Plotnik & Associates

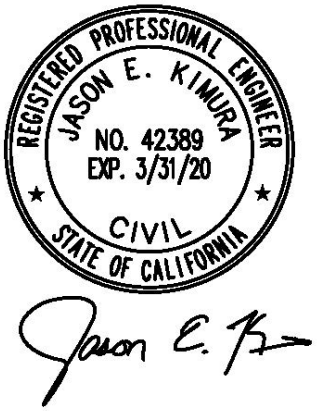
CONCEPTUAL DRAINAGE STUDY

FOR

NORTH COR. AGUA MANSA RD. & HALL AVE.

JURUPA VALLEY, CA 92518

CASE # MA 18008



Job No. 450.00

February 3, 2020

18626 S. Wilmington Ave., Ste. 100 • Rancho Dominguez, CA 90220 • 310-605-6657 • 310-605-6658 Fax

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PROJECT DESCRIPTION

The project site is located on the northeast side of Hall Avenue and on the northwest side of Agua Mansa Road. The site consists of approximately 23.4 acres. The existing site is vacant with no improvements. Two industrial/commercial buildings along with associated parking, truck docking and maneuvering areas and landscaping is proposed to be constructed on this site. The site currently sheet flows south and east to Hall Avenue and Agua Mansa Road. The storm water then flows into a storm drain system constructed for PM 24088 and PM 12104 (approved in 1992, drawing number I-514) which flows south on Agua Mansa Road, south and east on Brown Avenue, discharging into the Santa Ana River. See Attachment A.

PROPOSED DESIGN

Drainage from the northwest portion of the site (Area A) will be directed to a proposed infiltration basin at the north end of the development (see preliminary WQMP). Storm runoff from 85th percentile events will percolate into the ground. Runoff in excess of this amount will overflow into a storm drain riser and flow into a relocated storm drain pipe which connects to the Riverside County Flood Control District's (RCFCD) system in Hall Avenue. The existing 39" reinforced concrete pipe (RCP) storm drain which crosses the site carries drainage from the development to the northeast (Inland Empire Cold Storage site) and a portion of adjacent residential lots on the south side of El Rivino Road. The location of this 39" RCP conflicts with the proposed building layout and will be relocated to the northwest by approximately 235 feet. The proposed pipe size will be increased to a 42" RCP since 39" RCP is not typically available.

Drainage from the southwest portion of the site (Area B) will be directed to underground infiltration chambers (see preliminary WQMP) beneath the proposed truck apron. Storm runoff from the 85th percentile events will percolate into the ground. Runoff in excess of this amount will overflow into two existing 24" storm drain laterals which connects to the RCFCD's 51" RCP storm drain in Hall Avenue.

A storm drain line is being constructed in El Rivino Road from 200 feet west of Cactus Avenue to Agua Mansa Road in the County of San Bernardino. This storm drain takes a large portion of the offsite tributary outlined in the drainage study dated 11/1/90 by Willdan Associates for the storm drain system constructed for PM 24088 and PM 12104. A copy of the Willdan Assocaites hydrology map is enclosed as Attachment B. A proposed catch basin on the south side of El Rivino Road will be constructed with this project and coordinated with the County of San Bernardino and City of Jurupa Valley.

This study will calculate the runoff from the offsite areas (Inland Empire Cold Storage site and adjacent residential area) entering the RCFCD's 39" storm drain (and proposed relocated 42" storm drain) as well as calculate the site runoff from the proposed development to show that the proposed flow into the RCFCD's storm drain will not exceed the storm drain's designed capacity.

HYDROLOGY METHODOLOGY

The Rational Method per the Riverside County Flood Control and Water Conservation District Hydrology Manual was used for this study.

HYDROLOGIC ANALYSIS

A 100 year analysis was done using the Rational Method. See page 9. The resultant flowrate from areas OS1, OS2 and A at Node 1 is 41.77 cfs. The storm drain plans constructed for PM 24088, and PM 12104 shows a corresponding flowrate of 58.4 cfs. The proposed design will be below the designed flowrate at this point by approximately 17 cfs.

The resultant flowrate from areas OS1, OS2, A and B at Node 2 is 56.43 cfs. The storm drain plans constructed for PM 24088, and PM 12104 shows a corresponding flowrate of 71.1 cfs. The proposed design will be below the designed flowrate at the south end of Hall Avenue by approximately 15 cfs.

Flow from Area B (14.66 cfs) will be split to enter the Brown Avenue Storm Drain at the existing laterals at stations 55+45.99 and 58+80.02. Designed flows for the two laterals are 9.6 cfs and 11.0 cfs, respectively. The proposed flow into each lateral is 7.33 cfs.

Area C will be graded but remain undeveloped but analyzed as a commercial development for this report. A low point in the middle of the area will collect runoff with a proposed storm drain pipe taking the flow to the existing 24" lateral on the west side of Agua Mansa Road. This lateral has been designed to accept a 100 year flow of 22.1 cfs. The proposed 100 year runoff from Area C is 7.69 cfs, well below the design flowrate.

See Site Hydrology Map on page 3.

