



APPENDIX G

PRELIMINARY HYDROLOGY STUDY



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**PRELIMINARY HYDROLOGY STUDY
CITRUS SQUARE – SENIOR COMMUNITY
9740 MOODY STREET
CYPRESS, CA
TTM 19147, LOTS 1-3**

Project Address:

9470 Moody Street
Cypress, CA 90630

Prepared For:

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Prepared: March 2021

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**Preliminary Hydrology Study
for
Citrus Square – Senior Community
9470 Moody Street, Cypress, CA**

ACKNOWLEDGEMENT AND SIGNATURE PAGE

This Preliminary Hydrology Study was prepared by C&V Consulting, Inc. under the supervision of Dane McDougall, P.E.

Dane McDougall, R.C.E. 80705
Principal, C&V Consulting, Inc.

Date

1.0 SITE DESCRIPTION

The proposed development comprises 6.34 gross acres and is located at 9470 Moody Street, in the City of Cypress, County of Orange. The site is bound by existing single-family residential to the north, an existing Church to the east, Orange Avenue and existing single-family residential to the south and Moody Street and existing commercial and single-family residential to the west. Existing perimeter controls consist of block walls along the north and east property lines.

The proposed development will be divided into three (3) lots. Lot 1 will consist of attached, multi-family residential condominiums, Lot 2 will consist of attached, affordable senior living multi-family residential and Lot 3 will consist of a shared recreational area. The proposed development will have two (2) entrances, one from Moody Street and Orange Avenue each. The proposed development will consist of proposed drive aisles/ alleys provide access within the site with available parking areas and open space areas.

The proposed residential development ten (10) 2-story, multi-family residential buildings which will consist of 48 townhome units and 50 affordable housing apartment units. Units will consist of 1-, 2- and 3-bedroom layouts, ranging from 767 to 2,022 square feet. Associated parking areas will consist of 96 private garages, 73 private open stalls and 50 carport spaces.

2.0 EXISTING CONDITIONS

Based on site topography, the existing project site contains approximately 51% impervious coverage. In the current condition, the site generally sheet flows overland in both the south and westerly directions. The eastern portion of the site (Subarea X1 and X2) drains overland towards the south to the public right-of-way of Orange Avenue and flows over an existing driveway approach. The western portion of the site drains overland towards the west to the public right-of-way of Moody Street and flows over an existing driveway approach. There are no visible existing storm drain facilities located onsite. An existing public City of Cypress 42” reinforced concrete pipe storm drain system is located within Orange Avenue, flowing in the westerly direction. An existing catch basin is located near the northeast corner of Orange Avenue at Moody Street that connects to the existing storm drain system within Orange Avenue. Stormwater runoff that enters the existing storm drain system within Orange Avenue continues flowing in the westerly direction, where converging with the Lincoln Storm Drain (OCFCD Facility No. B00P01) and Carbon Creek Channel (OCFCD Facility No. B01), then the Coyote Creek and San Gabriel River, ultimately to the discharging to the Pacific Ocean

The Orange County Flood Control District (OCFCD) Drainage Facilities Maps were utilized to verify the drainage pattern of site runoff. The topographic survey was utilized to identify existing onsite high points and overall site conveyance of storm water runoff. The entire site runoff was quantified based on the longest hydraulic path from the most remote high point to drop inlet low point.

Refer to Appendix E for the applicable OCFCD Drainage Facilities Maps. Refer to the “Existing Conditions Hydrology Map” located within Appendix A of this study for additional information.

3.0 PURPOSE OF STUDY

The preliminary hydrology study will estimate the amount of stormwater runoff generated from the project site in the existing and proposed conditions. This study will determine whether detention or other peak flow mitigation methods will be required by comparing the proposed and existing condition peak flow rates for the 10-, 25-, and 100-year storm events.

4.0 PROPOSED CONDITIONS

The proposed residential development will comprise 6.34 acres over three (3) proposed lots, to support the construction 96 residential unit.

The proposed site will be graded to convey and collect stormwater as surface flow to localized sump curb inlets through the site. The proposed catch basins will convey low flows to proposed Modular Wetlands System (MWS) Biofiltration systems for treatment of the required water quality flow rate. During larger storm events, the proposed catch basins will be equipped with Dvert system to divert flows to the proposed underground storm drain system. In addition, each MWS biofiltration system will be design with an internal peak bypass weir to convey larger flow rates. Stormwater runoff will be discharge to the existing City public 42” storm drain located within Orange Avenue with two (2) proposed points of connection.

The site has been graded and designed to maintain historic drainage patterns while limiting the amount of fill over the site.

Refer to “Proposed Conditions Preliminary Hydrology Map” in Appendix A within this study for additional information.

5.0 METHODOLOGY

The project site was analyzed using the Orange County Hydrology Manual 1986. The initial subareas were analyzed for acreage, land-use, soil type, peak flow rate and time of concentration according to the Rational Method described in the manual.

In this preliminary hydrology study, the recommended values per the Orange County Hydrology Manual 1986 were utilized for the percentage of impervious area of the proposed condition.

6.0 RESULTS

Drainage Tributary to Orange Avenue (East)

Drainage Area	Area (ac)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)	T_c (min)
Existing Conditions					
X1	0.58	2.10	2.50	3.21	5.00
X2	0.71	2.48	2.96	3.83	5.23
Total	1.29	4.50	5.39	6.97	--
Proposed Conditions					
P1	0.51	1.47	1.76	2.26	7.28
P2	0.45	1.23	1.48	1.90	8.43
Total	0.96	2.63	3.15	4.06	--

Drainage Tributary to Orange Avenue (West)

Drainage Area	Area (ac)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)	T_c (min)
Existing Conditions*					
X3	1.13	4.10	4.88	6.26	5.00
X4	3.91	14.03	16.72	21.52	5.06
Total	5.04	18.08	21.55	27.73	--
Proposed Conditions					
P3	0.45	1.47	1.75	2.25	5.92
P4	0.64	1.90	2.28	2.94	6.85
P5	0.24	0.70	0.84	1.09	7.02
P6	1.04	2.71	3.27	4.24	8.41
P7	3.00	7.19	8.70	11.32	10.44
Total	5.37	12.87	15.57	20.25	--

Note: All time of concentrations indicated above refer to the 100-year storm event.

* In the existing condition, Subareas X3 and X4 drains in the westerly direction towards Moody Street.

Catch Basin Sizing

Catch basin Sizing was analyzed for the 25-year storm event peak flow rates will be provided during final engineering.

Pipe Sizing

Hydraulic pipe sizing utilizing WSPG for the 25-year storm event peak flow rates will be provided during final engineering. The Hydraulic Grade Line will be evaluated to verify that at least 6" of freeboard is provided within all onsite catch basins and storm drain manholes.

100-Year Water Surface Elevations

Water surface elevations for the 100-year storm event peak flow rates will verify that the proposed finish floor elevations are set at least 1 foot above the water surface elevation and will be provided during final engineering.

7.0 CONCLUSION

The results from this preliminary hydrology study demonstrate that the proposed condition of the project site will generate a lower runoff volume/ peak flow rate and an increased time of concentration than the existing condition of the site. The decrease in runoff volume/ peak flow rate is due to the elongated drainage flow path and utilization of underground storm drain piping. In addition, the existing site condition represents a commercial land use and the proposed multi-family residential. Therefore, no significant impacts to the downstream drainage facilities are anticipated due to the proposed development.

8.0 DESIGN ASSUMPTIONS

1. The property is located in the City of Cypress, Orange County rainfall region.
2. 100-year storm event flood level protection analysis required for habitable structures per the requirements of the Orange County Flood Control District Design Manual.
3. Site located within Hydrologic Soil Type “B” per the USDA Web Soil Survey Data. Refer to Appendix C for a copy of the soil map and information.
4. Impervious coverage correlating to Multi-Family Residential, Condominiums was assumed for the proposed condition of the site. Impervious coverage correlating to Commercial was assumed for the existing condition of the site.
5. Peak flow rates and time of concentrations were calculated using Rational Method described in Orange County Hydrology Manual 1986.

9.0 REFERENCES

1. Orange County Hydrology Manual 1986
2. Orange County Flood Control District Design Manual 2000
3. NRCS Web Soil Survey
4. City of Cypress Storm Drain As-Built Plans
5. Orange County Drainage Facilities Map Nos. 11 & 12

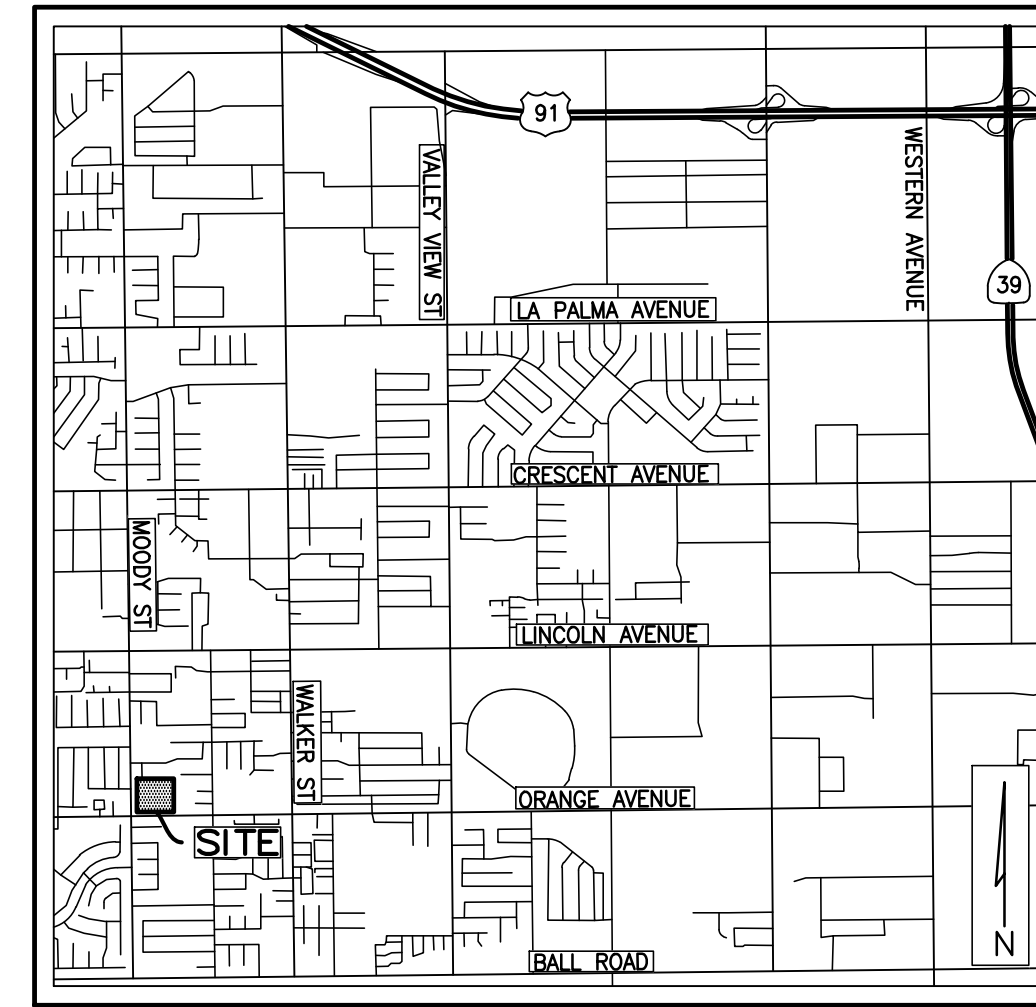
APPENDIX A

HYDROLOGY MAPS

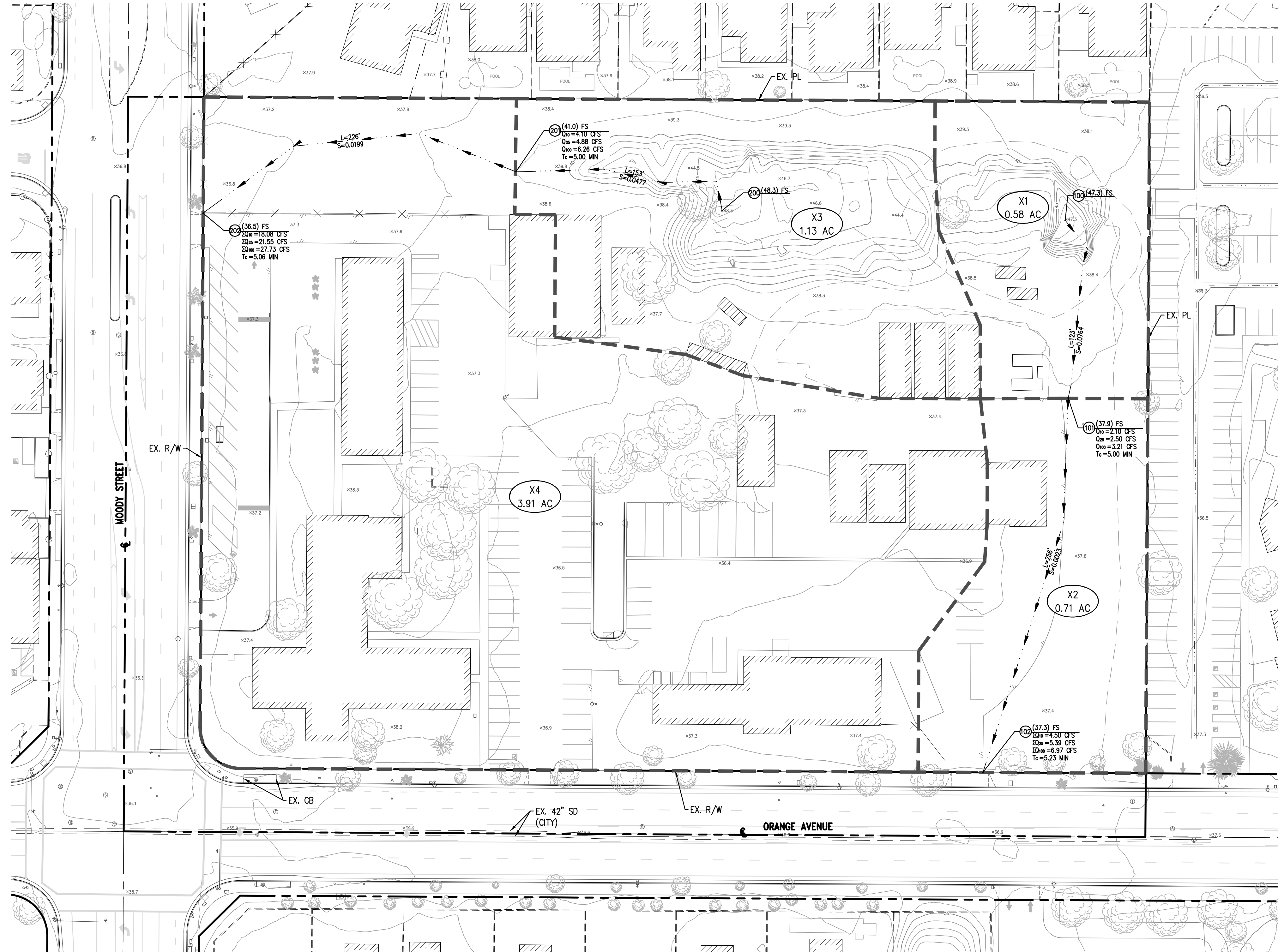
Existing Conditions Hydrology Map

EXISTING CONDITIONS HYDROLOGY MAP

TR 19147
 9470 MOODY SREET
 CITY OF CYPRESS, COUNTY OF ORANGE



VICINITY MAP
 NTS

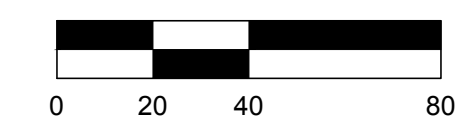


LEGEND

- EXISTING RIGHT-OF-WAY/ BOUNDARY
- DRAINAGE AREA BOUNDARY
- LONGEST FLOW PATH
- FLOW DIRECTION
- XX DRAINAGE AREA ID
- X.XX AC DRAINAGE AREA IN ACRES
- (00.0) FS INITIAL SUBAREA NODE
- (00.0) FS SPOT ELEVATION
- (00.0) FS Q₁₀₀ = X.XX CFS PEAK RUNOFF (CFS)
- (00.0) FS T_c = X.X MIN TIME OF CONCENTRATION (MIN)
- ▨ EXISTING PERVIOUS COVERAGE



