road. – see vicinity map. The developer is proposing forty-seven (47) Duplex - Fourplex lots. - see plat for actual dimensions, square footages, and land uses.

#### **WATER**

The developer shall connect to an existing 12" water line located along the west side of Inspiration Rd. and extend into the subdivision. The water line will be a main 8" looped line providing water service for each lot. There are 2 proposed fire hydrants via direction of the Fire Marshal's office. – see utility plan

#### **SEWER**

Sanitary sewer service for this subdivision will tie into a proposed manhole located within the Inspiration Rd. ROW. The sewer line will extend into the subdivision collect from each lot through a 6" stub out into the proposed 8" sewer main line. The Capital Sewer Recovery Fee is required at \$670.00/Lot which equates to \$31,490.00 (\$670.00 x 47 Lots).

#### **STREETS & STORM DRAINAGE**

The proposed internal street is a 32' back-to-back within a 50' Right of Way. Access will be from Inspiration Rd. Proposed runoff after development is 25.56 cfs during the 50-yr storm frequency. Drainage shall consist of surface runoff from the lots into the proposed streets and collected by type "A" inlets. Pipe size diameter will be 24". The proposed storm system shall discharge into a proposed detention pond on the south side of the site which will then discharge into an existing City of Mission storm system network, located on the southwest corner of the site and on the west ROW of Trosper Rd. The City Engineer has reviewed and approved the drainage report.