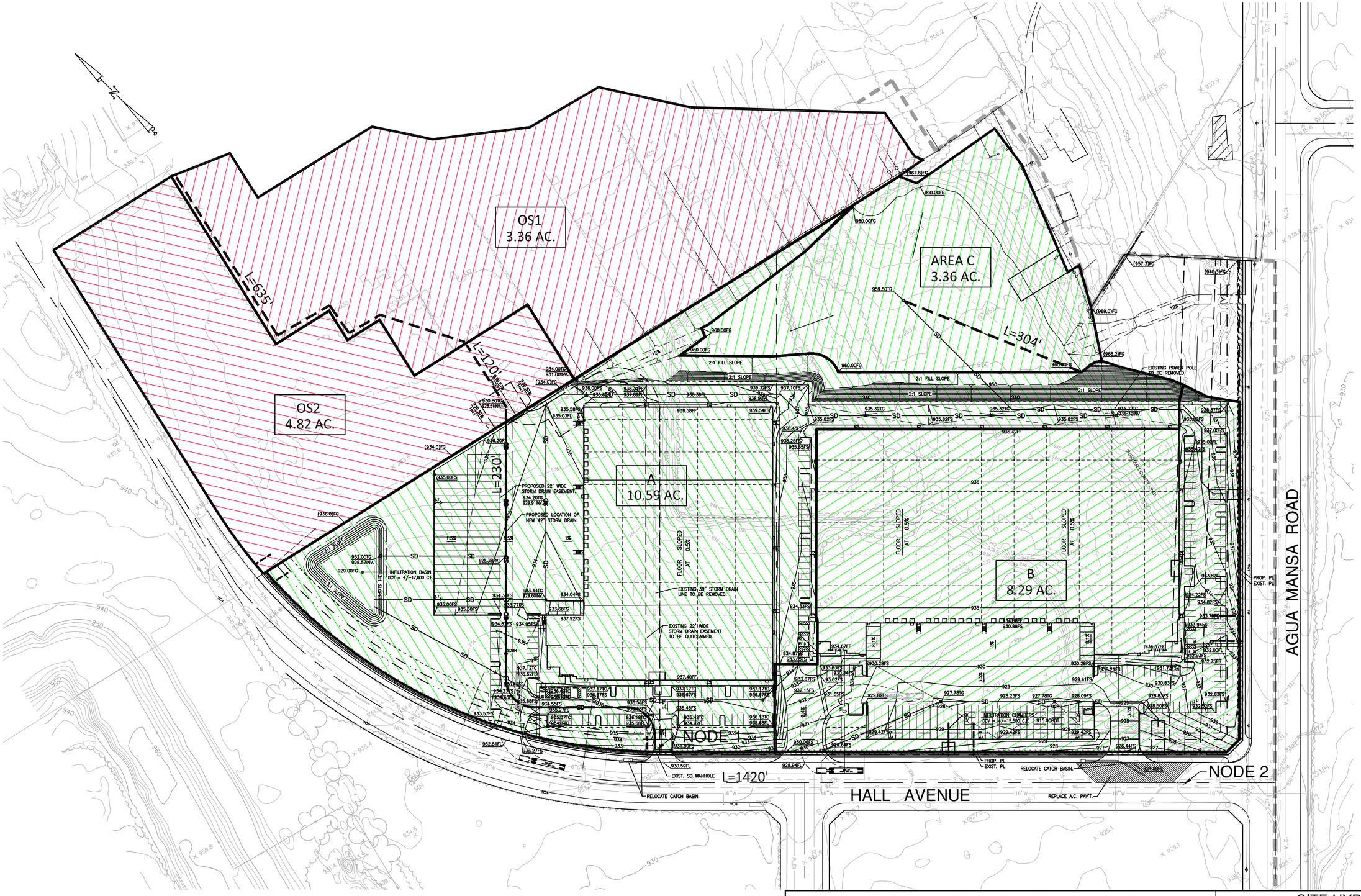
Tributary	Area (Ac.)	Q_{100} (cfs)	Drainage Solution
OS1	7.29	12.03	Surface flow to inlet leading to RCFCD's 39" RCP storm drain (to be relocated).
OS2	4.82	9.42	Surface flow to infiltration area. Overflow to RCFCD's 39" storm drain (to be relocated).
A	10.59	20.32	Site drainage to catch basins & storm drains to infiltration basin. Overflow to RCFCD's 39" storm drain (to be relocated).
B	8.29	14.66	Site drainage to catch basins & underground infiltration chambers. Overflow to RCFCD's 51" RCP in Hall Road.
C	3.36	7.69	Surface flow to inlet leading to existing 24" lateral connecting RCFCD's 30" RCP in Agua Mansa Road.

CONCLUSION

The site lies within the drainage tributary for the storm drain system constructed for PM 24088 and PM 12104. Storm drain discharge from the site is less than design flow rates at all discharge points.

PROJECT SUMMARY TABLE

Flow Description	Q_{100}
EXISTING FLOW FROM SITE	29.5 CFS
PROPOSED FLOW FROM SITE	35.0 CFS
DESIGNED FLOW FROM SITE	58.0 CFS



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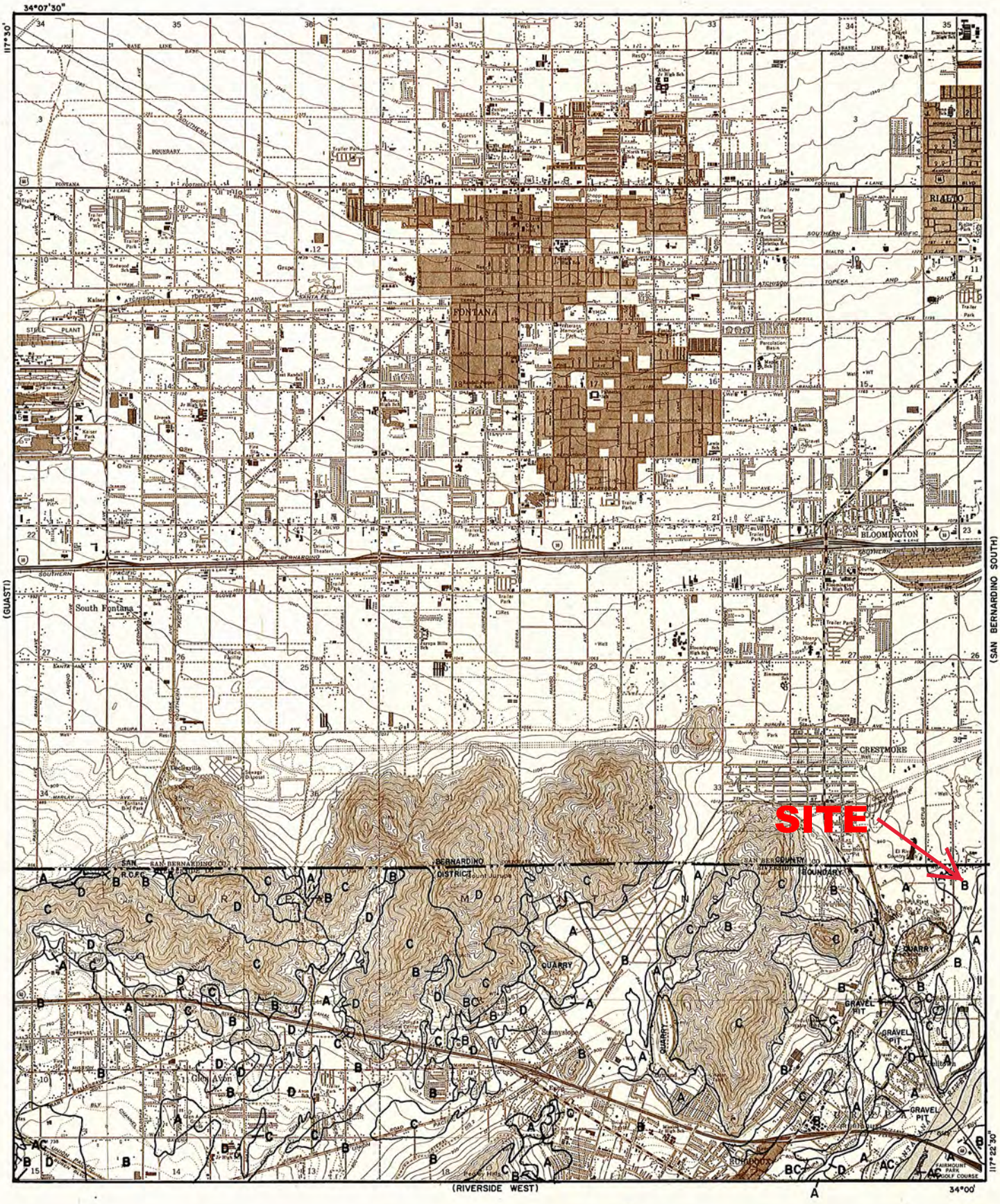
www.plotnik.com

SITE HYDROLOGY MAP
NE COR. HALL AVE. & AGUA MANSA RD.

