Appendix G:
Hydrology and Water Quality Supporting Information

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G.1 - Storm Drain Conveyance Study

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March 28, 2018

Gil Falcone
North Coast Regional Water Quality Control Board
5550 Skylane Blvd. Suite A
Santa Rosa, CA 95403-1072

SUBJECT: DESCRIPTION OF STORMWATER CONVEYANCE STUDY SANDHOLM LN. AND FOOTHILL BLVD., CLOVERDALE CA

Dear Mr. Falcone:

This letter is intended to describe our work in conducting the stormwater conveyance study located at Sandholm Lane and Foothill Boulevard in Cloverdale, CA. We performed a site investigation on March 19, 2018 consisting of visual observations of surface level drainage conveyances and verification of underground drainage infrastructure. This letter will describe the approach and findings of each.

Visual Observations

Prior to the date of our site investigation, there had been seven consecutive days of recorded rainfall with daily accumulated amounts ranging from 0.01 inches to 0.84 inches. There was no rainfall recorded on the day of our observations. Please reference the attached Stormwater Conveyance Exhibit accompanying this letter for further clarity. Starting at a point furthest downstream of our study, we observed positive flow within the Unnamed Drainage to Icaria Creek (tributary; See Point A on Exhibit and approximate flow amounts noted). Then traversing upstream along the flow path, ponding was observed at the rip rap area where the Sandholm Lane pipe conveyances discharge (Point B). We inspected the length of the Roadside Ditch and observed no positive flow within the ditch (representative Point C). Ponded water was observed in the manholes and pipes located in Sandholm northeast of the rip rap discharge area (Points D and E). Ponded water was also observed in the manholes and pipes located in Sandholm 200 feet southwest of the rip rap discharge area (Points F and G). Positive flow was observed coming from the 42 inch pipe aligned northwest parallel with Foothill at the manhole confluence located at Foothill and Sandholm (Point H). Positive flow was also observed in one of the 24 inch pipes extending to the northwesterly area labeled Sunrise Detention (Points I and J). The rip rap channel within the Sunrise Detention Area included shallow flow at the time of our observations (Point J).

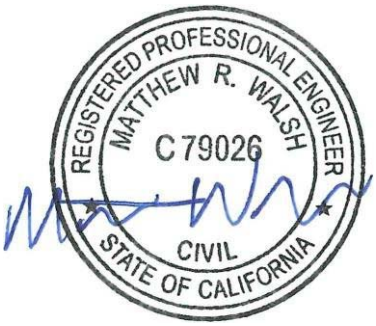
Verification of Underground

Verification of the underground pipe conveyances was accomplished by removing the manhole access covers, measuring inverts of pipes coming in and out of manholes, and use of a scoping camera. A submersible pump was used to dewater the Manholes #4 and #5 (Points D and F) to reduce the water level below the crown of the outlet pipes to allow for measurements on the day of our investigation. This data combined with the visual observations noted above were used to generate the attached Stormwater Conveyance Exhibit to delineate the existing conditions of the study area.

Conclusion

Based on my observations and verifications, I have concluded that drainage from the Sunrise Detention Area upstream of Sandholm Lane is conveyed within the 42 inch pipe under Foothill Boulevard and the 48 inch pipe under Sandholm Lane to the discharge point located 530 feet northeast of the Foothill and Sandholm intersection. If I can provide any further assistance, please don't hesitate to contact me.

Sincerely,



3/28/2018

Matthew R. Walsh, PE, QSD/P Date
Principal Engineer

Attachments: Stormwater Conveyance Exhibit dated 3/20/2018

G.2 - Storm Drain Conveyance Exhibit

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STORMWATER CONVEYANCE EXHIBIT

PREPARED BY: WALSH ENGINEERING
DATE PREPARED: 3/20/2018
DATE OF SITE INVESTIGATION: 3/19/2018

NOTES:
A SITE INVESTIGATION WAS PERFORMED ON 3/19/2018 TO VERIFY STORMWATER CONVEYANCES IN THE VICINTY OF SANDHOLM LANE, FOOTHILL BOULEVARD, AND THE ADJOINING PROPERTIES.

FLOW OBSERVATIONS:

LOCATION	OBSERVED
A. UNNAMED CREEK	POSITIVE FLOW TO SOUTHWEST; 2 INCH DEPTH OF FLOW X 18 INCH WIDTH
B. RIP RAP AREA	PONDED WATER TO DEPTH OF 12 INCHES
C. ROADSIDE DITCH	ZERO FLOW
D. MANHOLE #4	PONDED WATER TO 4 INCHES BELOW CROWN OF 36 INCH PIPE
E. MANHOLE #2	PONDED WATER TO SPRINGLINE OF 36 INCH PIPE
F. MANHOLE #5	PONDED WATER TO 4 INCHES BELOW CROWN OF 48 INCH PIPE
G. MANHOLE #6	PONDED WATER TO 12 INCHES BELOW CROWN OF 48 INCH PIPE; ZERO FLOW FROM 24" PIPES; INVERTS OF 24 INCH PIPES ARE 8 INCHES HIGHER THAN INVERT OF 48 INCH PIPES
H. MANHOLE #8	POSITIVE FLOW TO NORTHEAST; 4 INCH DEPTH OF FLOW IN 48 INCH PIPE; ZERO FLOW FROM 15 INCH PIPE; INVERT OF 15 INCH PIPE IS 6 INCHES HIGHER THAN 48 INCH PIPE
I. MANHOLE #10	POSITIVE FLOW TO SOUTHEAST; 4 INCH DEPTH OF FLOW IN 42 INCH PIPE; 2 INCH DEPTH OF FLOW IN ONE OF THE 24 INCH PIPES
J. DETENTION AREA	POSITIVE FLOW TO EAST; 2 INCH FLOW DEPTH IN 24 INCH PIPE (SOUTHERLY PIPE)

RAINFALL RECORDS:

DATE	24 HOUR ACCUMULATED RAINFALL
3/12/2018	0.47 INCHES
3/13/2018	0.59 INCHES
3/14/2018	0.22 INCHES
3/15/2018	0.84 INCHES
3/16/2018	0.23 INCHES
3/17/2018	0.02 INCHES
3/18/2018	0.01 INCHES
3/19/2018	0.00 INCHES

LEGEND:

- SD 12" — STORM DRAIN PIPE AND SIZE
- DIRECTION OF FLOW
- #2 — STORM DRAIN MANHOLE AND NUMBER
- FLARED END SECTION (INLET OR OUTFALL)
- CAPPED STORM DRAIN FOR FUTURE
- (Y) — FLOW OBSERVATION POINT

0 100'

SCALE: 1"=100'
PAGE SIZE 11"X17"

S REDWOOD HWY (FRONTAGE ROAD)
SANDHOLM LANE
FOOTHILL BLVD
SUNRISE DRIVE
SUNRISE DETENTION AREA
ROADSIDE DITCH
UNNAMED DRAINAGE TO ICARIA CREEK
APN BOOK 117 PAGE 33 MAP OF SUNRISE HILLS
LANDS OF BAUMGARDNER ET AL. APN:117-040-053&084 ADDRESS: 28195 HIGHWAY 101
LANDS OF MLRX2 LLLC DN: 2014-007933 APN:117-040-066
LANDS OF WEISS DN: 2016-058841 APN:117-040-087

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