SCALE: 1" = 40'



DEVELOPER : REVISIONS					
NO.	DATE	INITIAL	DESCRIPTION	APP	DATE

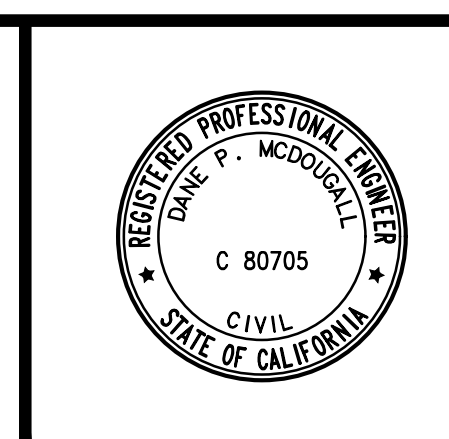
OWNER & DEVELOPER :
MELIA HOMES
 8951 RESEARCH DRIVE, #100
 IRVINE, CA 92618
 PHONE (949) 759-4367

SOILS ENGINEER :

PREPARED BY :

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 CIVIL ENGINEERING
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 WWW.CVC-INC.NET



TRACT NO. 19147
 EXISTING CONDITIONS
 HYDROLOGY MAP

DATE: 3/10/2021
 SHEET 1 OF 1

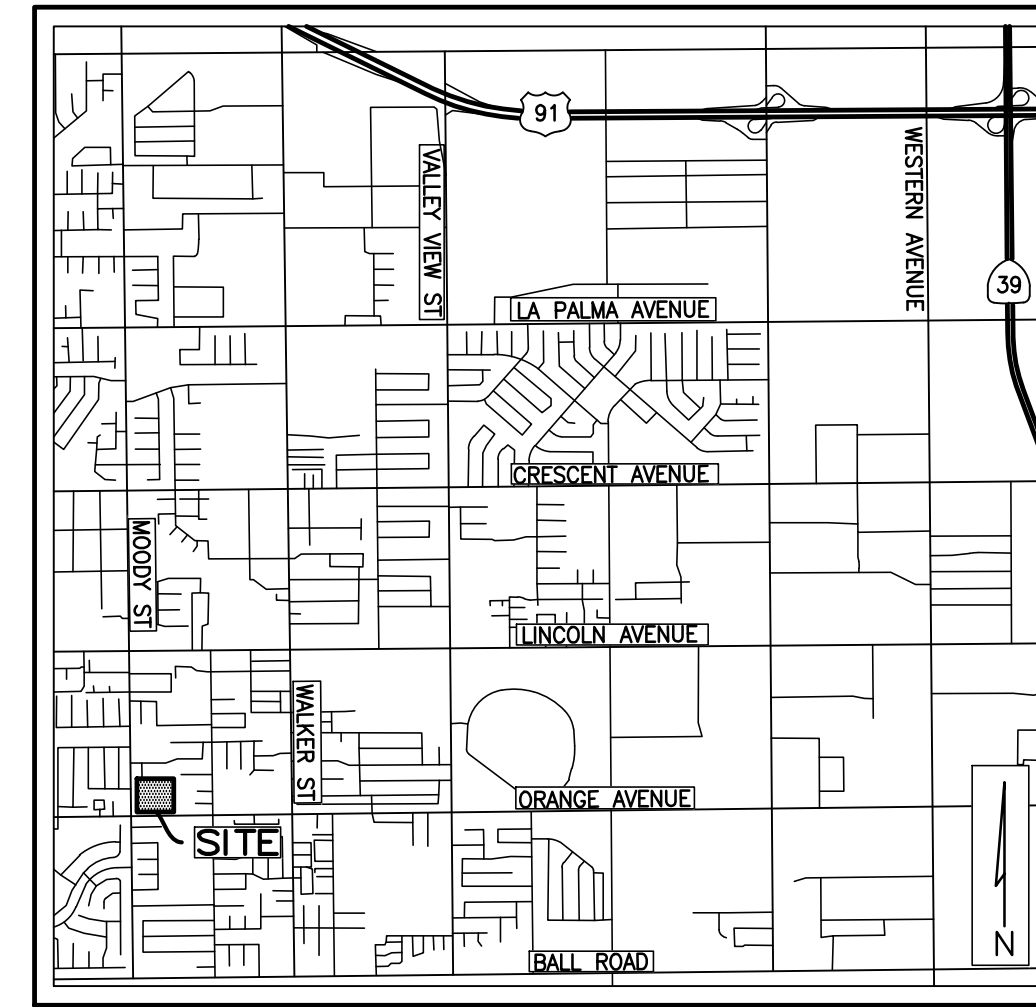
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CITY OF CYPRESS

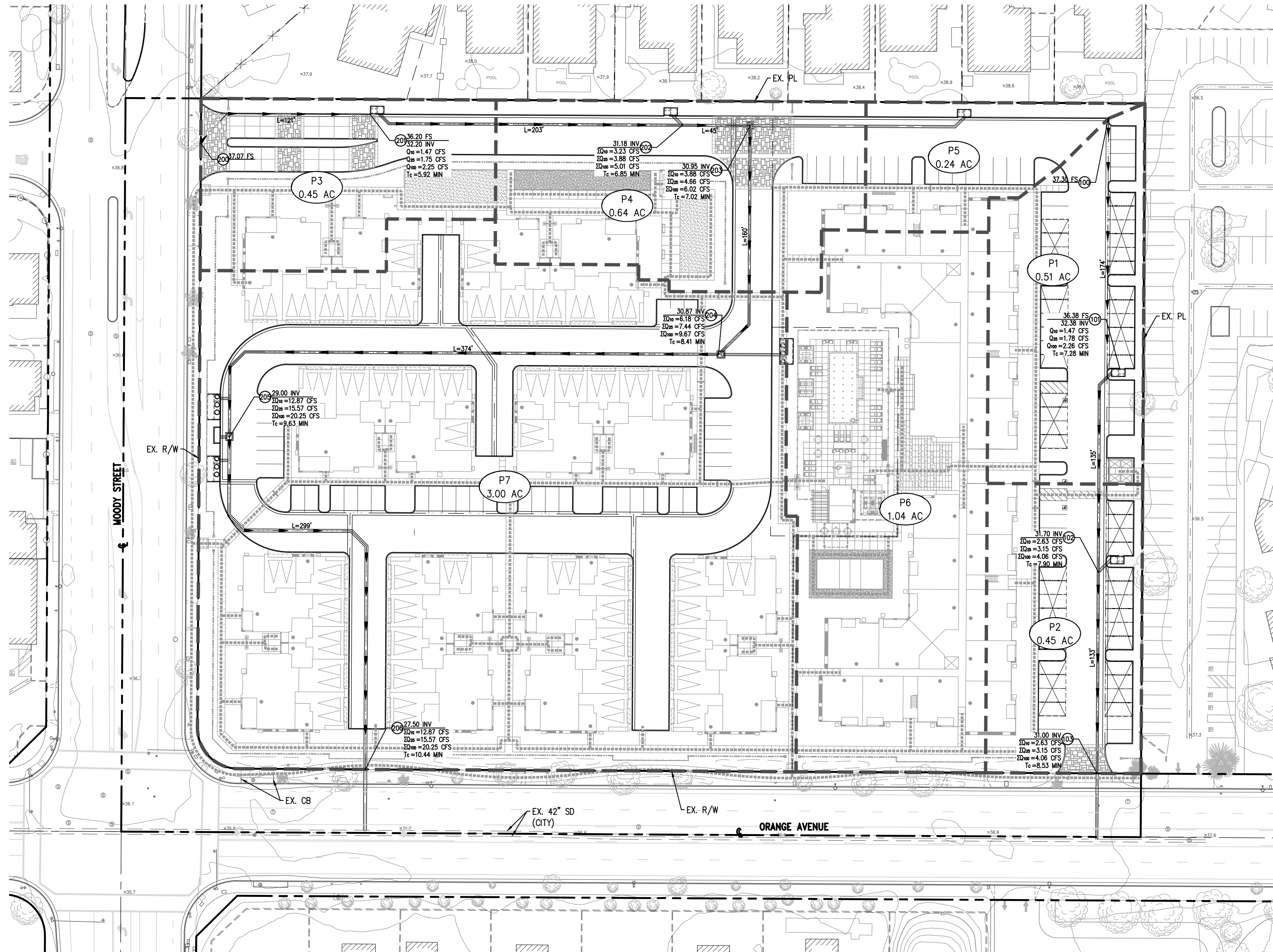
Proposed Conditions Hydrology Map

PROPOSED CONDITIONS HYDROLOGY MAP

TR 19147
9470 MOODY SREET
CITY OF CYPRESS, COUNTY OF ORANGE

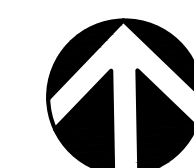


VICINITY MAP
NTS

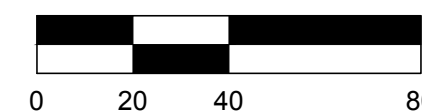


LEGEND

- EXISTING RIGHT-OF-WAY/ BOUNDARY
- PROPOSED RIGHT-OF-WAY/ BOUNDARY
- DRAINAGE AREA BOUNDARY
- LONGEST FLOW PATH
- PROPOSED STORM DRAIN
- PROPOSED CONTOUR
- 98
- FLOW DIRECTION
- XX
- X.XX AC
- INITIAL SUBAREA NODE
- (00.0) FS
- $Q_{pe} = X.XX$ CFS
- $T_c = X.X$ MIN
- PEAK RUNOFF (CFS)
- TIME OF CONCENTRATION (MIN)
- PROPOSED LANDSCAPING



SCALE: 1" = 40'



DEVELOPER :					
REVISIONS					
NO.	DATE	INITIAL	DESCRIPTION	APP	DATE

OWNER & DEVELOPER :

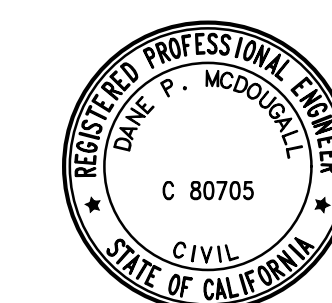
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TRACT NO. 19147
PROPOSED CONDITIONS
HYDROLOGY MAP

DATE: 3/10/2021
SHEET 1 OF 1

SCALE: AS SHOWN DRAWN BY: JH CHECKED BY: JH

CITY OF CYPRESS

APPENDIX B
HYDROLOGY CALCULATIONS

**Existing Conditions Hydrology Calculations
(10-, 25- & 100-year Storm Events)**

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
(c) Copyright 1983-2014 Advanced Engineering Software (aes)
Ver. 21.0 Release Date: 06/01/2014 License ID 1580

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* CITRUS SQUARE - SENIOR COMMUNITY, CYPRESS *
* TTM 19147 *
* EXISTING Q10 *

FILE NAME: ML07X10.DAT
TIME/DATE OF STUDY: 08:37 03/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 123.00
ELEVATION DATA: UPSTREAM(FEET) = 47.30 DOWNSTREAM(FEET) = 37.90

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**} 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.060

SUBAREA T_c AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	0.58	0.30	0.100	36	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

SUBAREA RUNOFF(CFS) = 2.10

TOTAL AREA(ACRES) = 0.58 PEAK FLOW RATE(CFS) = 2.10

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<<
=====

UPSTREAM NODE ELEVATION(FEET) = 37.90

DOWNSTREAM NODE ELEVATION(FEET) = 37.30

CHANNEL LENGTH THRU SUBAREA(FEET) = 256.00

"V" GUTTER WIDTH(FEET) = 5.00 GUTTER HIKE(FEET) = 0.050

PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150

PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200

MAXIMUM DEPTH(FEET) = 0.07

* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.905

SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.71	0.30	0.100	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.34

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 12.14

AVERAGE FLOW DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00

"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.35 T_c (MIN.) = 5.35

SUBAREA AREA(ACRES) = 0.71 SUBAREA RUNOFF(CFS) = 2.48

EFFECTIVE AREA(ACRES) = 1.29 AREA-AVERAGED F_m (INCH/HR) = 0.03

AREA-AVERAGED F_p (INCH/HR) = 0.30 AREA-AVERAGED A_p = 0.10

TOTAL AREA(ACRES) = 1.3 PEAK FLOW RATE(CFS) = 4.50

==>>ERROR:FLOW EXCEEDS CAPACITY OF CHANNEL WITH
NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM ALLOWABLE DEPTH.
AS AN APPROXIMATION, TRAVEL TIME CALCULATIONS ARE BASED

ON FLOW DEPTH EQUAL TO THE SPECIFIED MAXIMUM ALLOWABLE DEPTH.

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 16.36 DEPTH*VELOCITY(FT*FT/SEC) = 1.15
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 379.00 FEET.

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 153.00
ELEVATION DATA: UPSTREAM(FEET) = 48.30 DOWNSTREAM(FEET) = 41.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.060
SUBAREA T_c AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	1.13	0.30	0.100	36	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 4.10
TOTAL AREA(ACRES) = 1.13 PEAK FLOW RATE(CFS) = 4.10

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<<

UPSTREAM NODE ELEVATION(FEET) = 41.00
DOWNSTREAM NODE ELEVATION(FEET) = 36.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 226.00
"V" GUTTER WIDTH(FEET) = 5.00 GUTTER HIKE(FEET) = 0.050
PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
MAXIMUM DEPTH(FEET) = 0.07
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.017
SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	3.91	0.30	0.100	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.05
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 40.19

AVERAGE FLOW DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 5.09
SUBAREA AREA(ACRES) = 3.91 SUBAREA RUNOFF(CFS) = 14.03
EFFECTIVE AREA(ACRES) = 5.04 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 5.0 PEAK FLOW RATE(CFS) = 18.08

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NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM ALLOWABLE DEPTH.
AS AN APPROXIMATION, TRAVEL TIME CALCULATIONS ARE BASED
ON FLOW DEPTH EQUAL TO THE SPECIFIED MAXIMUM ALLOWABLE DEPTH.

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 65.76 DEPTH*VELOCITY(FT*FT/SEC) = 4.60
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 379.00 FEET.

=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 5.0 TC(MIN.) = 5.09
EFFECTIVE AREA(ACRES) = 5.04 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 18.08
=====

=====
END OF RATIONAL METHOD ANALYSIS



RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Ver. 21.0 Release Date: 06/01/2014 License ID 1580

Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* CITRUS SQUARE - SENIOR COMMUNITY, CYPRESS *
* TTM 19147 *
* EXISTING Q25 *

FILE NAME: ML07X25.DAT
TIME/DATE OF STUDY: 08:39 03/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 123.00
ELEVATION DATA: UPSTREAM(FEET) = 47.30 DOWNSTREAM(FEET) = 37.90

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**} 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	0.58	0.30	0.100	56	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

SUBAREA RUNOFF(CFS) = 2.50

TOTAL AREA(ACRES) = 0.58 PEAK FLOW RATE(CFS) = 2.50

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<<

=====

UPSTREAM NODE ELEVATION(FEET) = 37.90

DOWNSTREAM NODE ELEVATION(FEET) = 37.30

CHANNEL LENGTH THRU SUBAREA(FEET) = 256.00

"V" GUTTER WIDTH(FEET) = 5.00 GUTTER HIKE(FEET) = 0.050

PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150

PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200

MAXIMUM DEPTH(FEET) = 0.07

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.670

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.71	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.98

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 14.48

AVERAGE FLOW DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00

"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.29 T_c (MIN.) = 5.29

SUBAREA AREA(ACRES) = 0.71 SUBAREA RUNOFF(CFS) = 2.96

EFFECTIVE AREA(ACRES) = 1.29 AREA-AVERAGED F_m (INCH/HR) = 0.03

AREA-AVERAGED F_p (INCH/HR) = 0.30 AREA-AVERAGED A_p = 0.10

TOTAL AREA(ACRES) = 1.3 PEAK FLOW RATE(CFS) = 5.39

==>>ERROR:FLOW EXCEEDS CAPACITY OF CHANNEL WITH
NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM ALLOWABLE DEPTH.
AS AN APPROXIMATION, TRAVEL TIME CALCULATIONS ARE BASED

ON FLOW DEPTH EQUAL TO THE SPECIFIED MAXIMUM ALLOWABLE DEPTH.