SCALE:	1"= 120'	DATE:	2/3/20
BY:	JEK	JOB NO.:	450.00



LEGEND

—— SOILS GROUP BOUNDARY

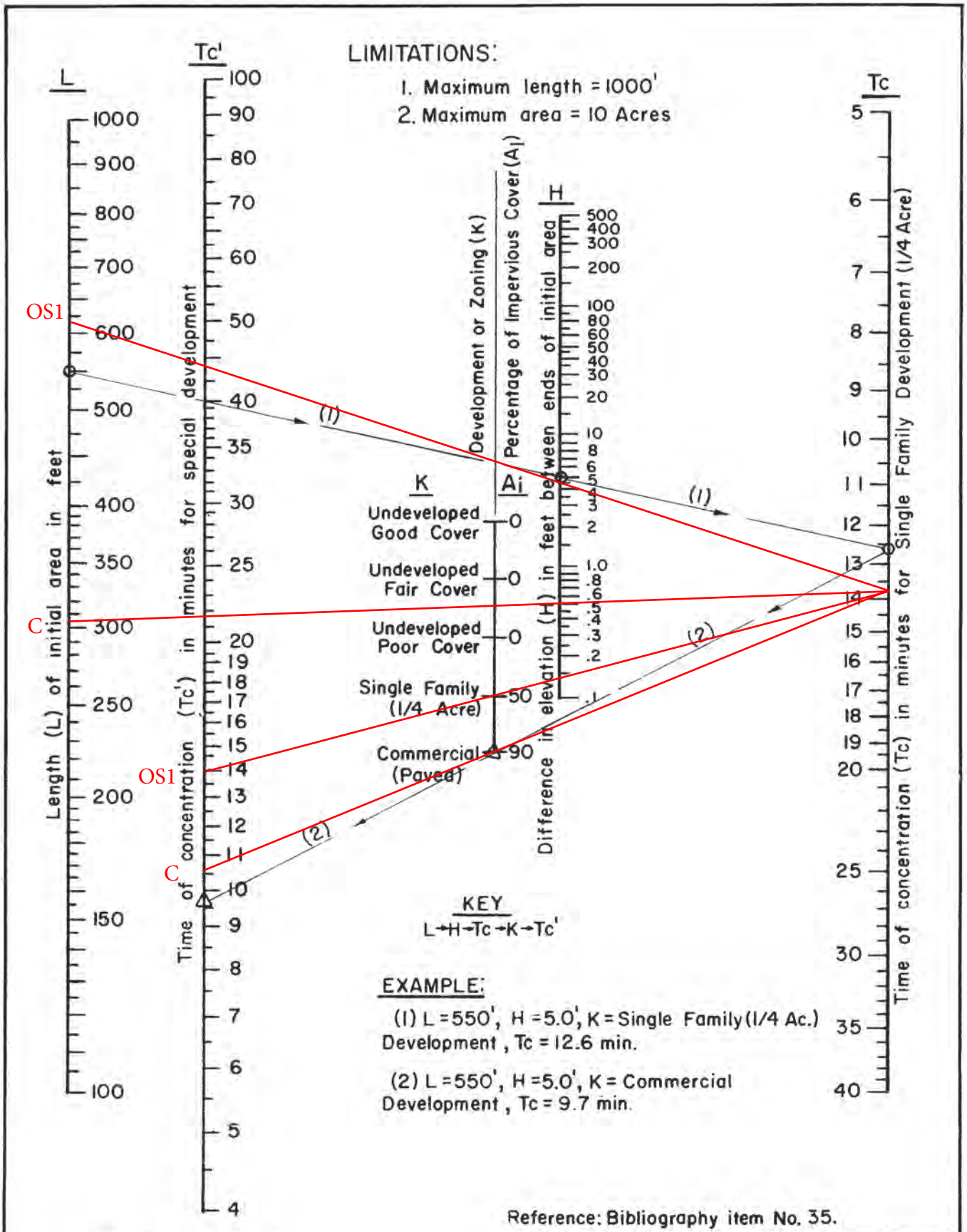
A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR FONTANA



Reference: Bibliography item No. 35.

