

COFFEY ENGINEERING, INC.

Drainage Study Villa Montana

13995 Mira Montana Drive San Diego, CA 92014

> APN 300-305-21-00 PTS 653845

> > Prepared for:

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And

The City of San Diego



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- Table A- Pre-Construction-Offsite Flow Conditions
- 100-year Storm Drain Calculations.

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- Figure A-1– Intensity-Duration Design Chart
- Table A-1 Runoff Coefficients for Rational Method

1. Existing Conditions

In existing conditions, the project site is a vacant lot with dispersed vegetation and natural hillsides. The site is composed of two drainage basins (Basins 'X', 'Y'). Storm water generated from Basin 'X' sheet flows across the site in westerly direction into the property vegetated hillside area and off-site towards Parcel 3 of PM 11427. Basin 'X' was calculated to generate approximately Q(100)= 0.22 CFS of storm water runoff. Storm water generated from Basin 'Y' sheet flows in the westerly direction into the property vegetated hillside area and off-site towards Parcel 4 of PM 11427. Basin 'Y' was calculated to generate approximately Q(100)= 0.21 CFS of storm water runoff.

The total amount of storm water discharging from the project site is Q(100)=0.43 CFS.

See Drainage Map 'X.1' in Appendix A for a map of the existing conditions.

2. Proposed Project

In post-construction conditions, the site will contain parcel with a single-family residence with new hardscape and landscape features. The proposed site is composed of two drainage basins (Basin 'A'and 'B').

Basin 'A' is at the west side of the property and includes decks and roof overhangs, pool, pool deck and sidewalks. Storm water generated from Basin 'A' is conveyed to a bio-filtration area for storm water treatment. The bio-filtration overflow structure discharges to a sump-pump that discharges through D-25 curb outlet on Mira Montana. Basin 'A' is calculated to generate approximately Q (100) = 0.69 CFS of storm water.

Basin 'B' is composed of a pervious portion of the project site at west. Storm water generated from Basin 'B' will maintain its natural watercourse and sheet flow off-site to the west property line. Basin 'B' is calculated to generate approximately Q(100) = 0.16 CFS of storm water.

See Drainage Map 'A.1' in Appendix A for a map of the proposed conditions.

3. Purpose and Scope of Report

This report will evaluate the existing and proposed drainage patterns and flow rate characteristics to compare pre-construction and post-construction conditions and address the adequacy of the down-stream system and demonstrate that no adverse impacts will occur to existing street drainage system.

4. Method of Calculations

The Rational Method, as defined by *City of San Diego Drainage Design Manual 2017*, will be used to calculate storm water flow rates. Where noted, the following calculations were used to determine flow properties:

 $\frac{\text{Rainfall Characteristics}}{Q = C * I * A, \text{ where}}$

 $Q = Flow rate (ft^3/sec)$ C = Runoff coefficient(Runoff coefficient per *City of San Diego Drainage Design Manual 2017* reproduced in Appendix C. Soil type D determined from the *Soil Hydrologic Groups* map from the County of San Diego Hydrology Manual reproduced in Appendix C also.) I = Rainfall intensity (in/hr.) per Figure A.1 in Appendix C A = Area (acres)

5. Results and Conclusions:

Based on the calculated post-construction drainage conditions, overall there is an expected Q (100) =0.99 CFS of storm water runoff to due to development of the site. The calculated total 100-yr storm water runoff to the street from Basin 'A' is Q (100) =0.69 CFS. Due to proposed development, the existing bluff of the site located at basin 'Y' will experience a decrease in contributed storm water runoff from the site. Currently, a calculated Q (100) =0.21 CFS of storm water runoff discharges into off-site towards Parcel 4 of PM 11427. In proposed conditions, a calculated Q (100) =0.16 CFS from basin 'B' will sheet-flow from the west hillside areas towards Parcel 4 reducing 0.05 CFS the existing sheet-flow.

Flows to downstream at north are expected to increase from pre-existing condition flow of Q(100)= 0.22 cfs from basin 'X' to the post-construction flow of Q(100)= 0.69 cfs a net increase of 0.47 CFS in flow. It is expected that these flows will contribute to an increased amount of runoff collected by the existing 24"-RCP storm drain located at the intersection of Lozana Rd and Mango Dr. This increase is not expected to adversely affect downstream drainage conditions. The existing 24" RCP @ 1% CFS currently collects 18.34 CFS. The proposed site will increase an estimated 0.47 CFS during a 100-yr. storm event, It is expected that the existing 24" RCP @ 1% adequate to handle 18.81 CFS, because this pipe has a capacity of 22.62 cfs. Refer to Table A-Pre-construction offsite flow conditions, Offsite-24" RCP downstream Basin, Existing and Proposed downstream flows Map and 100 year storm drain calculations.

| | TO | | | | | | | |
|-------------------|--------|---------|--------|---------|--------|---------|--------|--------|
| | PARCEL | | | | то | | | |
| | 3&4 | | | | STREET | | | |
| | A(Ac) | C-coef. | Q(cfs) | V (fps) | A(Ac) | C-coef. | Q(cfs) | V(fps) |
| Pre- construction | 0.30 | 0.32 | 0.43 | 0.28 | 0.00 | 0.32 | 0.00 | 0.00 |
| Post-construction | 0.11 | 0.32 | 0.16 | 0.26 | 0.19 | 0.84 | 0.69 | 2.64 |

| Downstrea | Pipe | | | |
|-------------------|-------------|--------------|------|------|
| | Q(100)(cfs) | V(100) (fps) | d | d/D |
| Pre- construction | 18.34 | 8.02 | 1.37 | 0.68 |
| Post-conditions | 18.81 | 8.05 | 1.39 | 0.70 |

6. Clean Water Act (CWA) Compliance

The proposed project is exempt from permitting under Federal Clean Water Act section 401 or 404 because it does not directly discharge into navigable waters of the United States.

7. Declaration of Responsible Charge

I hereby declare that I am the Civil Engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current design.

I understand that the check of project drawings and specifications by the City of San Diego is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

Kim

Michael C. Kinnear RCE 76785 Exp. 12-31-22

07/16/2021

Date



| Downstrea | Pipe | | | |
|-------------------|-------------|--------------|------|------|
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Michael C. Kinnear RCE 76785 Exp. 12-31-22 Date



Appendix A – Reference Plans Drainage Maps

Appendix B – Calculation/Evaluations

Appendix C – Reference Tables & Figures (City of San Diego Drainage Manual 2017)