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 19.59 DEPTH*VELOCITY(FT*FT/SEC) = 1.37
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 379.00 FEET.

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 153.00
ELEVATION DATA: UPSTREAM(FEET) = 48.30 DOWNSTREAM(FEET) = 41.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.824

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	1.13	0.30	0.100	56	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 4.88
TOTAL AREA(ACRES) = 1.13 PEAK FLOW RATE(CFS) = 4.88

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<

UPSTREAM NODE ELEVATION(FEET) = 41.00
DOWNSTREAM NODE ELEVATION(FEET) = 36.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 226.00
"V" GUTTER WIDTH(FEET) = 5.00 GUTTER HIKE(FEET) = 0.050
PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
MAXIMUM DEPTH(FEET) = 0.07

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.781

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	3.91	0.30	0.100	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.18
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 47.92

AVERAGE FLOW DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 5.08
SUBAREA AREA(ACRES) = 3.91 SUBAREA RUNOFF(CFS) = 16.72
EFFECTIVE AREA(ACRES) = 5.04 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 5.0 PEAK FLOW RATE(CFS) = 21.55

==>>ERROR:FLOW EXCEEDS CAPACITY OF CHANNEL WITH
NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM ALLOWABLE DEPTH.
AS AN APPROXIMATION, TRAVEL TIME CALCULATIONS ARE BASED
ON FLOW DEPTH EQUAL TO THE SPECIFIED MAXIMUM ALLOWABLE DEPTH.

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 78.37 DEPTH*VELOCITY(FT*FT/SEC) = 5.49
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 379.00 FEET.

=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 5.0 TC(MIN.) = 5.08
EFFECTIVE AREA(ACRES) = 5.04 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 21.55
=====

=====
END OF RATIONAL METHOD ANALYSIS



RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* CITRUS SQUARE - SENIOR COMMUNITY, CYPRESS *
* TTM 19147 *
* EXISTING Q100 *

FILE NAME: ML07X100.DAT
TIME/DATE OF STUDY: 08:41 03/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 123.00
ELEVATION DATA: UPSTREAM(FEET) = 47.30 DOWNSTREAM(FEET) = 37.90

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**0.20}$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.187

SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	0.58	0.30	0.100	76	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

SUBAREA RUNOFF(CFS) = 3.21

TOTAL AREA(ACRES) = 0.58 PEAK FLOW RATE(CFS) = 3.21

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<<

=====

UPSTREAM NODE ELEVATION(FEET) = 37.90

DOWNSTREAM NODE ELEVATION(FEET) = 37.30

CHANNEL LENGTH THRU SUBAREA(FEET) = 256.00

"V" GUTTER WIDTH(FEET) = 5.00 GUTTER HIKE(FEET) = 0.050

PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150

PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200

MAXIMUM DEPTH(FEET) = 0.07

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.031

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	0.71	0.30	0.100	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 5.13

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 18.65

AVERAGE FLOW DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00

"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.23 T_c (MIN.) = 5.23

SUBAREA AREA(ACRES) = 0.71 SUBAREA RUNOFF(CFS) = 3.83

EFFECTIVE AREA(ACRES) = 1.29 AREA-AVERAGED F_m (INCH/HR) = 0.03

AREA-AVERAGED F_p (INCH/HR) = 0.30 AREA-AVERAGED A_p = 0.10

TOTAL AREA(ACRES) = 1.3 PEAK FLOW RATE(CFS) = 6.97

==>>ERROR:FLOW EXCEEDS CAPACITY OF CHANNEL WITH
NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM ALLOWABLE DEPTH.
AS AN APPROXIMATION, TRAVEL TIME CALCULATIONS ARE BASED

ON FLOW DEPTH EQUAL TO THE SPECIFIED MAXIMUM ALLOWABLE DEPTH.

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 25.33 DEPTH*VELOCITY(FT*FT/SEC) = 1.77
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 379.00 FEET.

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 153.00
ELEVATION DATA: UPSTREAM(FEET) = 48.30 DOWNSTREAM(FEET) = 41.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.000
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.187
SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	1.13	0.30	0.100	76	5.00

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 6.26
TOTAL AREA(ACRES) = 1.13 PEAK FLOW RATE(CFS) = 6.26

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<<

UPSTREAM NODE ELEVATION(FEET) = 41.00
DOWNSTREAM NODE ELEVATION(FEET) = 36.50
CHANNEL LENGTH THRU SUBAREA(FEET) = 226.00
"V" GUTTER WIDTH(FEET) = 5.00 GUTTER HIKE(FEET) = 0.050
PAVEMENT LIP(FEET) = 0.010 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.00200
MAXIMUM DEPTH(FEET) = 0.07
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.144
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	B	3.91	0.30	0.100	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.96
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 61.67

AVERAGE FLOW DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.06 Tc(MIN.) = 5.06
SUBAREA AREA(ACRES) = 3.91 SUBAREA RUNOFF(CFS) = 21.52
EFFECTIVE AREA(ACRES) = 5.04 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 5.0 PEAK FLOW RATE(CFS) = 27.73

==>>ERROR:FLOW EXCEEDS CAPACITY OF CHANNEL WITH
NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM ALLOWABLE DEPTH.
AS AN APPROXIMATION, TRAVEL TIME CALCULATIONS ARE BASED
ON FLOW DEPTH EQUAL TO THE SPECIFIED MAXIMUM ALLOWABLE DEPTH.

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH(FEET) = 0.07 FLOOD WIDTH(FEET) = 15.00
FLOW VELOCITY(FEET/SEC.) = 100.85 DEPTH*VELOCITY(FT*FT/SEC) = 7.06
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 379.00 FEET.

=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 5.0 TC(MIN.) = 5.06
EFFECTIVE AREA(ACRES) = 5.04 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 27.73
=====

=====
END OF RATIONAL METHOD ANALYSIS



**Proposed Conditions Hydrology Calculations
(10-, 25- & 100-year Storm Events)**

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* CITRUS SQUARE - SENIOR COMMUNITY, CYPRESS *
* TTM 19147 *
* PROPOSED Q10 *

FILE NAME: ML07P10.DAT
TIME/DATE OF STUDY: 09:14 03/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 174.00
ELEVATION DATA: UPSTREAM(FEET) = 37.30 DOWNSTREAM(FEET) = 36.38

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**0.20}$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 7.280
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.273

SUBAREA T_c AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	0.51	0.30	0.200	36	7.28

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200

SUBAREA RUNOFF(CFS) = 1.47

TOTAL AREA(ACRES) = 0.51 PEAK FLOW RATE(CFS) = 1.47

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.38 DOWNSTREAM(FEET) = 31.70
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.22
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.47
PIPE TRAVEL TIME(MIN.) = 0.70 T_c (MIN.) = 7.98
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 309.00 FEET.

FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

=====

MAINLINE T_c (MIN.) = 7.98
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.106
SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.45	0.30	0.200	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 1.23
EFFECTIVE AREA(ACRES) = 0.96 AREA-AVERAGED Fm(INCH/HR) = 0.06

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 1.0 PEAK FLOW RATE(CFS) = 2.63

FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 31.70 DOWNSTREAM(FEET) = 31.00
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.82
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.63
PIPE TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 8.57
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 444.00 FEET.

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 121.00
ELEVATION DATA: UPSTREAM(FEET) = 37.07 DOWNSTREAM(FEET) = 36.20

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.920
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.685
SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	0.45	0.30	0.200	36	5.92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA RUNOFF(CFS) = 1.47
TOTAL AREA(ACRES) = 0.45 PEAK FLOW RATE(CFS) = 1.47

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.20 DOWNSTREAM(FEET) = 31.18
FLOW LENGTH(FEET) = 203.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 5.5 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 3.22
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.47
 PIPE TRAVEL TIME(MIN.) = 1.05 Tc(MIN.) = 6.97
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 324.00 FEET.

FLOW PROCESS FROM NODE 202.00 TO NODE 202.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 6.97
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.356
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.64	0.30	0.200	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA(ACRES) = 0.64 SUBAREA RUNOFF(CFS) = 1.90
 EFFECTIVE AREA(ACRES) = 1.09 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 1.1 PEAK FLOW RATE(CFS) = 3.23

FLOW PROCESS FROM NODE 202.00 TO NODE 203.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 31.18 DOWNSTREAM(FEET) = 30.95
 FLOW LENGTH(FEET) = 45.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.01
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.23
 PIPE TRAVEL TIME(MIN.) = 0.19 Tc(MIN.) = 7.16
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 369.00 FEET.

FLOW PROCESS FROM NODE 203.00 TO NODE 203.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 7.16
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.305
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN

APARTMENTS B 0.24 0.30 0.200 36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 0.24 SUBAREA RUNOFF(CFS) = 0.70
EFFECTIVE AREA(ACRES) = 1.33 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 1.3 PEAK FLOW RATE(CFS) = 3.88

FLOW PROCESS FROM NODE 203.00 TO NODE 204.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.95 DOWNSTREAM(FEET) = 30.87
FLOW LENGTH(FEET) = 160.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 1.74
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.88
PIPE TRAVEL TIME(MIN.) = 1.53 Tc(MIN.) = 8.69
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 529.00 FEET.

FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

=====

MAINLINE Tc(MIN.) = 8.69
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.958
SUBAREA LOSS RATE DATA(AMC I):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
APARTMENTS B 1.04 0.30 0.200 36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 1.04 SUBAREA RUNOFF(CFS) = 2.71
EFFECTIVE AREA(ACRES) = 2.37 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 2.4 PEAK FLOW RATE(CFS) = 6.18

FLOW PROCESS FROM NODE 204.00 TO NODE 205.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.87 DOWNSTREAM(FEET) = 29.00
FLOW LENGTH(FEET) = 374.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.8 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.60
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 6.18
 PIPE TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 10.04
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 903.00 FEET.

FLOW PROCESS FROM NODE 205.00 TO NODE 205.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 10.04
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.722
 SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	3.00	0.30	0.200	36

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 7.19
 EFFECTIVE AREA(ACRES) = 5.37 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 5.4 PEAK FLOW RATE(CFS) = 12.87

FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 29.00 DOWNSTREAM(FEET) = 27.50
 FLOW LENGTH(FEET) = 299.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.55
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 12.87
 PIPE TRAVEL TIME(MIN.) = 0.90 Tc(MIN.) = 10.94
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 1202.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 5.4 TC(MIN.) = 10.94
 EFFECTIVE AREA(ACRES) = 5.37 AREA-AVERAGED Fm(INCH/HR)= 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.200
 PEAK FLOW RATE(CFS) = 12.87

END OF RATIONAL METHOD ANALYSIS



RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* CITRUS SQUARE - SENIOR COMMUNITY, CYPRESS *
* TTM 19147 *
* PROPOSED Q25 *

FILE NAME: ML07P25.DAT
TIME/DATE OF STUDY: 09:15 03/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/ SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 174.00
ELEVATION DATA: UPSTREAM(FEET) = 37.30 DOWNSTREAM(FEET) = 36.38

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**0.20}$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 7.280

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.900

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	0.51	0.30	0.200	56	7.28

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.200

SUBAREA RUNOFF(CFS) = 1.76

TOTAL AREA(ACRES) = 0.51 PEAK FLOW RATE(CFS) = 1.76

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.38 DOWNSTREAM(FEET) = 31.70
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.38
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.76
PIPE TRAVEL TIME(MIN.) = 0.66 T_c (MIN.) = 7.94
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 309.00 FEET.

FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

=====

MAINLINE T_c (MIN.) = 7.94

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.712

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.45	0.30	0.200	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.200

SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 1.48

EFFECTIVE AREA(ACRES) = 0.96 AREA-AVERAGED F_m (INCH/HR) = 0.06

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 1.0 PEAK FLOW RATE(CFS) = 3.15

FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 31.70 DOWNSTREAM(FEET) = 31.00
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 8.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.01
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.15
PIPE TRAVEL TIME(MIN.) = 0.56 Tc(MIN.) = 8.51
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 444.00 FEET.

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 121.00
ELEVATION DATA: UPSTREAM(FEET) = 37.07 DOWNSTREAM(FEET) = 36.20

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.920
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.384
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	0.45	0.30	0.200	56	5.92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA RUNOFF(CFS) = 1.75
TOTAL AREA(ACRES) = 0.45 PEAK FLOW RATE(CFS) = 1.75

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.20 DOWNSTREAM(FEET) = 31.18
FLOW LENGTH(FEET) = 203.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.0 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 3.38
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.75
 PIPE TRAVEL TIME(MIN.) = 1.00 Tc(MIN.) = 6.92
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 324.00 FEET.

FLOW PROCESS FROM NODE 202.00 TO NODE 202.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 6.92
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.013
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.64	0.30	0.200	56

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA(ACRES) = 0.64 SUBAREA RUNOFF(CFS) = 2.28
 EFFECTIVE AREA(ACRES) = 1.09 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 1.1 PEAK FLOW RATE(CFS) = 3.88

FLOW PROCESS FROM NODE 202.00 TO NODE 203.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 31.18 DOWNSTREAM(FEET) = 30.95
 FLOW LENGTH(FEET) = 45.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 9.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.20
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.88
 PIPE TRAVEL TIME(MIN.) = 0.18 Tc(MIN.) = 7.10
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 369.00 FEET.

FLOW PROCESS FROM NODE 203.00 TO NODE 203.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 7.10
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.955
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN

APARTMENTS B 0.24 0.30 0.200 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA(ACRES) = 0.24 SUBAREA RUNOFF(CFS) = 0.84
 EFFECTIVE AREA(ACRES) = 1.33 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 1.3 PEAK FLOW RATE(CFS) = 4.66

 FLOW PROCESS FROM NODE 203.00 TO NODE 204.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====
 ELEVATION DATA: UPSTREAM(FEET) = 30.95 DOWNSTREAM(FEET) = 30.87
 FLOW LENGTH(FEET) = 160.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 18.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 1.78
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 4.66
 PIPE TRAVEL TIME(MIN.) = 1.49 Tc(MIN.) = 8.59
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 529.00 FEET.

 FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====
 MAINLINE Tc(MIN.) = 8.59
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.550
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 APARTMENTS B 1.04 0.30 0.200 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA(ACRES) = 1.04 SUBAREA RUNOFF(CFS) = 3.27
 EFFECTIVE AREA(ACRES) = 2.37 AREA-AVERAGED Fm(INCH/HR) = 0.06
 AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 2.4 PEAK FLOW RATE(CFS) = 7.44

 FLOW PROCESS FROM NODE 204.00 TO NODE 205.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====
 ELEVATION DATA: UPSTREAM(FEET) = 30.87 DOWNSTREAM(FEET) = 29.00
 FLOW LENGTH(FEET) = 374.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 12.7 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 4.89
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.44
PIPE TRAVEL TIME(MIN.) = 1.28 Tc(MIN.) = 9.87
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 903.00 FEET.

FLOW PROCESS FROM NODE 205.00 TO NODE 205.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 9.87
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.283
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
APARTMENTS B 3.00 0.30 0.200 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 8.70
EFFECTIVE AREA(ACRES) = 5.37 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 5.4 PEAK FLOW RATE(CFS) = 15.57

FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 29.00 DOWNSTREAM(FEET) = 27.50
FLOW LENGTH(FEET) = 299.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.67
ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.57
PIPE TRAVEL TIME(MIN.) = 0.88 Tc(MIN.) = 10.75
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 1202.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 5.4 TC(MIN.) = 10.75
EFFECTIVE AREA(ACRES) = 5.37 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.200
PEAK FLOW RATE(CFS) = 15.57

END OF RATIONAL METHOD ANALYSIS



RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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Analysis prepared by:

***** DESCRIPTION OF STUDY *****
* CITRUS SQUARE - SENIOR COMMUNITY, CYPRESS *
* TTM 19147 *
* PROPOSED Q100 *

FILE NAME: ML07P100.DAT
TIME/DATE OF STUDY: 09:17 03/10/2021

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/ SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 174.00
ELEVATION DATA: UPSTREAM(FEET) = 37.30 DOWNSTREAM(FEET) = 36.38

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**0.20}$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 7.280
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.989

SUBAREA T_c AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	0.51	0.30	0.200	76	7.28

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200

SUBAREA RUNOFF(CFS) = 2.26

TOTAL AREA(ACRES) = 0.51 PEAK FLOW RATE(CFS) = 2.26

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====

ELEVATION DATA: UPSTREAM(FEET) = 32.38 DOWNSTREAM(FEET) = 31.70
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.63
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.26
PIPE TRAVEL TIME(MIN.) = 0.62 T_c (MIN.) = 7.90
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 102.00 = 309.00 FEET.