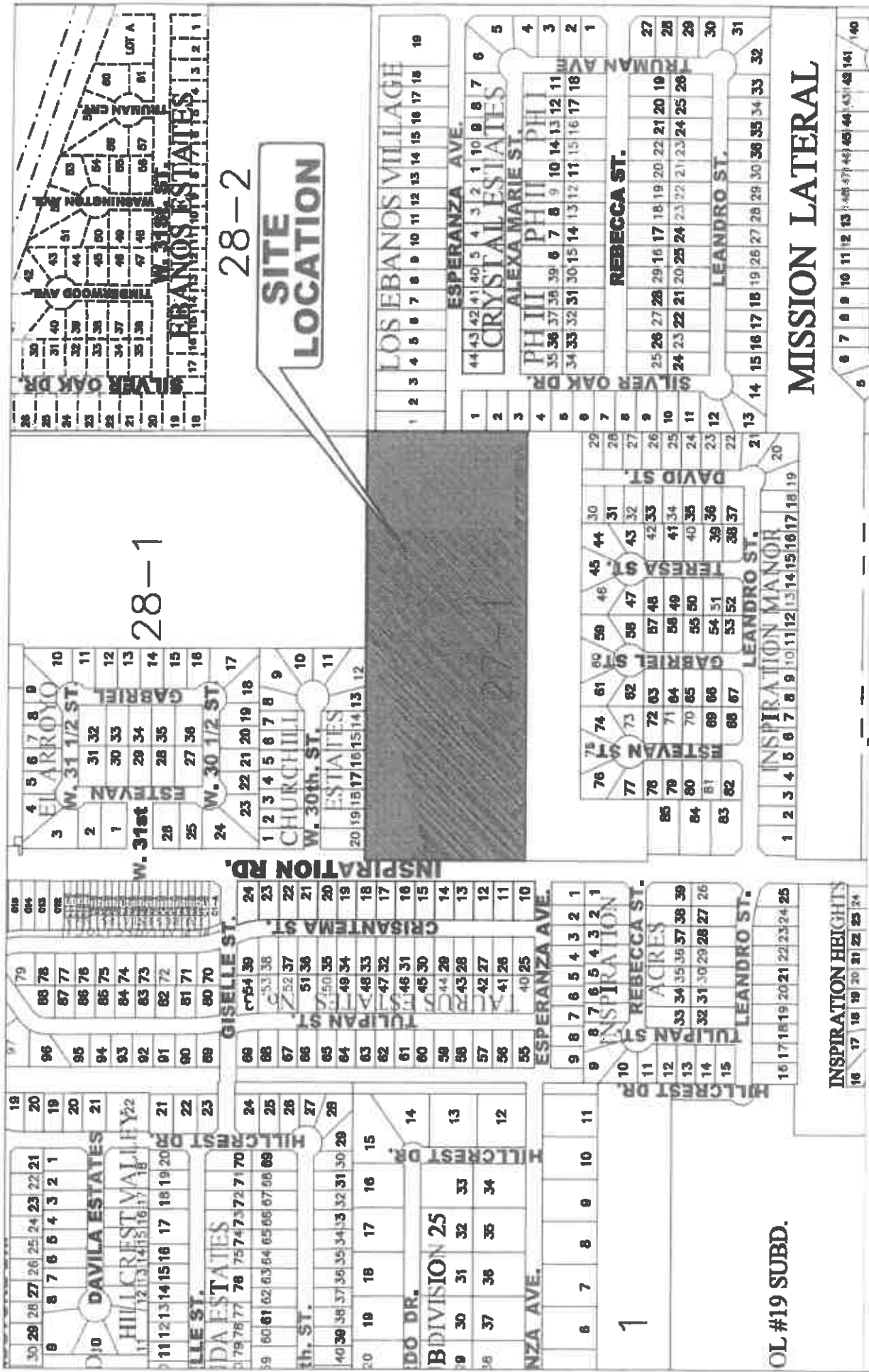
#### **OTHER COMMENTS**

Installation of street lighting as per City Standards  
Payment of Park Fees in the amount of \$94,000 (\$500.00 x 188 HUE).  
Water District Exclusion  
Must comply with all other format findings.

#### **RECOMMENDATION**

Staff recommends approval subject to:

1. Payment of Capital Sewer Recovery Fees
2. Payment of Park Fees
3. Water District Exclusion
4. Compliance with all other format findings



**SITE LOCATION**

28-1

28-2

OL #19 SUBD.

**MISSION LATERAL**



**CITY OF MISSION**  
 HIDALGO COUNTY, TEXAS  
 1201 N. Hill, Suite  
 Mission, TX 75702  
 TEL: (254) 380-8872  
 FAX: (254) 380-8890

No.