RCFC & WCD
HYDROLOGY MANUAL

TIME OF CONCENTRATION
FOR INITIAL SUBAREA

PLATE D-3

RAINFALL INTENSITY–INCHES PER HOUR

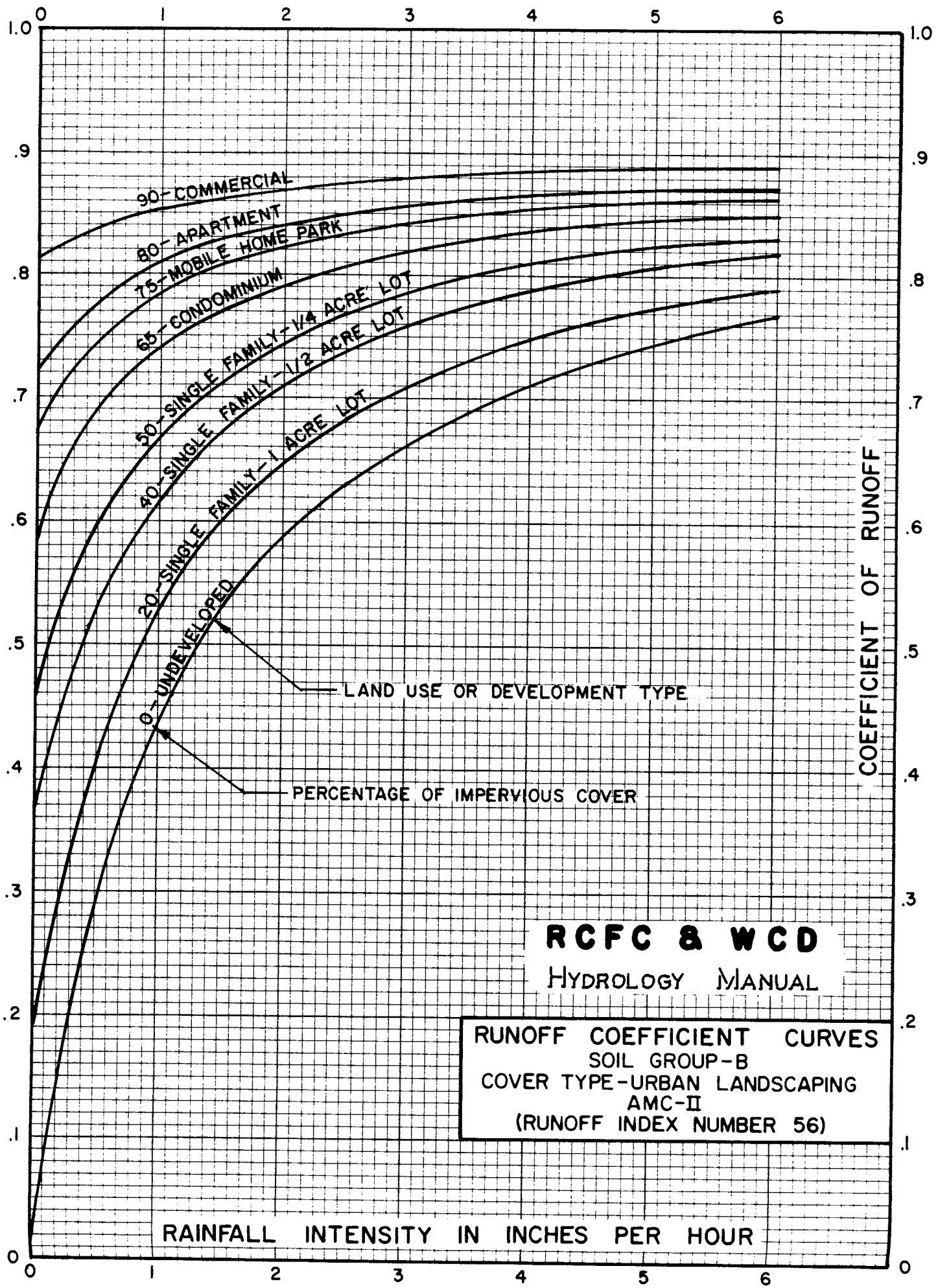
RIVERSIDE			RIVERSIDE (FOOTHILL AREAS)			RUBIDOUX			SAN JACINTO			SUN CITY		
DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR	DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	2.75	3.92	5	3.14	4.71	5	3.18	4.71	5	2.81	4.16	5	3.25	4.85
6	2.48	3.55	6	2.84	4.26	6	2.87	4.26	6	2.56	3.79	6	2.95	4.40
7	2.28	3.26	7	2.61	3.91	7	2.64	3.91	7	2.37	3.51	7	2.72	4.06
8	2.12	3.03	8	2.42	3.63	8	2.45	3.63	8	2.22	3.29	8	2.53	3.78
9	1.99	2.84	9	2.27	3.41	9	2.30	3.41	9	2.09	3.10	9	2.38	3.55
10	1.88	2.68	10	2.14	3.21	10	2.17	3.21	10	1.98	2.94	10	2.25	3.36
11	1.78	2.54	11	2.03	3.05	11	2.06	3.05	11	1.89	2.80	11	2.14	3.19
12	1.70	2.42	12	1.94	2.91	12	1.96	2.91	12	1.81	2.68	12	2.04	3.05
13	1.62	2.32	13	1.86	2.78	13	1.88	2.78	13	1.74	2.58	13	1.96	2.92
14	1.56	2.23	14	1.78	2.67	14	1.80	2.67	14	1.68	2.48	14	1.88	2.81
15	1.50	2.14	15	1.71	2.57	15	1.74	2.57	15	1.62	2.40	15	1.81	2.71
16	1.45	2.07	16	1.66	2.48	16	1.68	2.48	16	1.57	2.32	16	1.75	2.62
17	1.40	2.00	17	1.60	2.40	17	1.62	2.40	17	1.52	2.25	17	1.70	2.54
18	1.36	1.94	18	1.55	2.33	18	1.57	2.33	18	1.48	2.19	18	1.65	2.46
19	1.32	1.88	19	1.51	2.26	19	1.52	2.26	19	1.44	2.13	19	1.60	2.39
20	1.28	1.83	20	1.46	2.20	20	1.48	2.20	20	1.40	2.08	20	1.56	2.33
22	1.22	1.74	22	1.39	2.08	22	1.41	2.08	22	1.34	1.98	22	1.48	2.21
24	1.16	1.66	24	1.32	1.99	24	1.34	1.99	24	1.28	1.90	24	1.41	2.11
26	1.11	1.58	26	1.27	1.90	26	1.28	1.90	26	1.23	1.82	26	1.36	2.03
28	1.06	1.52	28	1.22	1.82	28	1.23	1.82	28	1.19	1.76	28	1.30	1.95
30	1.02	1.46	30	1.17	1.76	30	1.19	1.76	30	1.15	1.70	30	1.26	1.88
32	.99	1.41	32	1.13	1.70	32	1.14	1.70	32	1.11	1.64	32	1.21	1.81
34	.96	1.37	34	1.09	1.64	34	1.11	1.64	34	1.08	1.59	34	1.18	1.76
36	.93	1.32	36	1.06	1.59	36	1.07	1.59	36	1.05	1.55	36	1.14	1.70
38	.90	1.29	38	1.03	1.54	38	1.04	1.54	38	1.02	1.51	38	1.11	1.66
40	.87	1.25	40	1.00	1.50	40	1.01	1.50	40	.99	1.47	40	1.08	1.61
45	.82	1.17	45	.94	1.41	45	.95	1.41	45	.94	1.39	45	1.01	1.51
50	.77	1.11	50	.88	1.33	50	.90	1.33	50	.89	1.31	50	.96	1.43
55	.73	1.05	55	.84	1.26	55	.85	1.26	55	.85	1.25	55	.91	1.36
60	.70	1.00	60	.80	1.20	60	.81	1.20	60	.81	1.20	60	.87	1.30
65	.67	.96	65	.77	1.15	65	.78	1.15	65	.78	1.15	65	.83	1.25
70	.64	.92	70	.73	1.10	70	.74	1.10	70	.75	1.11	70	.80	1.20
75	.62	.88	75	.71	1.06	75	.72	1.06	75	.72	1.07	75	.77	1.15
80	.60	.85	80	.68	1.02	80	.69	1.02	80	.70	1.04	80	.75	1.12
85	.58	.83	85	.66	.99	85	.67	.99	85	.68	1.01	85	.72	1.08
SLOPE = .550			SLOPE = .550			SLOPE = .550			SLOPE = .500			SLOPE = .530		