FLOW PROCESS FROM NODE 102.00 TO NODE 102.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====

MAINLINE T_c (MIN.) = 7.90

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.761

SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	0.45	0.30	0.200	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200

SUBAREA AREA(ACRES) = 0.45 SUBAREA RUNOFF(CFS) = 1.90

EFFECTIVE AREA(ACRES) = 0.96 AREA-AVERAGED Fm(INCH/HR) = 0.06

AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 1.0 PEAK FLOW RATE(CFS) = 4.06

FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 31.70 DOWNSTREAM(FEET) = 31.00
FLOW LENGTH(FEET) = 135.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 9.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.28
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 4.06
PIPE TRAVEL TIME(MIN.) = 0.53 Tc(MIN.) = 8.43
LONGEST FLOWPATH FROM NODE 100.00 TO NODE 103.00 = 444.00 FEET.

FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 121.00
ELEVATION DATA: UPSTREAM(FEET) = 37.07 DOWNSTREAM(FEET) = 36.20

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.920
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.617
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	0.45	0.30	0.200	76	5.92

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA RUNOFF(CFS) = 2.25
TOTAL AREA(ACRES) = 0.45 PEAK FLOW RATE(CFS) = 2.25

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 32.20 DOWNSTREAM(FEET) = 31.18
FLOW LENGTH(FEET) = 203.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.9 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 3.62
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.25
PIPE TRAVEL TIME(MIN.) = 0.93 Tc(MIN.) = 6.85
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 202.00 = 324.00 FEET.

FLOW PROCESS FROM NODE 202.00 TO NODE 202.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 6.85
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.164
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
APARTMENTS B 0.64 0.30 0.200 76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 0.64 SUBAREA RUNOFF(CFS) = 2.94
EFFECTIVE AREA(ACRES) = 1.09 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 1.1 PEAK FLOW RATE(CFS) = 5.01

FLOW PROCESS FROM NODE 202.00 TO NODE 203.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 31.18 DOWNSTREAM(FEET) = 30.95
FLOW LENGTH(FEET) = 45.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 10.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.46
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 5.01
PIPE TRAVEL TIME(MIN.) = 0.17 Tc(MIN.) = 7.02
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 203.00 = 369.00 FEET.

FLOW PROCESS FROM NODE 203.00 TO NODE 203.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN.) = 7.02
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.093
SUBAREA LOSS RATE DATA(AMC III):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
APARTMENTS B 0.24 0.30 0.200 76

SUBAREA AVERAGE PERVIOUS LOSS RATE, $F_p(\text{INCH/HR}) = 0.30$
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, $A_p = 0.200$
 SUBAREA AREA(ACRES) = 0.24 SUBAREA RUNOFF(CFS) = 1.09
 EFFECTIVE AREA(ACRES) = 1.33 AREA-AVERAGED $F_m(\text{INCH/HR}) = 0.06$
 AREA-AVERAGED $F_p(\text{INCH/HR}) = 0.30$ AREA-AVERAGED $A_p = 0.20$
 TOTAL AREA(ACRES) = 1.3 PEAK FLOW RATE(CFS) = 6.02

 FLOW PROCESS FROM NODE 203.00 TO NODE 204.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.95 DOWNSTREAM(FEET) = 30.87
 FLOW LENGTH(FEET) = 160.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 19.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 1.92
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 6.02
 PIPE TRAVEL TIME(MIN.) = 1.39 $T_c(\text{MIN.}) = 8.41$
 LONGEST FLOWPATH FROM NODE 200.00 TO NODE 204.00 = 529.00 FEET.

 FLOW PROCESS FROM NODE 204.00 TO NODE 204.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE $T_c(\text{MIN.}) = 8.41$
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.593
 SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
APARTMENTS	B	1.04	0.30	0.200	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, $F_p(\text{INCH/HR}) = 0.30$
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, $A_p = 0.200$
 SUBAREA AREA(ACRES) = 1.04 SUBAREA RUNOFF(CFS) = 4.24
 EFFECTIVE AREA(ACRES) = 2.37 AREA-AVERAGED $F_m(\text{INCH/HR}) = 0.06$
 AREA-AVERAGED $F_p(\text{INCH/HR}) = 0.30$ AREA-AVERAGED $A_p = 0.20$
 TOTAL AREA(ACRES) = 2.4 PEAK FLOW RATE(CFS) = 9.67

 FLOW PROCESS FROM NODE 204.00 TO NODE 205.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 30.87 DOWNSTREAM(FEET) = 29.00
 FLOW LENGTH(FEET) = 374.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 21.0 INCH PIPE IS 15.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.13

ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 9.67
PIPE TRAVEL TIME(MIN.) = 1.22 Tc(MIN.) = 9.63
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 205.00 = 903.00 FEET.

FLOW PROCESS FROM NODE 205.00 TO NODE 205.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN.) = 9.63
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.251
SUBAREA LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	B	3.00	0.30	0.200	76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 3.00 SUBAREA RUNOFF(CFS) = 11.32
EFFECTIVE AREA(ACRES) = 5.37 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 5.4 PEAK FLOW RATE(CFS) = 20.25

FLOW PROCESS FROM NODE 205.00 TO NODE 206.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 29.00 DOWNSTREAM(FEET) = 27.50
FLOW LENGTH(FEET) = 299.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 27.0 INCH PIPE IS 21.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.12
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 20.25
PIPE TRAVEL TIME(MIN.) = 0.81 Tc(MIN.) = 10.44
LONGEST FLOWPATH FROM NODE 200.00 TO NODE 206.00 = 1202.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 5.4 TC(MIN.) = 10.44
EFFECTIVE AREA(ACRES) = 5.37 AREA-AVERAGED Fm(INCH/HR)= 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.200
PEAK FLOW RATE(CFS) = 20.25

END OF RATIONAL METHOD ANALYSIS

↑

APPENDIX C
USDA Soil Map & Information

Orange County and Part of Riverside County, California

1000LA—Urban land-Metz-Pico complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2mytv

Elevation: 10 to 560 feet

Mean annual precipitation: 13 to 19 inches

Mean annual air temperature: 64 to 66 degrees F

Frost-free period: 350 to 365 days

Map Unit Composition

Urban land: 45 percent

Metz and similar soils: 20 percent

Pico and similar soils: 15 percent

Minor components: 20 percent

*Estimates are based on observations, descriptions, and transects of
the mapunit.*

Description of Urban Land

Setting

Landform: Flood plains

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 0 inches to manufactured layer

Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Description of Metz

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Discontinuous human-transported material over
mixed alluvium derived from granite and/or sedimentary rock

Typical profile

A - 0 to 3 inches: loamy sand

C1 - 3 to 18 inches: loamy sand

C2 - 18 to 37 inches: sand

2C3 - 37 to 49 inches: silt loam

3C4 - 49 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: NoneRare

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0
mmhos/cm)

Available water capacity: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Pico

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Discontinuous human-transported material over
mixed alluvium derived from granite and/or sedimentary rock

Typical profile

A1 - 0 to 5 inches: loam

A2 - 5 to 18 inches: very fine sandy loam

AB - 18 to 47 inches: fine sandy loam

Bk - 47 to 79 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High
(1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: NoneRare

Frequency of ponding: None

Calcium carbonate, maximum content: 2 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0
mmhos/cm)

Available water capacity: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Corralitos

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hueneme, drained

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

San emigdio

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Xerorthents

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

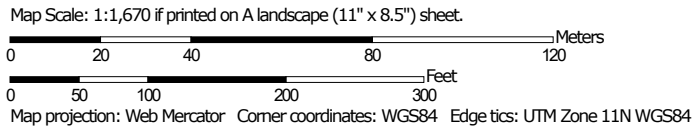
Data Source Information

Soil Survey Area: Orange County and Part of Riverside County, California
Survey Area Data: Version 14, May 27, 2020

Soil Map—Orange County and Part of Riverside County, California
(MELA-007)



Soil Map may not be valid at this scale.





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 1:24,000.

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: Orange County and Part of Riverside County, California
Survey Area Data: Version 14, May 27, 2020

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

Date(s) aerial images were photographed: Apr 13, 2018—Feb 8, 2019

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
1000LA	Urban land-Metz-Pico complex, 0 to 2 percent slopes	12.7	100.0%
Totals for Area of Interest		12.7	100.0%

APPENDIX D

Hydraulic Calculations

Catch Basin Sizing

To be provided during final engineering

WSPG

To be provided during final engineering

100-year Water Surface Elevation Calculations

To be provided during final engineering

APPENDIX E
Reference Materials

Tentative Tract Map No. 19147

LEGAL DESCRIPTION:
THE WEST HALF OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 16, TOWNSHIP 4 SOUTH, RANGE 11 WEST, SAN BERNARDINO, IN THE CITY OF CYPRESS, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS PER PLAT FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXCEPT THAT PORTION THEREOF LYING NORTHERLY OF THE SOUTHERLY BOUNDARY LINE OF TRACT NO. 8267, AS PER MAP FILED IN BOOK 324, PAGES 49 AND 50 OF MISCELLANEOUS MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

ALSO EXCEPT THEREFROM ALL MINERALS, GAS, OIL, PETROLEUM, NAPHTHA AND OTHER HYDROCARBON SUBSTANCES BELOW THE DEPTH OF 500 FEET FROM THE SURFACE OF THE ABOVE DESCRIBED PROPERTY.

SITE ADDRESS:
9470 MOODY STREET CYPRESS, CALIFORNIA.

VESTED OWNER:
CYPRESS SCHOOL DISTRICT, A PUBLIC SCHOOL DISTRICT

BASIS OF BEARINGS:
BEARINGS SHOWN HEREON ARE BASED ON THE BEARING BETWEEN ORANGE COUNTY SURVEYOR'S HORIZONTAL CONTROL STATION GPS NO. 3714 AND GPS NO. 3713 BEING NORTH 89°41'21" WEST PER RECORDS ON FILE IN THE OFFICE OF THE ORANGE COUNTY SURVEYOR.

DATUM STATEMENT:
COORDINATES SHOWN ARE BASED ON THE CALIFORNIA COORDINATE SYSTEM (CCS83), ZONE VI, 1983 N.A.D. (2017.50 EPOCH OCS GPS ADJUSTMENT). ALL DISTANCES SHOWN ARE GROUND UNLESS OTHERWISE NOTED. TO OBTAIN GRID DISTANCE, MULTIPLY GROUND DISTANCE BY 0.99999426, (GPS 3713 VALUE).

BENCHMARK STATEMENT:
OC SURVEY BENCHMARK NO. 1M-19-04
ELEV: 39.453 (NAVD88)
DESCRIBED AS: DESCRIBED BY OCS 2004 - FOUND 3 3/4" OCS ALUMINUM BENCHMARK DISK STAMPED "1M-19-04", SET IN THE SOUTHWESTERLY CORNER OF A 4.5 FT. BY 4.5 FT. CONCRETE CATCH BASIN. MONUMENT IS LOCATED IN THE NORTHWESTERLY CORNER OF THE INTERSECTION OF LINCOLN AVENUE AND MOODY STREET, 33 FT. NORTHERLY OF THE CENTER MEDIAN ALONG LINCOLN AND 102 FT. WESTERLY OF THE CENTERLINE OF MOODY STREET. MONUMENT IS SET LEVEL WITH THE SIDEWALK. (TABLE A-5)

FLOOD NOTE:
THE SUBJECT PROPERTY FALLS WITHIN "ZONE X: AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD." PER FEMA MAP NO. 06059C0108J, A PRINTED PANEL, EFFECTIVE DECEMBER 3, 2009 (TABLE A-3).

LAND USE SUMMARY:
GROSS AREA: 7.50 AC
NET AREA: 6.34 AC
TOTAL PROPOSED RESIDENTIAL LOTS: 3
TOTAL PROPOSED DWELLING UNITS: 98 CONDOS

LOT	AREA
1	169,604 S.F.
2	94,919 S.F.
3	11,560 S.F.

UTILITY PURVEYORS & SERVICES:
WATER: GOLDEN STATE WATER COMPANY
(800) 999-4033

SEWER: CITY OF CYPRESS PUBLIC WORKS
(714) 229-6740

ELECTRIC: SOUTHERN CALIFORNIA EDISON
(800) 655-4555

GAS: SOUTHERN CALIFORNIA GAS
(800) 427-2200

TELEPHONE/CABLE:
AT&T: (800) 310-2355
VERIZON: (800) 483-5000
FRONTIER: (833) 747-9645
CHARTER/SPECTRUM: (855) 243-8892

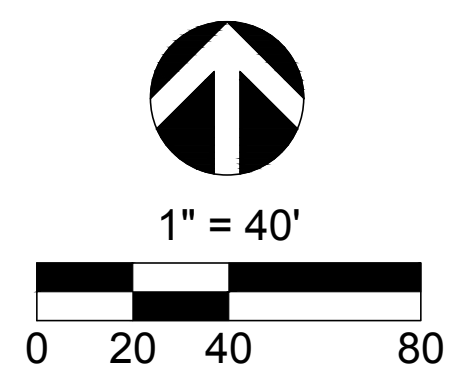
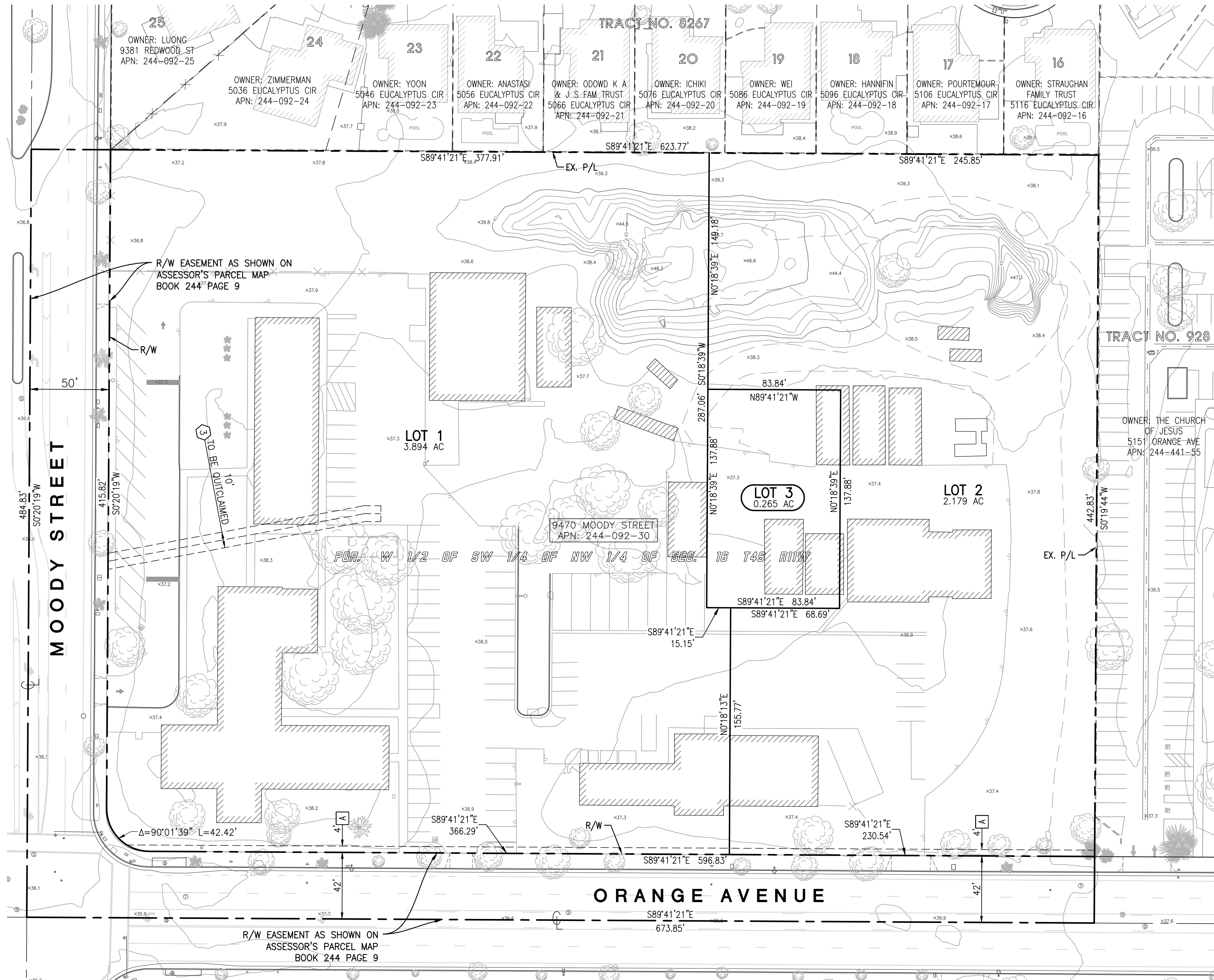
TRASH/REFUSE: VALLEY VISTA SERVICES
(714) 380-5450