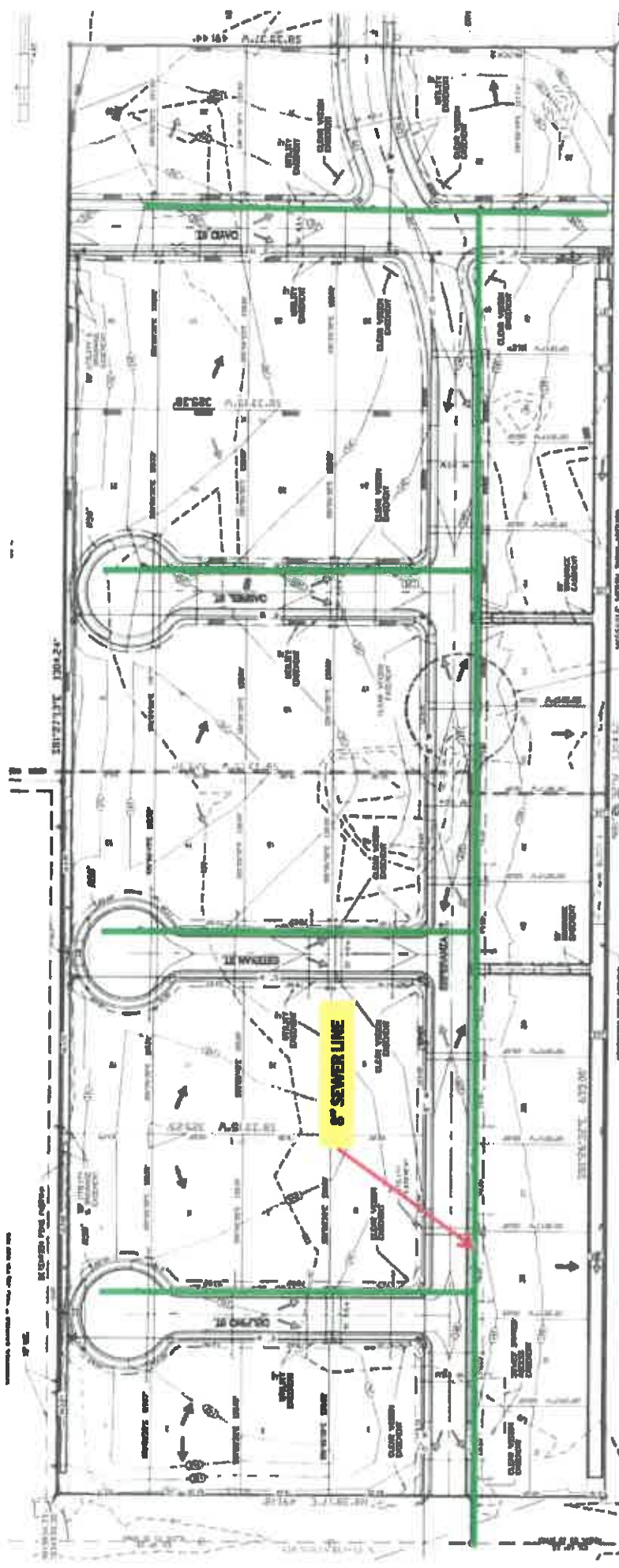
**SITE  
LOCATION**

**INSPIRATION RD.**

**ESPERANZA ST.**







PHASE I CONSTRUCTION

STATION	START	END	LENGTH
1+00	1+00	1+05	5
1+05	1+05	1+10	5
1+10	1+10	1+15	5
1+15	1+15	1+20	5
1+20	1+20	1+25	5
1+25	1+25	1+30	5
1+30	1+30	1+35	5
1+35	1+35	1+40	5
1+40	1+40	1+45	5
1+45	1+45	1+50	5
1+50	1+50	1+55	5
1+55	1+55	1+60	5
1+60	1+60	1+65	5
1+65	1+65	1+70	5
1+70	1+70	1+75	5
1+75	1+75	1+80	5
1+80	1+80	1+85	5
1+85	1+85	1+90	5
1+90	1+90	1+95	5
1+95	1+95	2+00	5

PHASE II CONSTRUCTION

STATION	START	END	LENGTH
2+00	2+00	2+05	5
2+05	2+05	2+10	5
2+10	2+10	2+15	5
2+15	2+15	2+20	5
2+20	2+20	2+25	5
2+25	2+25	2+30	5
2+30	2+30	2+35	5
2+35	2+35	2+40	5
2+40	2+40	2+45	5
2+45	2+45	2+50	5
2+50	2+50	2+55	5
2+55	2+55	2+60	5
2+60	2+60	2+65	5
2+65	2+65	2+70	5
2+70	2+70	2+75	5
2+75	2+75	2+80	5
2+80	2+80	2+85	5
2+85	2+85	2+90	5
2+90	2+90	2+95	5
2+95	2+95	3+00	5

PHASE I CONSTRUCTION

PHASE II CONSTRUCTION

REPLAT

INTO

GENERAL NOTES: THIS PLAN SHOWS THE LOCATION OF THE SEWER LINE AND THE LOCATION OF THE MANHOLE AND THE LOCATION OF THE PUBLIC STREET AND PAVED

THE CITY OF DENVER HAS THE HONOR OF THE CONTRACT FOR THE CONSTRUCTION OF THE SEWER LINE AND THE LOCATION OF THE MANHOLE AND THE LOCATION OF THE PUBLIC STREET AND PAVED

THE CITY OF DENVER HAS THE HONOR OF THE CONTRACT FOR THE CONSTRUCTION OF THE SEWER LINE AND THE LOCATION OF THE MANHOLE AND THE LOCATION OF THE PUBLIC STREET AND PAVED

THE CITY OF DENVER HAS THE HONOR OF THE CONTRACT FOR THE CONSTRUCTION OF THE SEWER LINE AND THE LOCATION OF THE MANHOLE AND THE LOCATION OF THE PUBLIC STREET AND PAVED

THE CITY OF DENVER HAS THE HONOR OF THE CONTRACT FOR THE CONSTRUCTION OF THE SEWER LINE AND THE LOCATION OF THE MANHOLE AND THE LOCATION OF THE PUBLIC STREET AND PAVED

THE CITY OF DENVER HAS THE HONOR OF THE CONTRACT FOR THE CONSTRUCTION OF THE SEWER LINE AND THE LOCATION OF THE MANHOLE AND THE LOCATION OF THE PUBLIC STREET AND PAVED

## **Crystal Estates IV Stormwater Management Plan**

### **SITE DESCRIPTION**

The Crystal Estates IV site is currently undeveloped and located in Hidalgo County, within the limits of The City of Mission. The property is currently undeveloped and contains negligible existing impervious cover. The property can generally be described as open grassy area along with scattered trees. On-site natural ground slopes were found to be in the 0.5%-2% range. The proposed property is located approximately 1,400' south of the W 2 Mile Road and Inspiration Road intersection as shown on the attached location map (EXH 1). The 14.713-acre tract is bound by single-family residential development and undeveloped land with approximately 500ft of frontage along Inspiration Road.

The soils in this area are mostly fine sandy loam (25) with some sandy clay loam (28), these soils belong to hydrologic group B, which have a moderate infiltration rate when saturated. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission, (reference Exhibit 9).