RCFC & WCD

HYDROLOGY MANUAL

STANDARD
INTENSITY – DURATION
CURVES DATA

PLATE D-4.1 (5 of 6)



RCFC & WCD

HYDROLOGY MANUAL

RUNOFF COEFFICIENT CURVES
SOIL GROUP-B
COVER TYPE-URBAN LANDSCAPING
AMC-II
(RUNOFF INDEX NUMBER 56)

PLATE D-5.2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT CARSON COMPANIES - AGUA MANSA

FREQUENCY 100 YR

Calculated by JEK 2/3/20 DATE

Checked by PC 2/3/20 DATE

DRAINAGE AREA	Soil & Development	A Acres	I in/hr.	C	ΔQ CFS	Σ Q CFS	SLOPE	SECTION	v FPS	L FT.	T MIN.	Σ T	REMARKS
OS1	B-RES. 1 DU/AC	7.29	2.22	0.75	12.03				H=4.4'	635'	14.1	14.1	Initial Area
						12.03					0	14.1	
OS2	B-COM.	4.82	2.22	0.88	9.42	21.45		39" RCP	6.5	230	0.5	14.6	
A	B-COM.	10.59	2.18	0.88	20.32	41.77			10.5*	1,420	2.3	16.9	Other tributaries to the
B	B-COM.	8.29	2.01	0.88	14.66	56.43							main line storm drain were
													omitted as they are not
													relevant to the site
													hydrology.
													*Maximum velocity in this
													segment of pipe per storm
													drain plans (I-514).
C	B-COM.	3.36	2.60	0.88	7.69				H=0.5	304	10.6	10.6	Initial Area

ATTACHMENT A

STORM DRAIN PLANS FOR PM 24088 & PM 12104

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

STORM DRAIN IMPROVEMENT PLANS FOR PARCEL MAP 24088 AND PARCEL MAP 12104 (SAN BERNARDINO COUNTY)

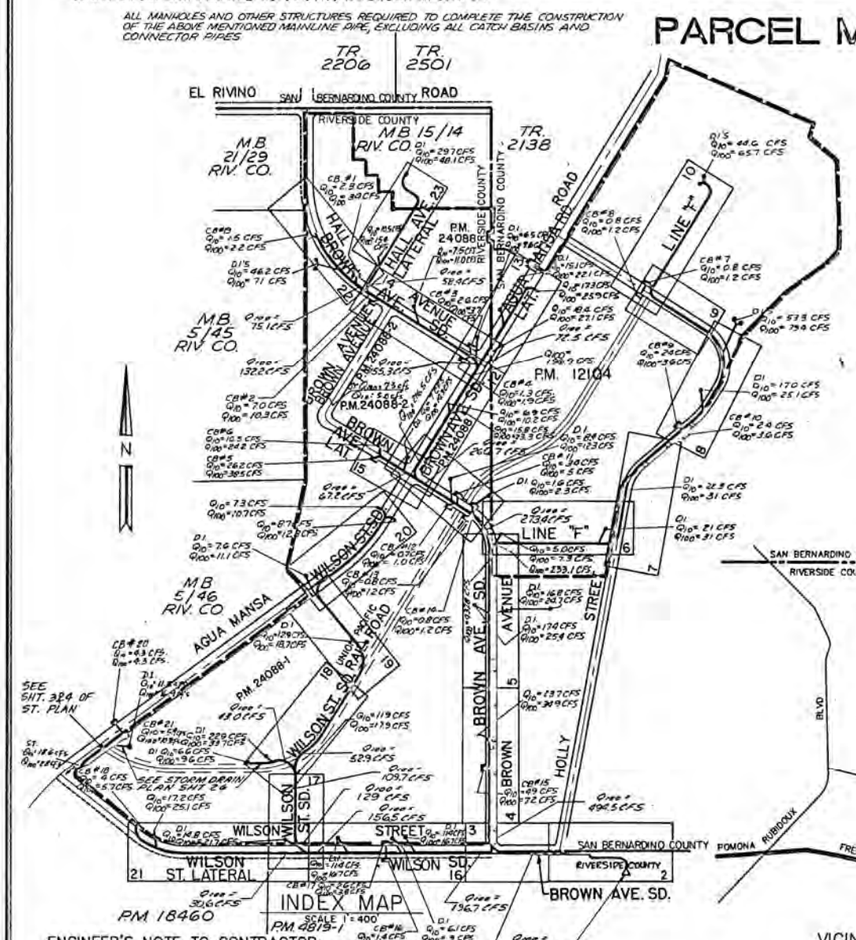
SPECIAL NOTES

THE FOLLOWING ITEMS ARE TO BE INSPECTED AND MAINTAINED BY RIVERSIDE CO FLOOD CONTROL AND WATER CONSERVATION DISTRICT:

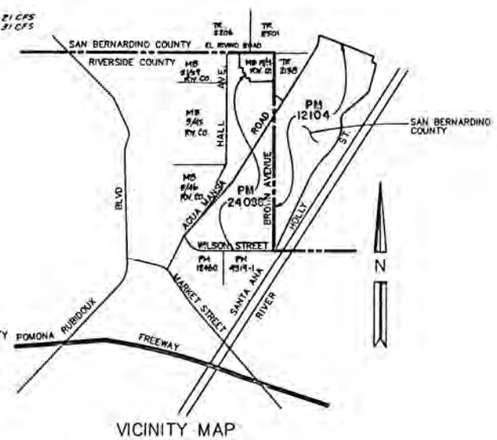
78" RCP FROM STA 4+19.00 TO 11+47.05 AS SHOWN ON SHT 2
66" RCP FROM STA 11+52.05 TO 15+32.05 AS SHOWN ON SHT 2/3
78" RCP FROM STA 15+48.85 TO 21+57.57 AS SHOWN ON SHT 3/4
75" RCP FROM STA 7+45.12 TO 36+36.47 AS SHOWN ON SHT 4/5
66" RCP FROM STA 10+15.76 TO 15+69.15 AS SHOWN ON SHT 5/6
66" RCP FROM STA 36+59.62 TO 44+80.57 AS SHOWN ON SHT 5/11
60" RCP FROM STA 15+79.26 TO 23+27.55 AS SHOWN ON SHT 14/17
54" RCP FROM STA 44+92.37 TO 53+68.86 AS SHOWN ON SHT 11/12
54" RCP FROM STA 23+45.56 TO 30+37.11 AS SHOWN ON SHT 17/18
54" RCP FROM STA 53+80.16 TO 64+39.41 AS SHOWN ON SHT 12
48" RCP FROM STA 10+09.01 TO 12+40.26 AS SHOWN ON SHT 15
48" RCP FROM STA 30+87.81 TO 38+06.63 AS SHOWN ON SHT 18/19
42" RCP FROM STA 63+68.81 TO 66+65.21 AS SHOWN ON SHT 14/22
42" RCP FROM STA 38+15.03 TO 43+88.99 AS SHOWN ON SHT 19
39" RCP FROM STA 1+09.68 TO 9+94.17 AS SHOWN ON SHT 23

SPECIAL NOTE
The concrete cover on the inside of all reinforced concrete pipe must be increased to provide a minimum of 1-1/2" over the reinforcing when the design velocities exceed 20 feet per second. The concrete design strength in these reaches shall be f'_c = 4,000 psi for velocities exceeding 20 feet per second.