SCHOOL DISTRICT: CYPRESS SCHOOL DISTRICT
(714) 220-6900

TENTATIVE TRACT MAP NO. 19147

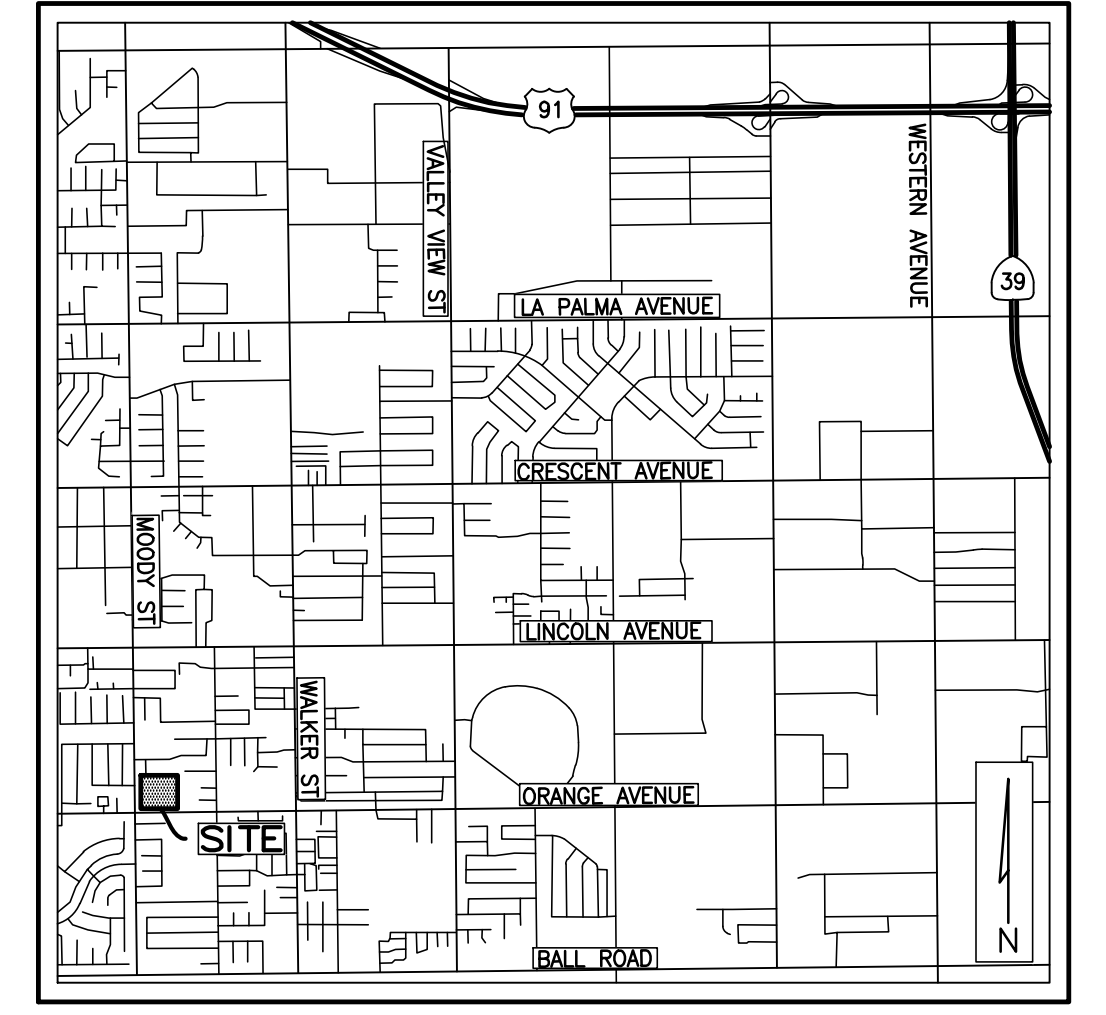
FOR CONDOMINIUM PURPOSES

IN THE CITY OF CYPRESS, COUNTY OF ORANGE, STATE OF CALIFORNIA



- LEGEND:**
- CENTERLINE
 - - - EX. BOUNDARY
 - - - EASEMENT
 - - - EX. LOT LINE
 - - - PROP. LOT LINE
- SHEET INDEX:**
- 1 - TENTATIVE MAP
 - 2 - PRELIMINARY GRADING PLAN
 - 3 - PRELIMINARY UTILITY PLAN
 - 4 - PRELIMINARY FIRE ACCESS & HYDRANT LOCATION PLAN

ENGINEER'S STATEMENT:
THIS TENTATIVE MAP WAS PREPARED BY ME, OR UNDER MY DIRECTION ON MARCH 9, 2021.
DANE P. MCDUGALL, R.C.E. 80705



VICINITY MAP
SCALE: NONE

DEVELOPER:
MELIA HOMES
8951 RESEARCH DRIVE, #100
IRVINE, CA 92618
(949) 759-4367
CONTACT: CHAD BROWN, VICE PRESIDENT OF PLANNING & DEVELOPMENT

CIVIL ENGINEER:
C&V CONSULTING, INC.
9830 IRVINE CENTER DRIVE
IRVINE, CA 92618
(949) 916-3800
CONTACT: DANE MCDUGALL, P.E., P.L.S., PRINCIPAL

OWNER:
CYPRESS SCHOOL DISTRICT
2031 ORCHARD DRIVE
CYPRESS, CA 90630
(714) 220-6900

ARCHITECT:
BASSENIAN LAGONI
9470 MOODY STREET
NEWPORT BEACH, CA 92660
(949) 553-9100

EXISTING LAND USE:
LAND USE: EDUCATION FACILITIES
EXISTING ZONING: "PS" (PUBLIC AND SEMI-PUBLIC)

PROPOSED LAND USE:
MULTIPLE-FAMILY RESIDENTIAL (RM-20)

ASSESSORS PARCEL NUMBER:
244-092-30

EXISTING EASEMENTS:
THE FOLLOWING TITLE INFORMATION WAS DERIVED FROM A PRELIMINARY REPORT ISSUED BY FIRST AMERICAN TITLE COMPANY, ORDER NUMBER OSA-6402869 (MHP) AMENDED NOVEMBER 17, 2020

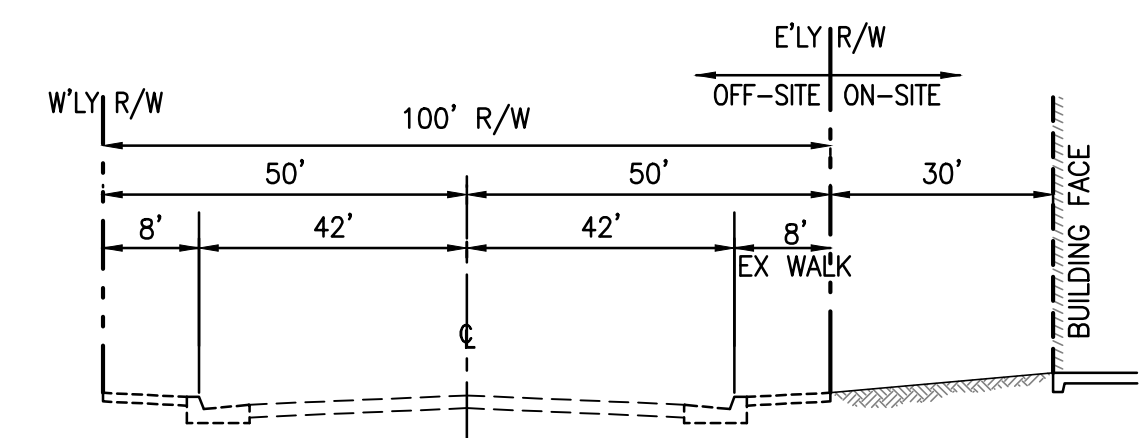
③ AN EASEMENT FOR POWER LINES AND INCIDENTAL PURPOSES, RECORDED JULY 30, 1968 AS INSTRUMENT NO. 21199 IN BOOK 8675, PAGE 469 OF OFFICIAL RECORDS

PROPOSED EASEMENTS:
[A] INDICATES AN EASEMENT FOR PEDESTRIAN WALKWAY PURPOSE

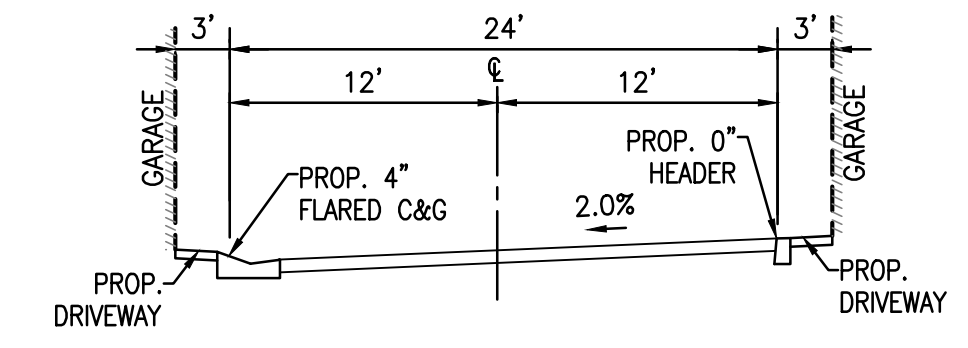
- LEGEND:**
- AP ANGLE POINT
 - ASPH ASPHALT PAVEMENT
 - BC BUILDING CORNER
 - BEG BEGIN
 - BO BLOW-OFF VALVE
 - BLDG BUILDING
 - BW BLOCK WALL
 - CB CATCH BASIN
 - CF CURB FACE
 - CLF CHAIN LINK FENCE
 - CMF CORRUGATED METAL FENCE
 - CONC CONCRETE PAVEMENT
 - DI DRAIN INLET
 - DWY DRIVEWAY
 - FH FIRE HYDRANT
 - GM GAS METER
 - LS LANDSCAPING
 - MH MANHOLE
 - PKWY PARKWAY
 - P/L PROPERTY LINE
 - RET RETAINING
 - ROW RIGHT-OF-WAY
 - SFH SINGLE-FAMILY HOME
 - ST LT STREET LIGHT
 - TE TEMPORARY
 - TF TRANSFORMER
 - WF WOOD FENCE
 - WL WALL
 - WM WATER METER
 - V VALVE
- SYMBOLS:**
- BO BLOW-OFF VALVE
 - DI DRAIN INLET
 - FH FIRE HYDRANT
 - ⊙ LIGHT STANDARD
 - ⊙ STORM DRAIN MANHOLE
 - ⊙ SANITARY SEWER MANHOLE
 - ⊙ SIGN POST
 - ⊙ GM GAS METER
 - ⊙ WM WATER METER
 - ⊙ V UTILITY VALVE
 - UTILITY/POWER POLE
 - == BLOCK/RETAINING SCREEN WALL
 - == BLOCK/RETAINING LOW WALL
 - == PLANTER/DECORATIVE WALL
 - OVERHEAD WIRE
 - EDGE OF ASPHALT PAVEMENT
 - WOOD/WROUGHT IRON FENCE
 - CHAIN LINK FENCE
 - DIRECTION OF FLOW
 - 9.3 MINOR CONTOUR (1' INTERVAL)
 - 100 MAJOR CONTOUR (5' INTERVAL)
 - ×91.5 SPOT ELEVATION

PREPARED FOR: OWNER/DEVELOPER MELIA HOMES 8951 RESEARCH DRIVE, #100 IRVINE, CA 92618 (949) 759-4367	PREPARED BY: C&V CONSULTING, INC. 9830 IRVINE CENTER DRIVE IRVINE, CALIFORNIA 92618 (949) 916-3800 INFO@CVC-INC.NET WWW.CVC-INC.NET	CITY OF CYPRESS DEPARTMENT OF PUBLIC WORKS TENTATIVE TRACT NO. 19147 CITRUS SQUARE - SENIOR COMMUNITY CYPRESS, CALIFORNIA TENTATIVE MAP	PROJECT NO. MELA-007 SHEET 1 OF 4
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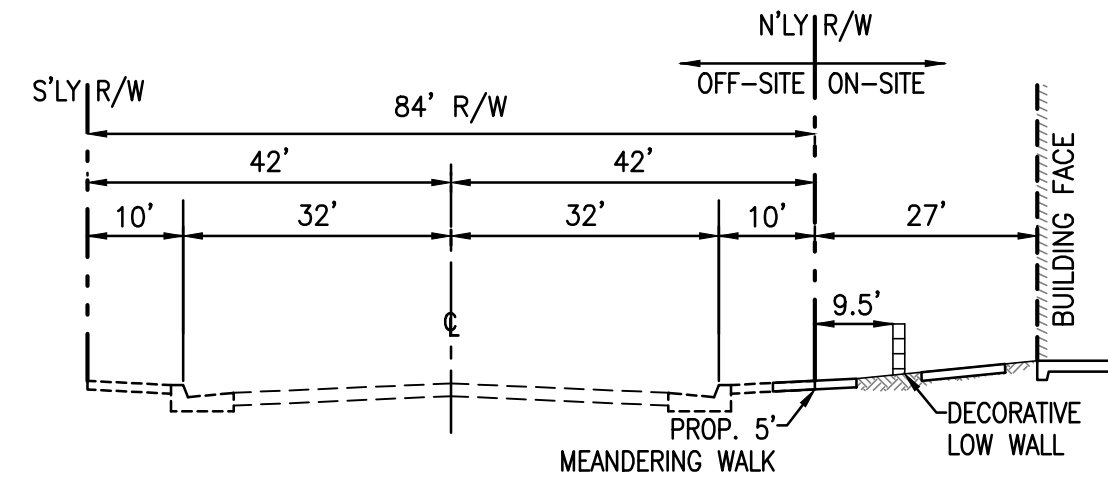