### **PROPOSED PROJECT**

The proposed project consists of eighteen (47) lots developed for multi-family use including dedicated right-of-way access and a lot dedicated for a proposed detention pond. It will be assumed that the entire site will be used as multi-family development for drainage calculations purposes. This report studies the onsite and offsite basins for the proposed property. This report will show that flows leaving the site for developed-conditions will be less than existing-condition flows with the aid of two proposed detention ponds (see Appendix C).

### **METHODOLOGY**

This report will examine the change in runoff due to the development by utilizing the Rational and Modified Rational methods ( $Q=CIA$ ). Times of concentration were determined through the TR-55 method for small, urban watersheds using the 2-year 24-hour period return and Manning's roughness coefficients from table 3-1. Watersheds were assigned a C-value based on the typical ranges for the land use types provided in Table 3-3 of the "City of McAllen Standard Design Guide for Public Infrastructure Improvements". IDF curves were determined using precipitation frequencies, volumes, and intensities as reflected in NOAA Atlas 14, Volume 11 (A14) for "Mission, Texas". This report models the storm runoff rates for the 10-year and 50-year rainfall events for existing and developed conditions. Runoff leaving the site will be less than or equal to the 10-year existing runoff rate for the 50-year developed condition with the aid of the proposed detention pond.

**Crystal Estates IV  
Stormwater Management Plan**

**EXISTING DRAINAGE PATTERNS**

The site does not contain significant, existing impervious cover and generally drains in one direction, from north to south. A single watershed was defined to model the existing drainage patterns including onsite and offsite drainage. Watershed 1 (WS-1) is 20.10-acres and contains onsite and offsite area. Watershed 1 (WS-1) generally drains from north south onto our property and leaves across the southern property line of the site, as shown on (EXH 5) "Existing Conditions Map". Runoff leaving the site discharges directly to the adjacent undeveloped and single-family residential lots at a rate of 21.37 cfs for the 10-year rainfall event. The existing watershed consist of single-family residential (C=0.50) and undeveloped land (C=0.15). A composite C-value of 0.19 was calculated to represent the entire watershed. The Watersheds boundary, time of concentration paths, and flow directions can be found on (EXH 5) "Existing Conditions Drainage Map". Detailed hydrologic calculations can be found in Appendix B. Below is a summary of the existing conditions calculations.

Watershed	Area (ac)	C (unitless)	Tc (min)	Flow (cfs)	
				10	50
<b>EXISTING</b>					
WS-1	20.10	0.19	19	21.37	

**DEVELOPED DRAINAGE PATTERNS**

Watershed 1 (WS-1) will be split into thirteen (12) watersheds, WS-(1-12) to model onsite and offsite storm runoff for developed conditions. All Watershed information can be found on (EXH 6) "Developed Conditions Drainage Map", detailed calculations can be found in Appendix B. Drainage patterns will generally remain the same for developed conditions. Time of concentration paths will increase due to the nature of the development and associated grading. The developed watersheds consist of single-family residential (C=0.50), multi-family "attached" (0.65), and undeveloped land (C=0.15). Composite C-values were assigned where applicable. Flow rates will increase slightly due to the increase in impervious cover for this development. However, Detention Ponds North & South will mitigate the increase in flow rates and reduce the flows leaving the site below existing conditions.

WS (1, 3, 4, & 7) consist of onsite and offsite drainage areas. The watersheds will leave the site un-detained due to the nature of the development. Although the watersheds will see an increase in runoff from the 50-year developed to the 10-year existing runoff conditions, the detention pond will be "over-sized" to mitigate this increase and ultimately decrease the runoff leaving the property as a whole.

WS 2 consists of onsite and offsite drainage areas and will be routed to the proposed Detention Pond North via proposed grading.

**Crystal Estates IV  
Stormwater Management Plan**

WS 6 & (8-12) consist entirely of onsite drainage areas and will be routed to the proposed Detention Pond South via curb & gutter and/or drainage channels. The watersheds were calculated at study points and cross-sections throughout the development to adequately design proposed drainage infrastructure. WS 6 & 8 were calculated at study point 1 (SP-1) to model the runoff within the proposed Delfino Street while watersheds 9, 11, & 12 were calculated to model the runoff within the proposed Estevan, Gabriel, and David Streets respectively. Study points (SP 2, 3, & 4) were calculated to adequately size the drainage channels used to convey runoff from the watersheds to the proposed detention pond. Additionally, the onsite watersheds were combined to design the proposed detention pond and will leave the pond at three different locations along the adjacent property line to mitigate the impact to the properties immediately downstream. Detailed calculations for the combined watershed including calculations for the combined watershed thru pond 1 can be found in Appendices B & C of this report. Below is a summary of the existing conditions calculations.