ALL MANHOLES AND OTHER STRUCTURES REQUIRED TO COMPLETE THE CONSTRUCTION OF THE ABOVE MENTIONED MAINLINE PIPE, EXCLUDING ALL CATCH BASINS AND CONNECTOR PIPES



INDEX MAP
SCALE 1" = 400'
PM 4819-1



VICINITY MAP
NO SCALE

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S M.O.U. STANDARD SPECIFICATIONS DATED SEPTEMBER 1984, AND DESIGN MANUAL STANDARD DRAWINGS DATED MAY 1971.
2. AN ENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL. CONTACT HOWARD DICKERSON AT (714) 275-1277. AFTER THE PERMIT IS ISSUED, THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
3. CONSTRUCTION INSPECTION WILL BE PERFORMED BY RIVERSIDE COUNTY FLOOD CONTROL. CONTACT LEONARD DUNN AT (714) 275-1288. THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE-CENTERLINE INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-422-4133.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON U.S.C. & G.S. DATUM.

GENERAL NOTES CONTINUED

8. ALL CROSS-SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
9. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
10. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
11. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
12. BEDDING PIPE WITH LESS THAN TWO FEET OF COVER SHALL CONFORM TO LOS ANGELES COUNTY FLOOD CONTROL DISTRICT STANDARD DRAWINGS 2-D213.3 AND 2-D177 FOR CONCRETE BACKFILL IN TRENCHES. ALL OTHER PIPE SHALL CONFORM TO RCFC&WCD STD. DWG. MB15.
13. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED SEPT 16, 1988 BY GEO-ETKA, INC. LOCATIONS SHOWN ARE APPROXIMATE.
14. "V" IS THE DEPTH OF INLET OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
15. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
16. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
17. HYDRAULIC GRADE LINES SHOWN IN PROFILES ARE FOR 100 YEAR FREQUENCY FLOWS, UNLESS OTHERWISE NOTED.
18. THE CONTRACTOR SHALL COMPLY WITH THE STATE AND LOCAL SAFETY CODES DURING THE PROGRESS OF WORK.
19. THE DEVELOPER SHALL MAINTAIN ADJACENT STREETS IN A NEAT, SAFE, CLEAN AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE COUNTY'S OR DISTRICT'S INSPECTOR. THE ADJACENT STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCE BEING CONTROLLED AT ALL TIMES. THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY CLEAN-UP ON ADJACENT STREETS AFFECTED BY HIS CONSTRUCTION. METHOD OF STREET CLEANING SHALL BE BY DRY SWEEPING OF ALL PAVED AREAS.
20. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER, R.C.F.C.D., COUNTY ROAD DEPARTMENT, AND THE DEVELOPER'S ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIBILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNERS, OR THE DEVELOPER'S ENGINEER.
21. ADJUST ALL STORM DRAIN AND SEWER MANHOLES, AND WATER VALVES TO GRADE.
22. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTIONS (NOT TRUE LENGTHS OF PIPE) AND ARE THE BASIS OF THE ESTIMATES OF QUANTITIES. THE CONTRACTOR SHALL DETERMINE THE TRUE QUANTITY OF PIPE REQUIRED FOR THIS PROJECT PRIOR TO PLACING ORDER.
23. ALL ELEVATIONS SHOWN ARE TO THE INVERT OF PIPE, EXCEPT WHERE OTHERWISE NOTED.
24. *THE CONCRETE COVER ON THE INSIDE OF ALL REINFORCED CONCRETE PIPE MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2" OVER THE REINFORCING WHEN THE DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE f'_c = 4,000 PSI FOR VELOCITIES EXCEEDING 20 FPS.*

INDEX

R.C.F.C.D. STANDARD DRAWINGS (P.M. 240 88)

		QUANTITY	UNIT
CB 100	CATCH BASIN NO. 1	15	EA
CB 103	MANHOLE FRAME AND COVER FOR CATCH BASINS	—	—
CB 105	DETAIL OF CATCH BASIN OPENING	—	—
CB 108	INLET TYPE X	19	EA
JS 227	JUNCTION STRUCTURE NO. 2	—	EA
JS 229	JUNCTION STRUCTURE NO. 4	4	EA
MH 251	MANHOLE NO. 1	8	EA
MH 252	MANHOLE NO. 2	16	EA
MH 254	MANHOLE NO. 4	18	EA
MH 255	MANHOLE FRAME AND COVER, NON-ROCKING	—	—
MH 257	MANHOLE SHAFT FOR CAST PIPE	—	—
MH 259	STANDARD DROP STEP	—	—
TS 303	TRANSITION STRUCTURE NO. 3	6	EA
M 803	CONCRETE COLLARS FOR PIPES 12 INCHES THROUGH 66 INCHES	1	—
M 815	BEDDING AND PAY LINES	—	—
M 816	CONCRETE BULKHEAD	14	EA

L.A.C.F.C.D. STANDARD DRAWINGS (P.M. 12104)

2-D102	MANHOLE NO. 1	1	EA
2-D107	CONCRETE RINGS, REDUCER AND PIPE FOR MANHOLE SHAFT	—	—
2-D112	JUNCTION STRUCTURE NO. 2	2	EA
2-D113	MANHOLE NO. 4	2	EA
2-D156	MANHOLE FRAME AND COVER FOR CATCH BASINS	—	—
2-D160	CATCH BASIN NO. 1	4	EA
2-D177	PIPE BEDDING IN TRENCHES	—	—
2-D184	MANHOLE NO. 2	8	EA
2-D193	JUNCTION STRUCTURE NO. 4	1	EA
2-D393	CONCRETE COLLAR FOR PIPES 12 INCHES THROUGH 66 INCHES	—	—
2-D430	MANHOLE SHAFT SAFETY LEDGE	3	EA

CONSTRUCT 84-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	365.33	L.F.
CONSTRUCT 78-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	1220.12	L.F.
CONSTRUCT 75-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	1449.43	L.F.
CONSTRUCT 72-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	750.87	L.F.
CONSTRUCT 69-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	681.08	L.F.
CONSTRUCT 66-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	1368.61	L.F.
CONSTRUCT 60-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	721.24	L.F.
CONSTRUCT 54-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	2698.85	L.F.
CONSTRUCT 51-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	941.39	L.F.
CONSTRUCT 42-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	1086.30	L.F.
CONSTRUCT 39-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	2315.84	L.F.
CONSTRUCT 48-INCH RCP STORM DRAIN, D-LOAD PER PROFILE	1002	L.F.