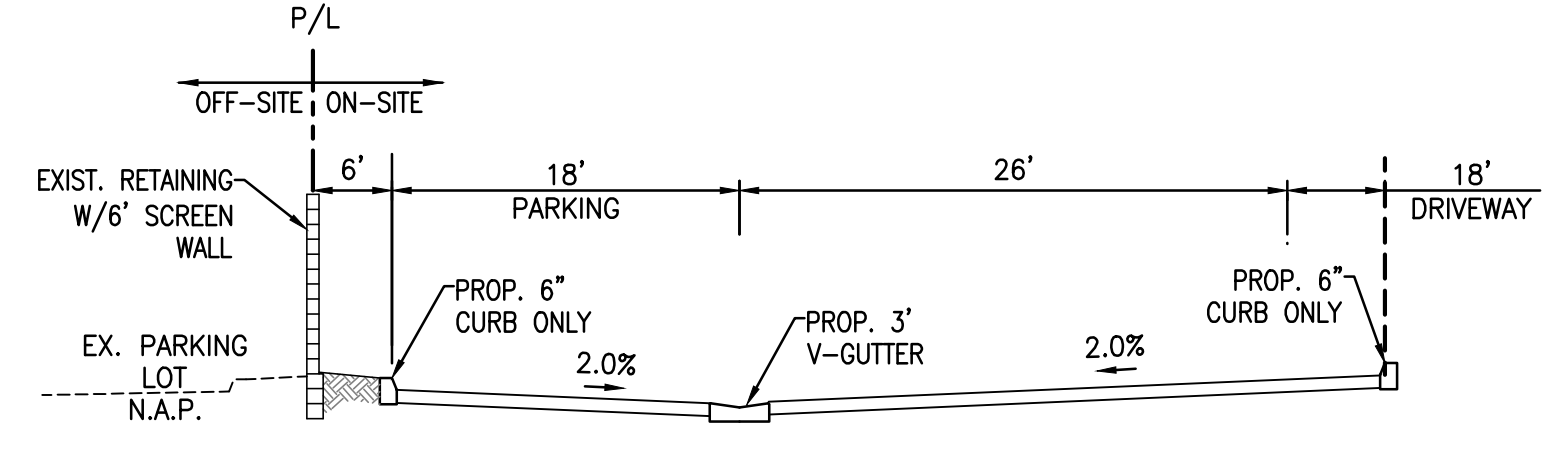
**SECTION A-A
MOODY STREET**
NOT TO SCALE



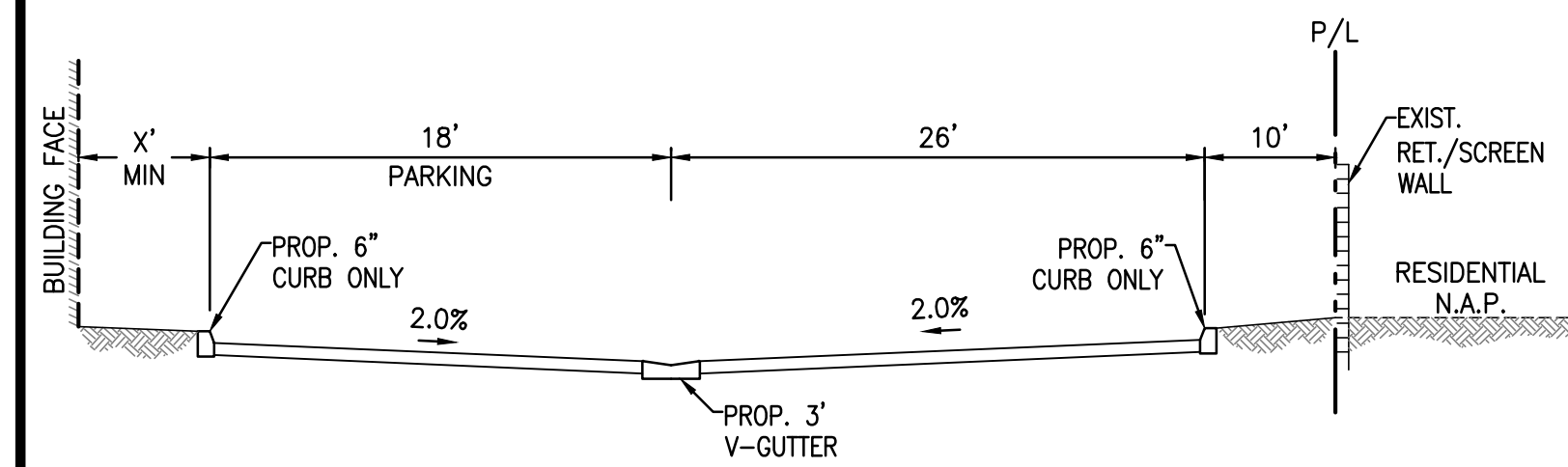
**SECTION B-B
24' INTERIOR COURT**
NOT TO SCALE



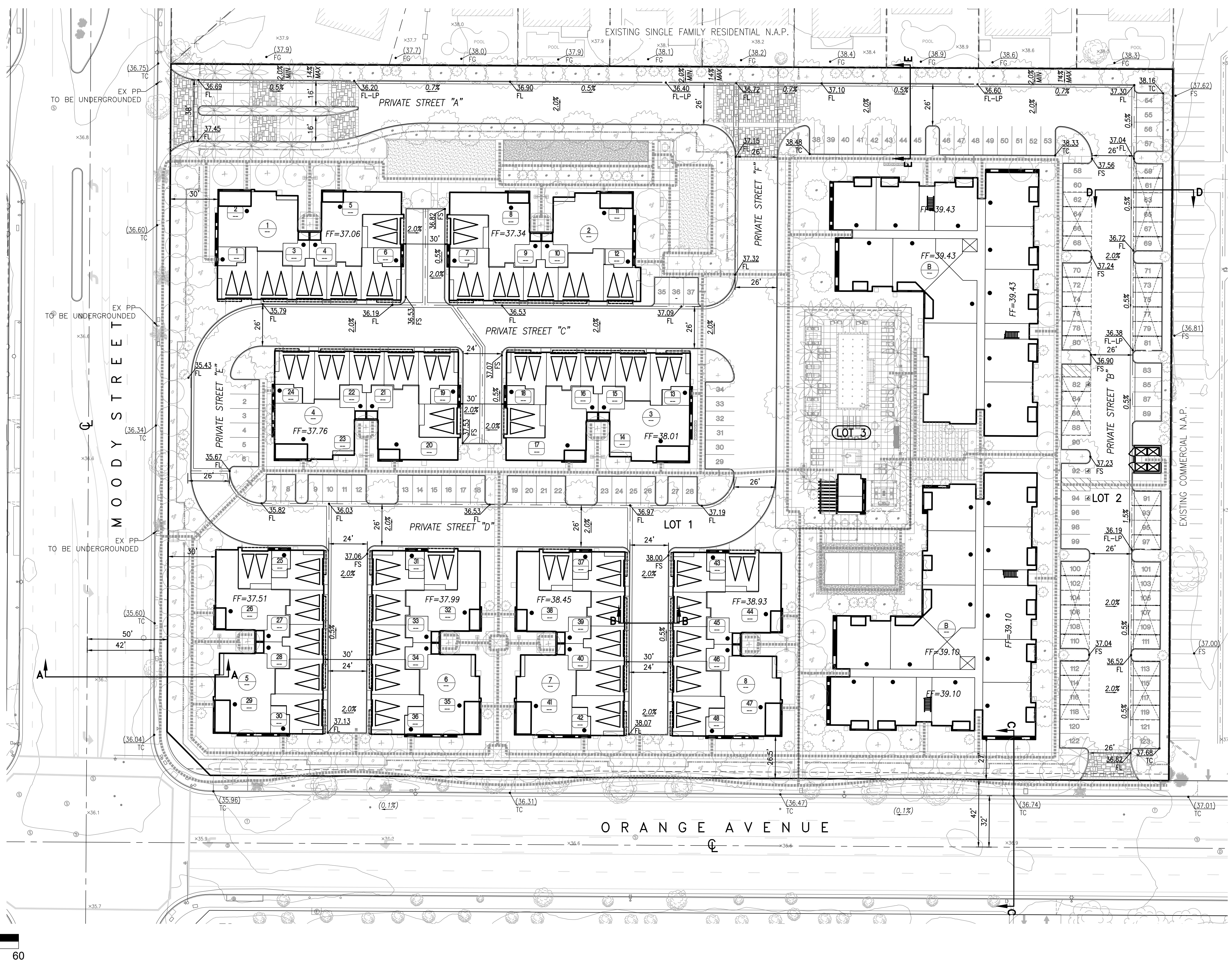
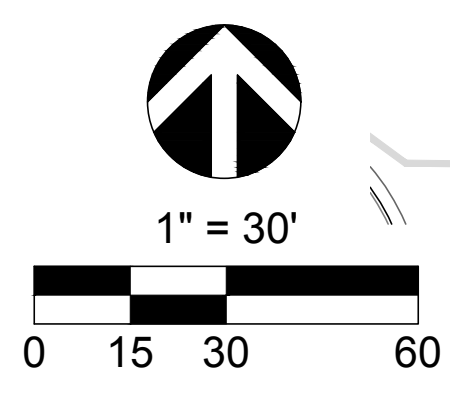
**SECTION C-C
ORANGE AVENUE**
NOT TO SCALE



**SECTION D-D
E'LY BOUNDARY WALL**
NOT TO SCALE



**SECTION E-E
N'LY BOUNDARY WALL**
NOT TO SCALE



REVISIONS		
REV	DATE	DESCRIPTION

PREPARED FOR:
OWNER/DEVELOPER

MELIA HOMES
8951 RESEARCH DRIVE, #100
IRVINE, CA 92618
(949) 759-4367

PREPARED BY:

C&V CONSULTING, INC.
9830 IRVINE CENTER DRIVE
IRVINE, CALIFORNIA 92618
(949) 916-3800
INFO@CVC-INC.NET
WWW.CVC-INC.NET

REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
C 80705

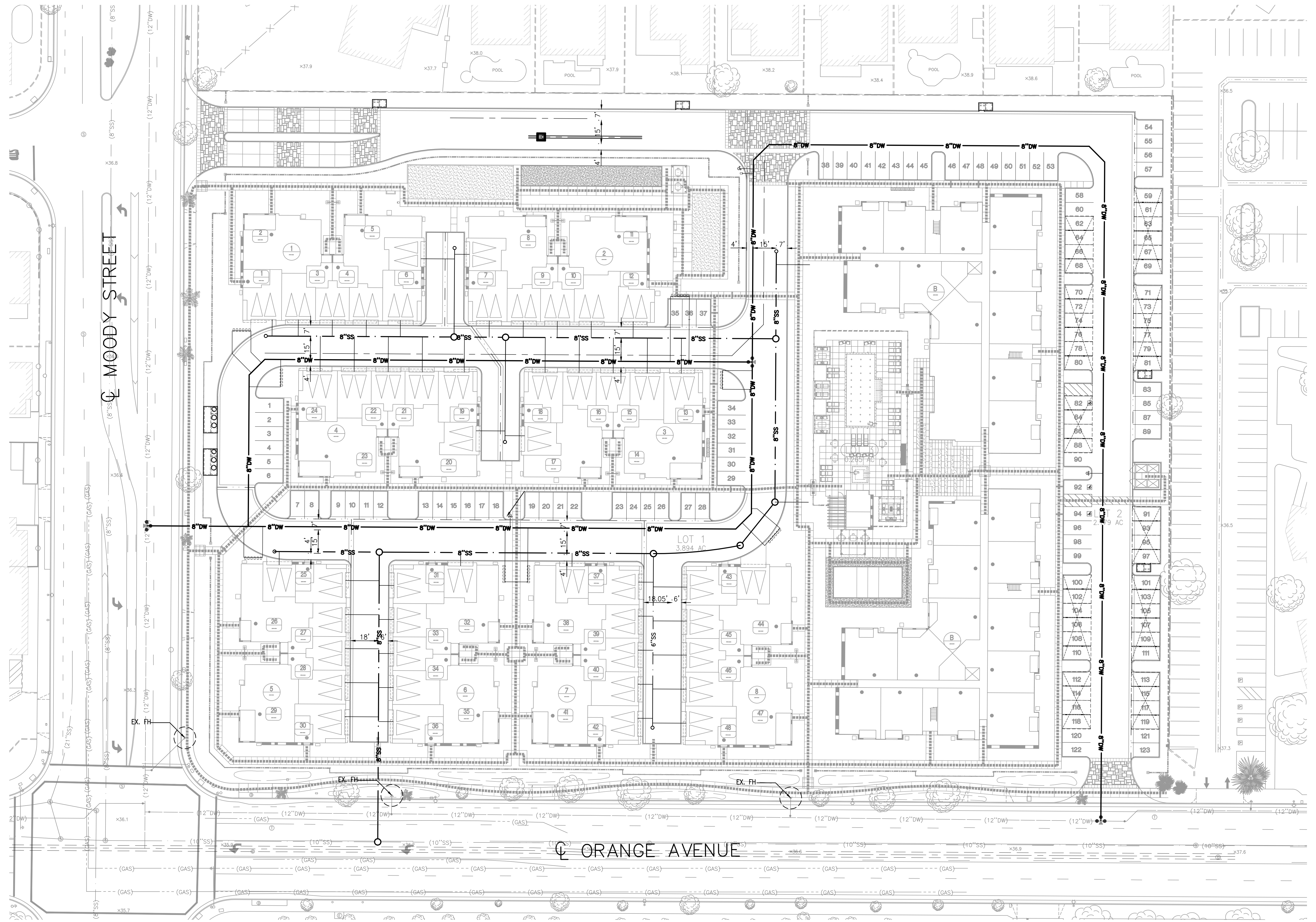
CITY OF CYPRESS
DEPARTMENT OF PUBLIC WORKS

TENTATIVE TRACT NO. 19147
CITRUS SQUARE - SENIOR COMMUNITY
CYPRESS, CALIFORNIA

PRELIMINARY GRADING PLAN

PROJECT NO.
MELA-007

SHEET
2
OF
4



PREPARED FOR:
OWNER/DEVELOPER

MH MELIA HOMES
8951 RESEARCH DRIVE, #100
IRVINE, CA 92618
(949) 759-4367

PREPARED BY:

C&V CONSULTING, INC.
6830 IRVINE CENTER DRIVE
IRVINE, CALIFORNIA 92618
(949) 916-3800
INFO@CVC-INC.NET
WWW.CVC-INC.NET

REGISTERED PROFESSIONAL ENGINEER
DANNIE P. MCCOY
C 80705
CIVIL
STATE OF CALIFORNIA

CITY OF CYPRESS
DEPARTMENT OF PUBLIC WORKS

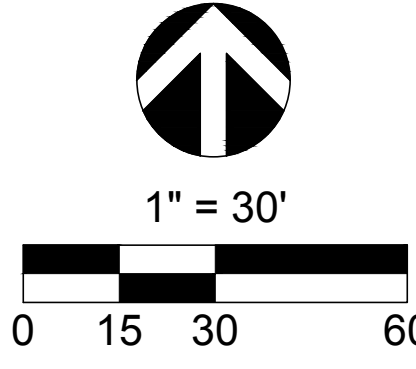
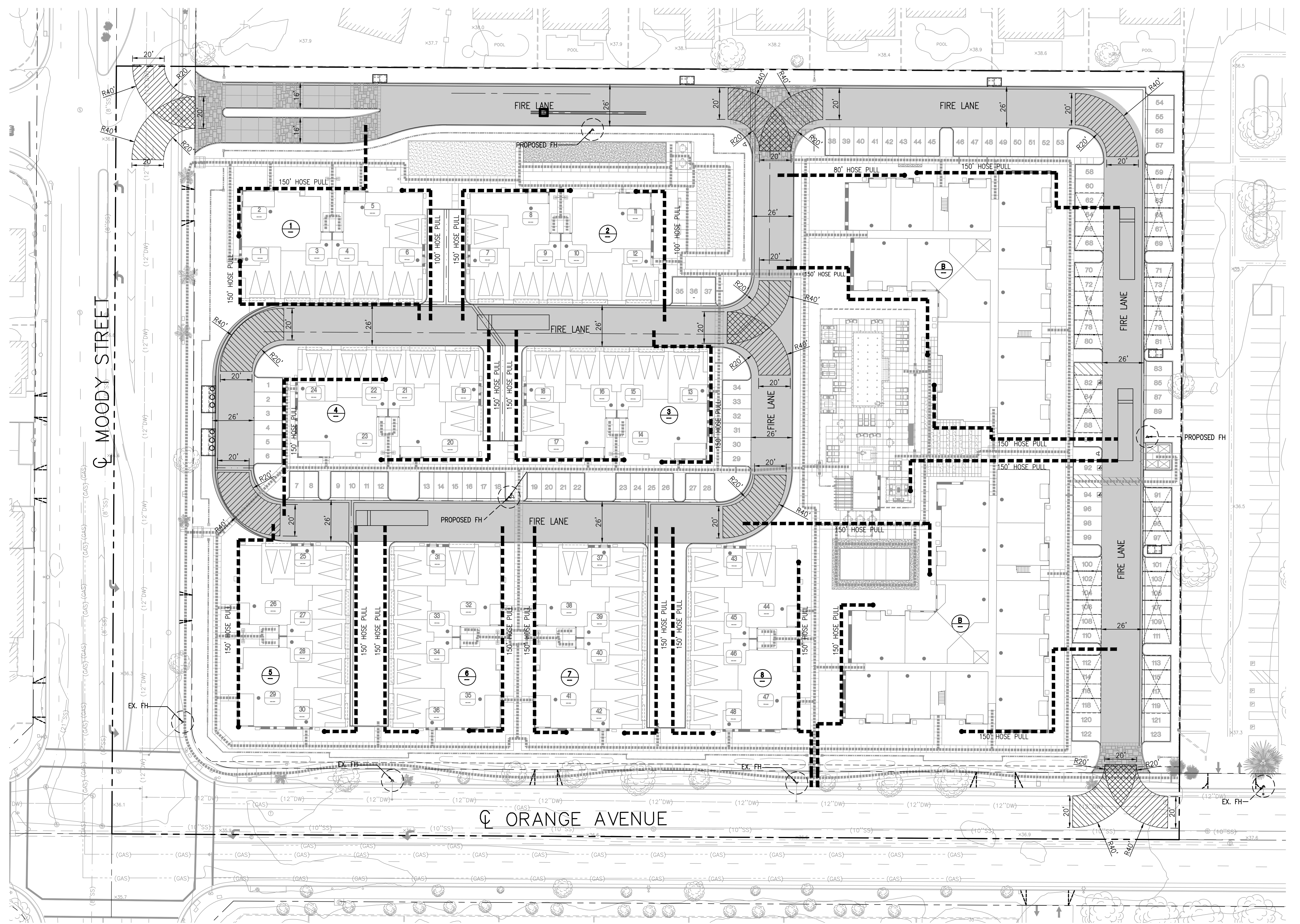
TENTATIVE TRACT NO. 19147
CITRUS SQUARE - SENIOR COMMUNITY
CYPRESS, CALIFORNIA