Watershed	Area	C	Tc	Flow (cfs)	
	(ac)	(unitless)	(min)	10	50
<b>DEVELOPED</b>					
WS-1	0.25	0.65	17		1.31
WS-2	5.05	0.33	25		11.01
WS-3	1.97	0.25	25		3.25
WS-4	3.23	0.54	30		10.41
WS-5	0.77	0.65	19		3.86
WS-6	0.66	0.65	20		4.90
WS-7	0.28	0.65	14		1.48
WS-8	1.83	0.65	20		8.84
WS-9	0.96	0.65	20		4.84
WS-10	1.84	0.65	20		8.89
WS-11	0.72	0.65	17		3.77
WS-12	2.31	0.65	21		10.88
SP-1			20		7.94
SP-2 ("A-A")			20		21.42
SP-3 ("B-B")			20		12.00
SP-4 ("C-C")			21		10.88
POND WS COMB.			20		50.73
POND SOUTH			25		7.46
POND NORTH					5.28
<b>TOTAL DEV. RUNOFF</b>					<b>18.78</b>

**Total runoff rate leaving the site w/o detention, (50-year developed conditions) = 50.73 cfs**

**Total runoff rate leaving the site w/ detention, (50-year developed conditions) = 18.78 cfs**

**Crystal Estates IV  
Stormwater Management Plan**

**DETENTION POND CHARACTERISTICS**

Detention Pond South is a dry, earthen detention pond with modular block walls and a minimum of 0.5% sloped concrete pilot channel bottom. Flow from the combined Pond WS is conveyed to the pond. The pond bottom has a minimum elevation of 131.00 ft with a top of bank set at elevation 138.00 ft. Stage storage tables for Det. Pond South are provided on the Detention Pond Plan, Sheet C9.00, in Appendix C. The pond will utilize a single 12" orifice outfall structure located at the western end of the pond that will discharge directly into a City of Mission public storm sewer located on the west side of Inspiration Road.

Detention Pond North is a dry, earthen detention pond with modular block walls and a minimum of 0.3% sloped concrete pilot channel bottom. Flow from the WS 2 is conveyed to the pond. The pond bottom has a minimum elevation of 136.00 ft with a top of bank set at elevation 139.00 ft. Stage storage tables for Det. Pond North are provided on the Detention Pond Plan, Sheet C9.01, in Appendix C. The pond will utilize a single 12" orifice outfall structure located at the western end of the pond that will discharge directly into a City of Mission public storm Inlet (A-50) located on the east side of Inspiration Road.

The ponds are required to provide enough volume to detain the difference in the 10-year existing and 50-year developed runoff rates which is equivalent to **29.36 cfs (40,130 cf storage)**. The proposed ponds provide approximately **77,456 cf** of storage volume and a discharge rate of **12.47 cfs** combined to further mitigate flows that are allowed to leave the property un-detained. Detailed calculations for flow rates at each outfall structure can be found in the Pond Report within Appendix C. The proposed detention ponds are sized to mitigate the increase in runoff for its contributing watershed in addition to onsite watersheds not conveyed to the pond. All calculations including hydrographs for flows leaving the pond can be found in Appendix C.

**FLOODPLAIN**

The proposed property is not located within any FEMA 100-year effective floodplain zone. However, the City of Mission requires that all development within the FEMA Estimated Base Flood Elevation (estBFE) maps be designed so that no habitable structures are below the estimated base flood elevations. According to the FEMA BFE Map (EXH 10) of the property, all structures on site shall have a finished floor elevation greater than 141.20 ft.

**CONCLUSIONS**

The 10-year existing conditions runoff rate is **21.37 cfs**, and the 50-year developed conditions runoff rate is **50.73 cfs** for the contributing watershed. However, the development will utilize two proposed detention ponds to mitigate the increase in runoff for the 50-year developed conditions to below the 10-year existing conditions, **(18.78 cfs)**. In general, the proposed development will add impervious cover to the site an increase flows. However, flow rates for runoff leaving the site

**Crystal Estates IV  
Stormwater Management Plan**

will be less than existing conditions due to the proposed Detention Ponds. Therefore, the runoff resulting from the proposed development will not produce a significant adverse impact to other properties, habitable structures, or drainage infrastructure systems downstream.