APPROVED BY: [signature]
RIVERSIDE COUNTY, CALIF. FOR ROAD COMMISSIONER
DATE: 9/11/91

ENGINEER'S NOTE TO CONTRACTOR:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES, PIPES, AND/OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF THOSE TO BE USED OF ANY UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR DAMAGE TO MANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

CONTRACTOR SHALL NOTIFY THE COUNTY OR DISTRICT IN WRITING A MINIMUM OF TWO WEEKS BEFORE BEGINNING CONSTRUCTION, AND SHALL NOT BEGIN CONSTRUCTION BEFORE OBTAINING AUTHORIZATION TO PROCEED.

Sept 28, 1992

PLANS PREPARED UNDER THE SUPERVISION OF:
WILLDAN ASSOCIATES
290 S. ANAHEIM BLVD.
ANAHEIM, CALIF. 92805
(213) 924-1831 (714) 774-5740
REGISTRATION EXP. DATE 12-31-92
[signature] 8/28/92
R.C.E. 24707

BENCH MARK: M.L. 1-64
AT THE SOUTHWEST CORNER OF EL RIVENO ROAD AND HALL AVENUE 42.0 FEET SOUTH OF EL RIVENO ROAD 27.0 FEET WEST OF HALL AVENUE 3.0 FEET NORTH OF TELEPHONE POLE # 752594-H 1.0 FOOT EAST OF A MARKER POST, A BRASS DISC IN THE TOP OF A CONCRETE POST AND MARKED M.L. -64
ELEV. 946.887 DATE 5-71

REVISIONS:

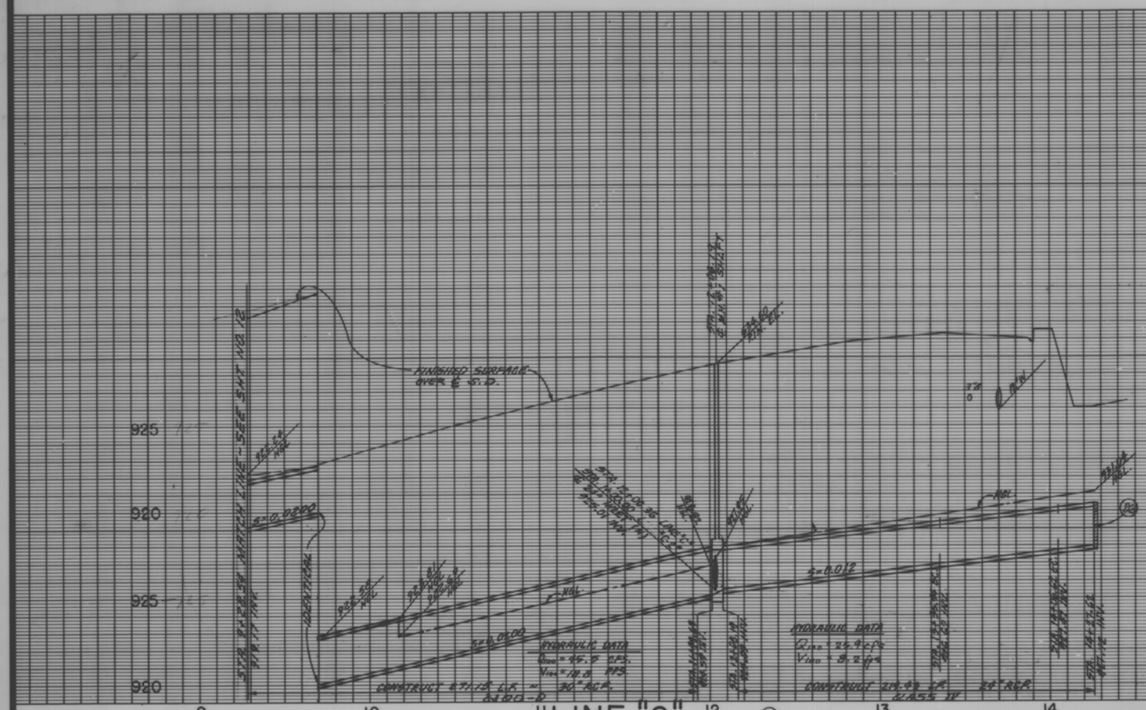
REF.	DESCRIPTION	APPR.	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] PLANNING DIRECTOR
DATE: 11/23/92
APPROVED BY: [signature] CHIEF ENGINEER
DATE: 2-1-92

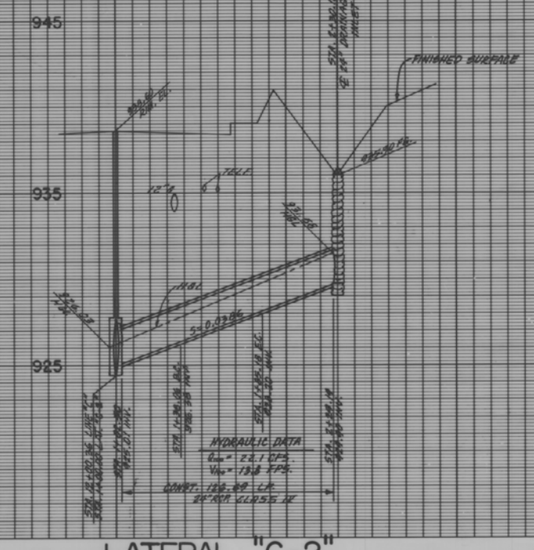
AGUA MANSA
BROWN AVENUE STORM DRAIN
WILSON STREET STORM DRAIN AND LATERALS
TITLE SHEET
P.M. 24088; P.M. 12104-(SAN BERNARDINO COUNTY)

PROJECT NO. 1-0-335
DRAWING NO. 1-514
SHEET NO. 1 OF 30

TITLE1-11-X-30ESS



"LINE "C"