UTILITY SHEET

PROJECT NO.
MELA-007

SHEET
3
OF
4

PLANNING & DESIGN
DATE: 10/27/2021



PROJECT SUMMARY:

NET AREA: ± 6.34 ACRES
 TOTAL UNITS: 98 HOMES
 • (48) 2-STORY MARKET-RATE TOWNS
 • (50) 2-STORY AFFORDABLE TOWNS
 NET DENSITY: 15.5 HOMES PER ACRE

PREPARED FOR:
OWNER/DEVELOPER

MELIA HOMES
 8951 RESEARCH DRIVE, #100
 IRVINE, CA 92618
 (949) 759-4367

PREPARED BY:

C&V CONSULTING, INC.
 9830 IRVINE CENTER DRIVE
 IRVINE, CALIFORNIA 92618
 (949) 916-3800
 INFO@CVC-INC.NET
 CIVIL ENGINEERING
 LAND PLANNING & SURVEYING
 WWW.CVC-INC.NET

REGISTERED PROFESSIONAL ENGINEER
 DANIEL P. MCCOY
 C 80705
 CIVIL
 STATE OF CALIFORNIA

CITY OF CYPRESS
 DEPARTMENT OF PUBLIC WORKS

TENTATIVE TRACT NO. 19147
 CITRUS SQUARE - SENIOR COMMUNITY
 CYPRESS, CALIFORNIA

PRELIMINARY FIRE ACCESS & HYDRANT LOCATION PLAN

PROJECT NO.
MELA-007

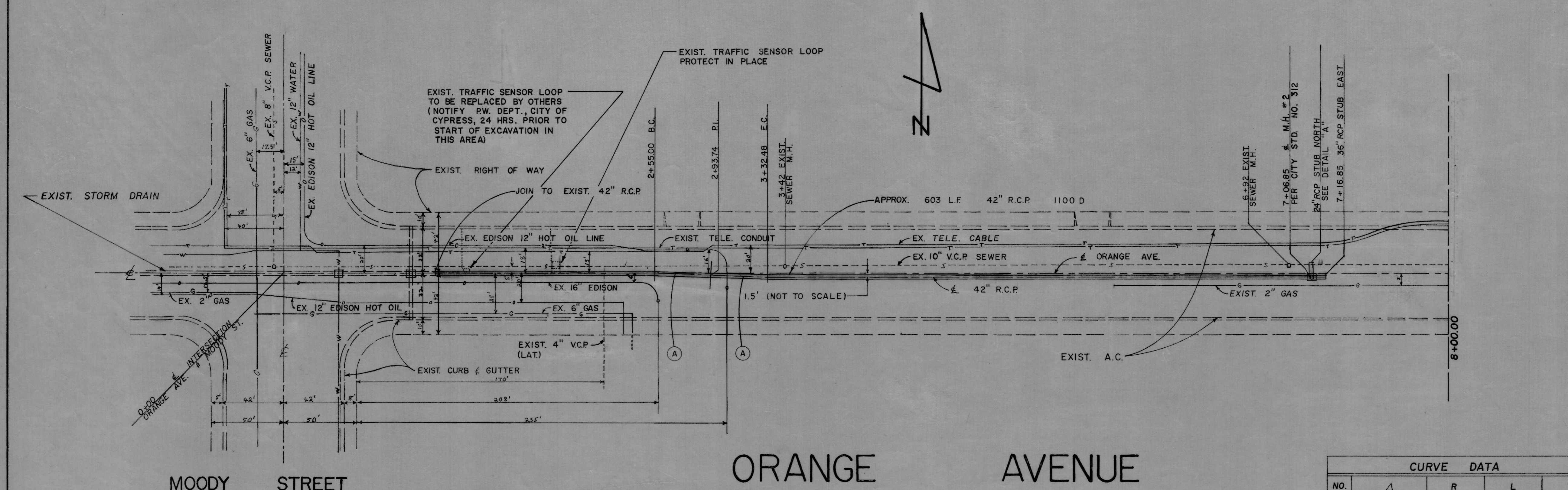
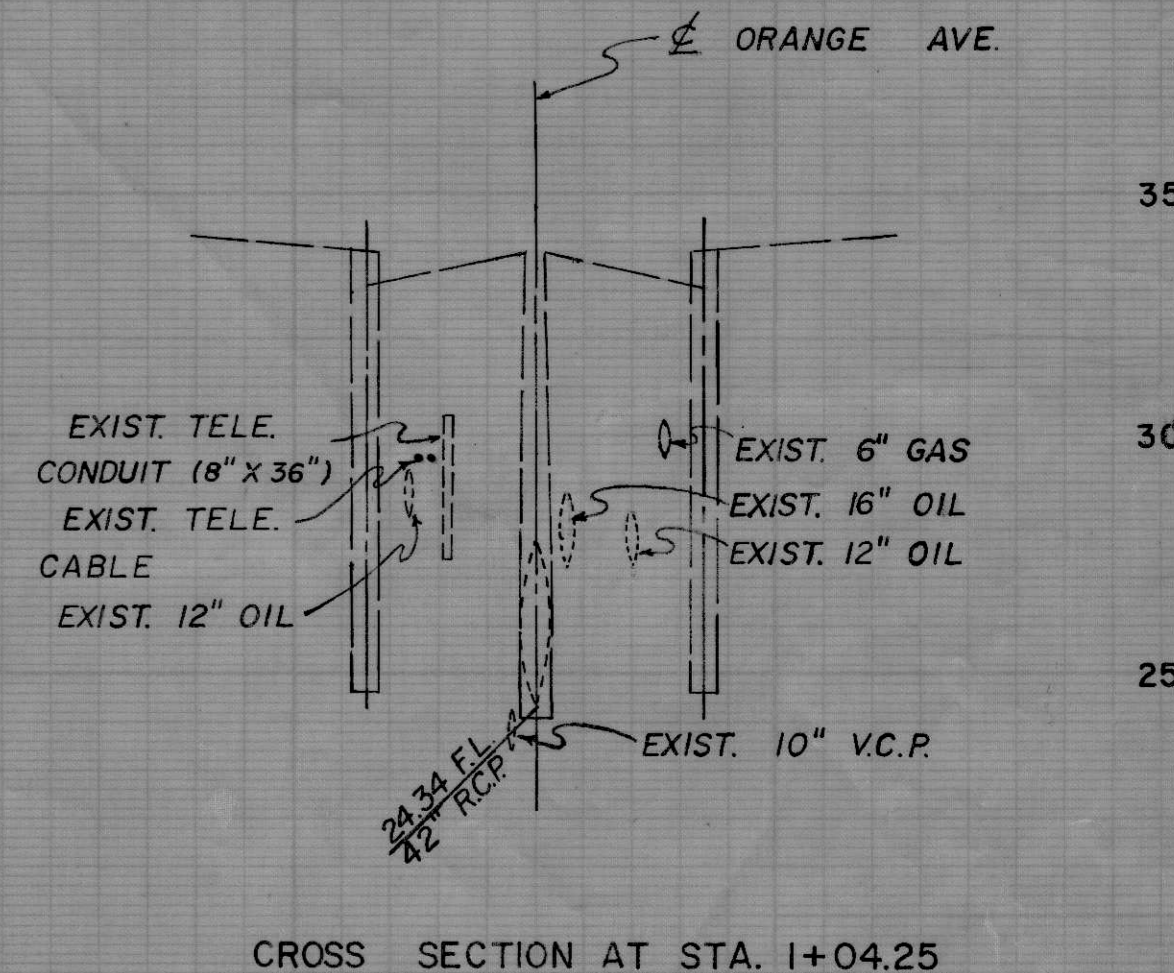
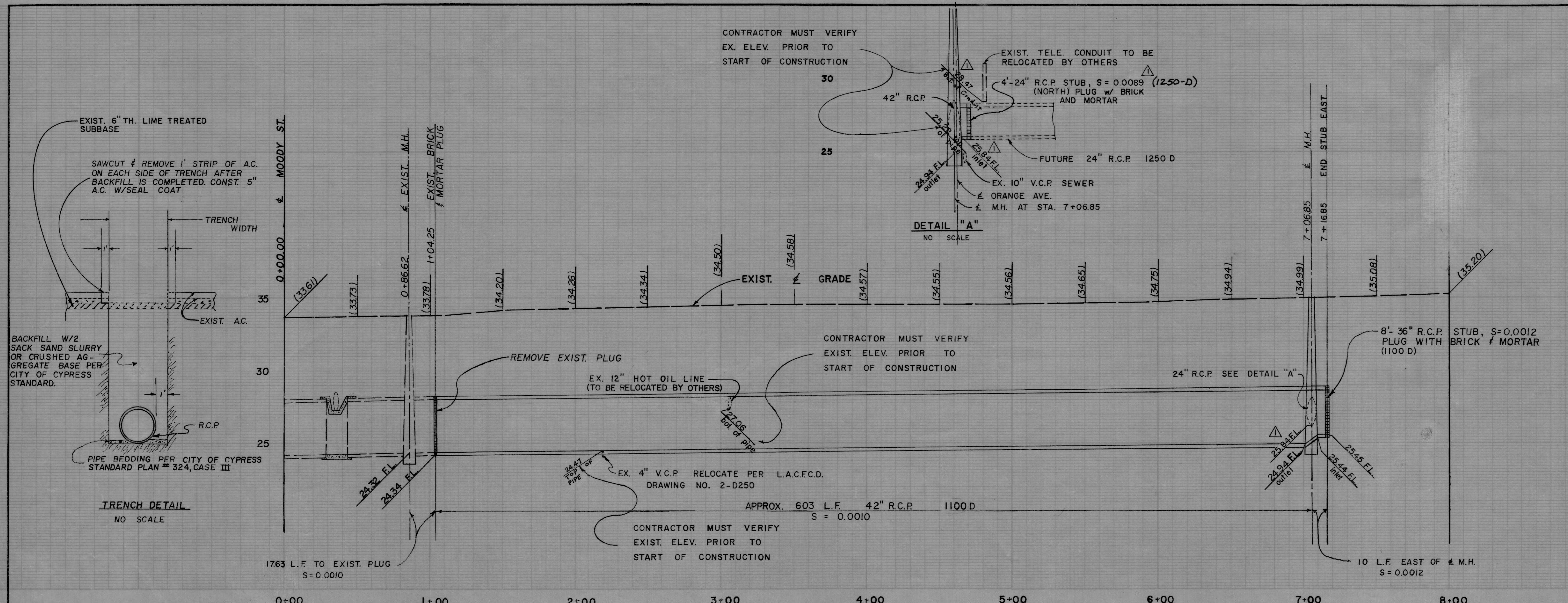
SHEET
4
OF
4

DATE: 10/19/2021

City of Cypress Storm Drain As-Builts

ESTIMATE OF QUANTITIES - ALT. NO. 1

ITEM	DESCRIPTION	QUANTITY
1	EXCAVATION	1222 C.Y.
2	42" R.C.P. 1100 D	603 L.F.
3	36" R.C.P. 1100 D	8 L.F.
4	24" R.C.P. 1250 D	4 L.F.
5	M.H. No. 2 Per City of Cypress Std. Plan No. 312	1 EA.
6	RELOCATE 4" V.C.P.	L. S.
7	BACKFILL C.A.B. or 2 Sack Slurry	1092 C.Y.
8	ASPHALT CONCRETE PAVEMENT	157 TONS
9	SEAL COAT	0.2 TONS
10	BRICK AND MORTAR PLUG	2 EA.



- GENERAL NOTES**
- ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF CYPRESS STANDARD PLANS AND SPECIFICATIONS PER CYPRESS STANDARD PLAN NO. 99 AND SHALL BE CONSIDERED A PART OF THESE PLANS AND ARE ATTACHED HERETO AND A PART HEREOF.
 - THE EXISTENCE AND LOCATION OF UTILITY STRUCTURES AND FACILITIES ARE SHOWN ON THESE PLANS OR IN THE SPECIAL PROVISIONS ACCORDING TO THE RECORDS AND INFORMATION AVAILABLE TO THE CITY AND UTILITY COMPANIES. ATTENTION IS CALLED TO THE POSSIBLE EXISTENCE OF OTHER UTILITY FACILITIES OR STRUCTURES NOT KNOWN TO THE CITY OR IN A LOCATION DIFFERENT FROM THAT SHOWN ON THESE PLANS OR IN SPECIAL PROVISIONS. THE CONTRACTOR IS REQUIRED TO ASCERTAIN THE LOCATION OF ALL UNDERGROUND UTILITY STRUCTURES AND FACILITIES, INCLUDING THOSE NOT SHOWN OR INTERFERE WITH THEIR SERVICE AND TO TAKE SUCH PRECAUTIONARY MEASURES IN THE COURSE OF SAID WORK TO PREVENT SUCH DAMAGE OR INTERFERENCE.

CURVE DATA

NO.	Δ	R	L	T
(A)	2° 13' 12"	1000'	41.306'	19.376'

REVISIONS

No.	Date	Initials	Description
1	12-5-74	WJM	REVISED FLOWLINE ELEV. OF 24" R.C.P. STUB

REFERENCES

Bench Mark: ORANGE AVE. AND MOODY ST. INTERSECTION, NORTHEAST CORNER, SOUTHERLY B.C.R., T.C. ELEV. 33.85, FL. ELEV. 33.08

Plans: Field Book: 8 PG. 10129

SCALES

HORIZ: 1" = 40'
VERT: 1" = 4'

DESIGNED BY: WJM DATE: 8/74
DRAWN BY: J.S. DATE: 8/74
CHECKED BY: WJM DATE: 9/74

APPROVALS

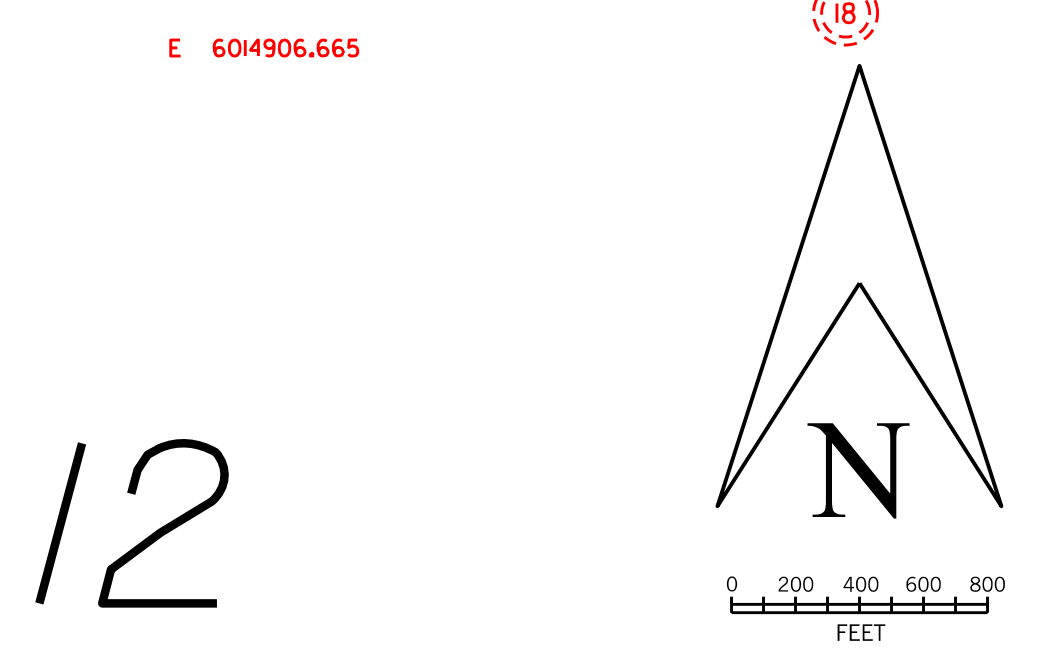
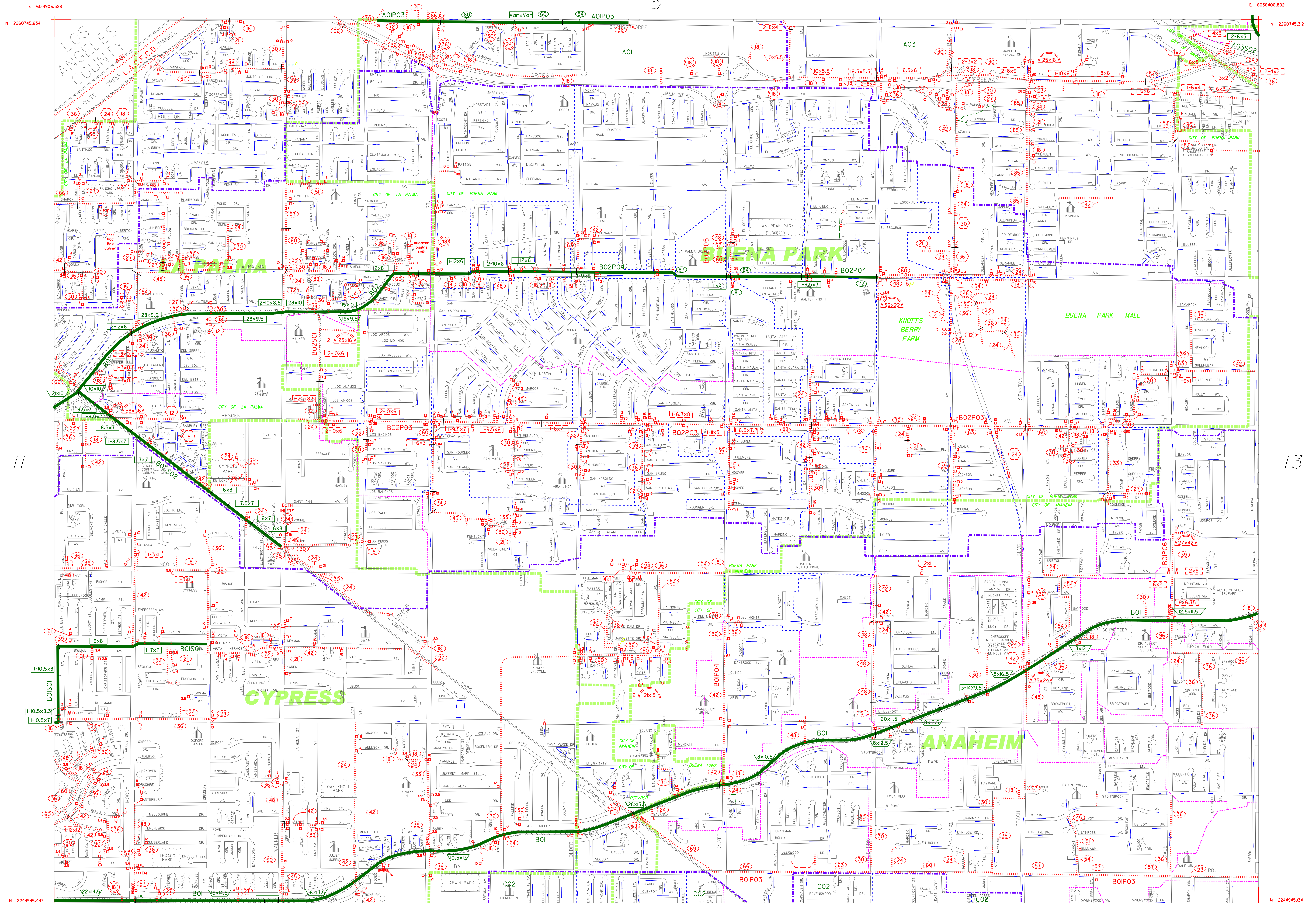
DIVISION OR SECTION	BY	DATE
DESIGN	WJM	9/74
SUBDIVISION	J.S.	9/74
TRAFFIC	J.S.	9/74
RIGHT-OF-WAY	J.S.	9/74
RECOMMENDED	J.S.	9/74
APPROVED:	City Engineer	9/74

ALTERNATE BID NO. 1
2-A-6 STORM DRAIN
CITY OF CYPRESS
DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE FOR THE CONSTRUCTION OF
ORANGE AVE. - STORM DRAIN
FROM MOODY ST. TO GRINDLAY ST.

SHEET 1 OF 2
PROJECT NO. 7517-20
FILE NO.

Orange County Drainage Facility Maps



NOTICE

The drainage information has been prepared for information purposes only. The location, ownership, facility information and limits have been determined from available information provided by public agencies, but may not be exact, accurate, or up-to-date. The user of this information is responsible for verifying exact location, ownership, accuracy, and the regional versus local character of drainage facilities.

Additional information may be obtained from public plans and recorded deeds. Facility designations included with this information are for convenience only and are not controlling or intended to imply ownership by the County or the Orange County Flood Control District (OCFCD). The information is being provided as a courtesy and neither the County of Orange nor OCFCD assume any liabilities for inaccuracy of the information.

To notify OC Public Works Flood Control Section of additions or corrections, please contact Sal Gutierrez at (714) 647-3992 or by email at sal.gutierrez@ocpw.ocgov.com

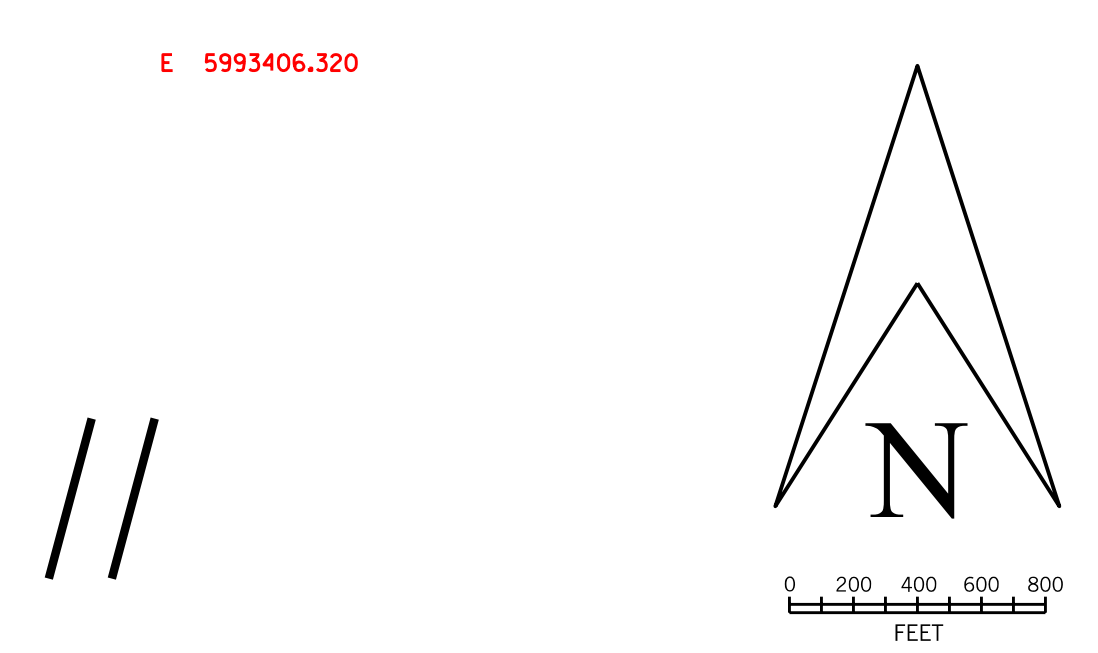
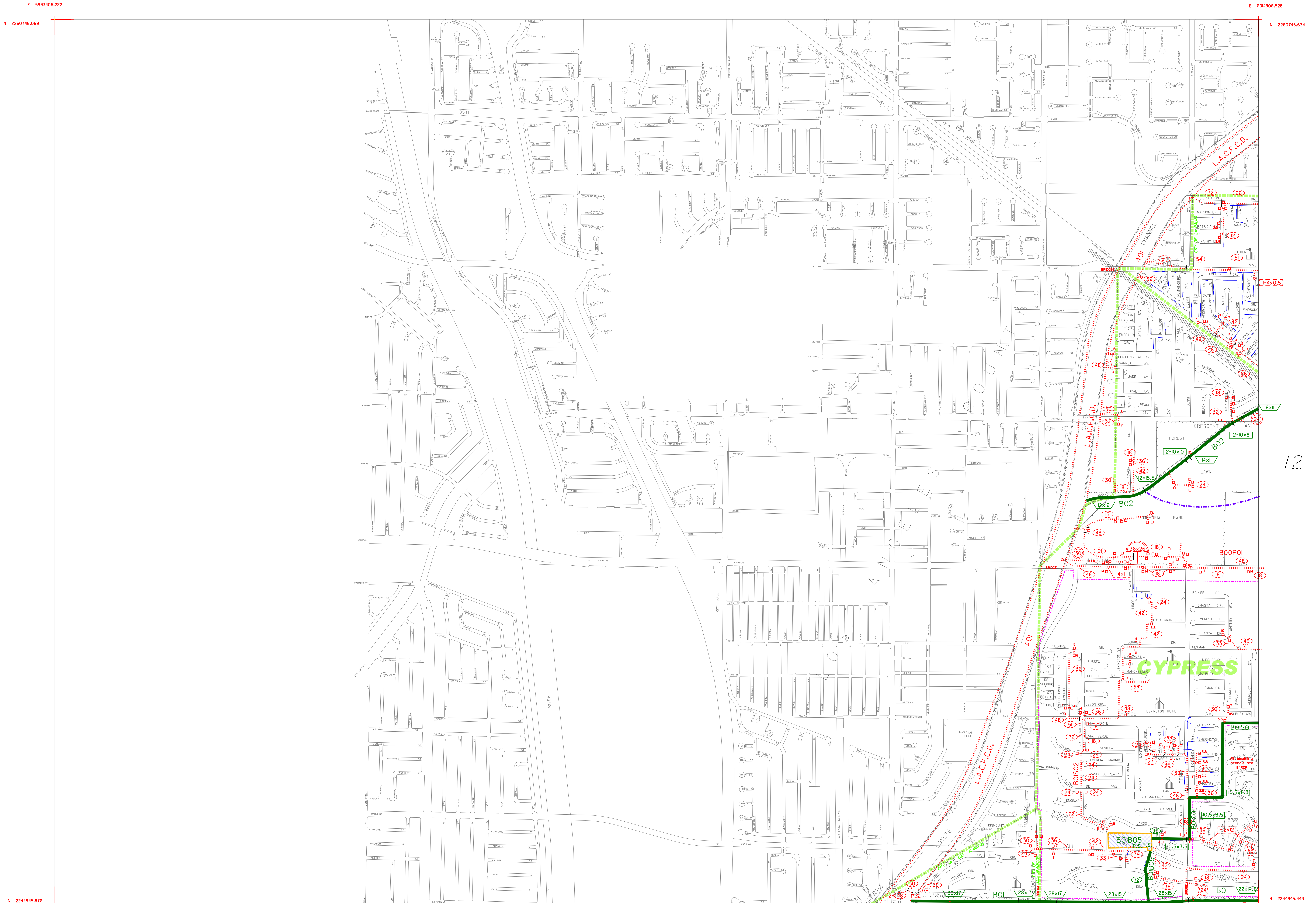
ORANGE COUNTY FLOOD CONTROL DISTRICT			
BASE MAP OF DRAINAGE FACILITIES IN ORANGE COUNTY			
REVISION	DATE	SHEET NO.	DWG. NO.
S. GUTIERREZ	APR 23, 2012	12	MAPS-113-3

- Channel Drainage Area Boundary
 - Major Sub-Area Drainage Boundary
 - Minor Sub-Area Drainage Boundary
 - Existing O.C.F.C.D. Facility
 - Existing Local Facility
 - Existing Retarding Basin or Reservoir
 - Natural Watercourse
 - City Limits
 - Greenbelt
 - Pump Station
 - Catch Basin (length in feet)
 - Drop Inlet or Other Entry
 - OCFCD Basins or Reservoirs
- Ownership: (If other than City or County): Private = P State = S Federal = F

- EXISTING FACILITIES**
- O.C.F.C.D. LOCAL
- Earth Trapezoidal Channel (base width by height in feet)
 - Reinforced Concrete Trapezoidal Channel (base width by height in feet)
 - Reinforced Concrete Rectangular Channel (base width by height in feet)
 - Reinforced Concrete Box (RCB) (number of bays-span by height in feet)
 - Reinforced Concrete Pipe (RCP) (diameter in inches)
 - Metal Sheet Channel (MSC) (base width by pile height in feet, Sheet pile total length)
 - Corrugated Metal Pipe (CMP) (diameter in inches)
 - Concrete Pipe (diameter in inches)
 - Concrete Oval Pipe (width by height in inches)
 - Steel Pipe (diameter in inches)
 - Reinforced Concrete Arch (base span by height in inches)
 - Corrugated Metal Arch (base span by height in inches)

12

12



NOTICE

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To notify OC Public Works Flood Control Section of additions or corrections, please contact Sal Gutierrez at (714) 834-5396 or by email at sal.gutierrez@ocpw.ocgov.com

ORANGE COUNTY FLOOD CONTROL DISTRICT			
BASE MAP OF DRAINAGE FACILITIES IN ORANGE COUNTY			
REVISION S. GUTIERREZ	DATE OCT. 1, 2007	SHEET NO. II	DWG. NO. MAPS-113-3

EXISTING FACILITIES	
	Channel Drainage Area Boundary
	Major Sub-Area Drainage Boundary
	Minor Sub-Area Drainage Boundary
	Existing O.C.F.C.D. Facility
	Existing Local Facility
	Existing Retarding Basin or Reservoir
	Natural Watercourse
	City Limits
	Greenbelt
	Pump Station
	Catch Basin (length in feet)
	Drop Inlet or Other Entry
	OCFCD Basins or Reservoirs
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	Earth Trapezoidal Channel (base width by height in feet)
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	Metal Sheet Channel (MSC) (base width by pile height in feet-Sheet pile total length)
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	Concrete Pipe (diameter in inches)
	Concrete Oval Pipe (width by height in inches)
	Steel Pipe (diameter in inches)
	Reinforced Concrete Arch (base span by height in inches)
	Corrugated Metal Arch (base span by height in inches)

12

18