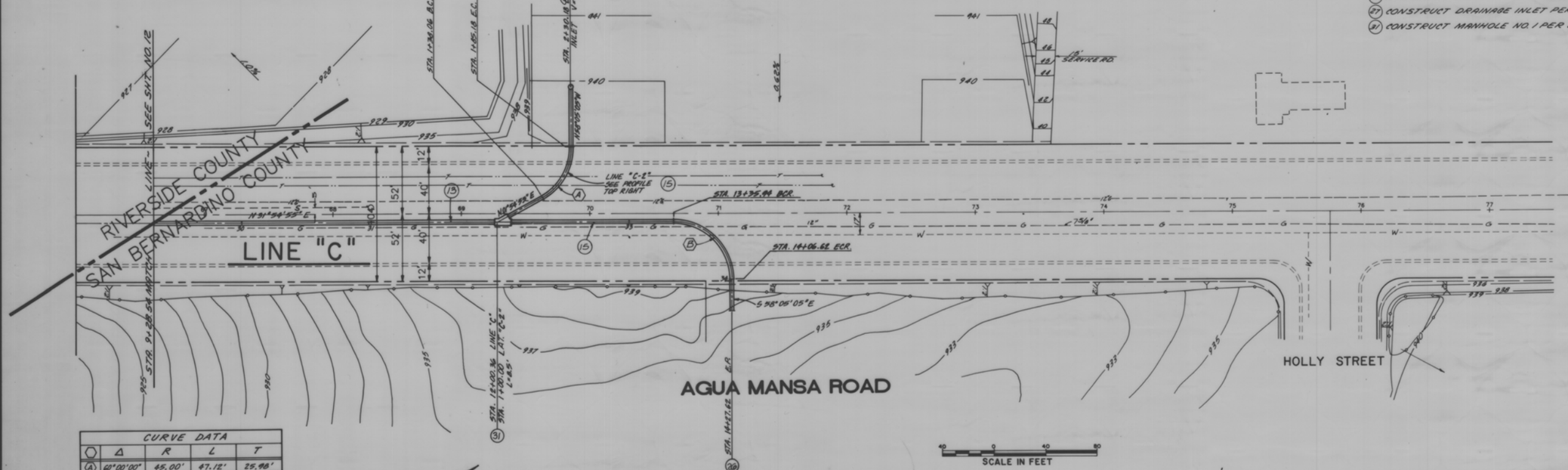


LATERAL "C-2"

PROFILE SCALES
VERT. 1" = 4'
HORIZ. 1" = 40'

CONSTRUCTION NOTES

(13) CONSTRUCT 30-INCH RCP STORM DRAIN, D-LOAD PER PROFILE
(15) CONSTRUCT 24-INCH RCP STORM DRAIN, D-LOAD PER PROFILE
(26) CONSTRUCT CONCRETE BULKHEAD PER RCFCD STD. DWG. NO. M-816
(27) CONSTRUCT DRAINAGE INLET PER DETAIL NO. 1 ON SHEET NO. 26
(31) CONSTRUCT MANHOLE NO. 1 PER LACFCD STD. DWG. NO. 2-0102



CURVE DATA				
	Δ	R	L	T
(A)	60°00'00"	45.00'	47.12'	25.98'
(B)	90°00'00"	45.00'	70.69'	45.00'

PLANS PREPARED UNDER THE SUPERVISION OF:
WILLDAN ASSOCIATES
290 S. ANAHEIM BLVD.
ANAHEIM, CALIF. 92805
(213) 924-1631 (714) 774-5740
REGISTRATION EXP. DATE 12-31-93

BENCH MARK: M.L. 1-84
AT THE SOUTHWEST CORNER OF EL RIVINO ROAD AND HALL AVENUE 40.0 FEET SOUTH OF EL RIVINO ROAD 27.0 FEET WEST OF HALL AVENUE 3.0 FEET NORTH OF TELEPHONE POLE / 262584-H 1.0 FOOT EAST OF A MARKER POST, A BRASS DISK IN THE TOP OF A CONCRETE POST AND MARKED M.L. 1-84. ELEV. 940.687 DATE 5-71

REVISIONS:

REV.	DESCRIPTION	APPR.	APPR.	DATE

COUNTY OF SAN BERNARDINO
LAND DEVELOPMENT
APPROVED BY:
DATE: 3-30-92

AGUA MANSA
AGUA MANSA ROAD
STORM DRAIN
LINE "C"
STA. 9+70.00 TO STA. 14+27.62

PROJECT NO.
DRAWING NO.
SHEET NO. 13 OF 30

MADISON\SD-MAN8

PROFILE

PROFILE SCALES
VERT. 1" = 4'
HORIZ. 1" = 40'

EXIST. GROUND OVER S.D.
FINISHED SURFACE OVER S.D.
HGL
S=0.006
S=0.0086
S=0.0026
HYDRAULIC DATA
Qmax = 156.0 CFS
Vmax = 10.3 FPS
HYDRAULIC DATA
Qmax = 137.2 CFS.
Vmax = 9.8 FPS.
HYDRAULIC DATA
Qmax = 132.2 CFS.
Vmax = 9.3 FPS.
HYD. DATA
Qmax = 102.6 CFS
Vmax = 10.5 FPS
HYD. DATA
Qmax = 12.5 CFS
Vmax = 7.5 FPS
HYDRAULIC DATA
Qmax = 135.3 CFS
Vmax = 11.0 FPS
CONST. 168.65 L.F. - 51" RCP 1000-D
CONSTRUCT 89.26 L.F. - 51" RCP 1000-D
CONSTRUCT 88.26 L.F. - 51" RCP 1000-D
CONSTRUCT 175.72 L.F. - 51" RCP 1000-D
CONST. 18.99 L.F. 42" RCP 1700-D
EXIST. 42" RCP
EXIST. 24" RCP
EXIST. 18" RCP
EXIST. 36" RCP
EXIST. 30" RCP
EXIST. 48" RCP
EXIST. 54" RCP
EXIST. 60" RCP
EXIST. 66" RCP
EXIST. 72" RCP
EXIST. 78" RCP
EXIST. 84" RCP
EXIST. 90" RCP
EXIST. 96" RCP
EXIST. 102" RCP
EXIST. 108" RCP
EXIST. 114" RCP
EXIST. 120" RCP
EXIST.

PROFILE

PROFILE SCALES
VERT. 1" = 4'
HORIZ. 1" = 40'

STA. 67 + 73.67
PLAN VIEW THIS SHEET

STA. 66 + 67.71
PLAN VIEW THIS SHEET

M.H. NO4 DETAIL

T.S. NO. 3 DETAIL

SECTION AT S.D STA. 1+90.00

PLAN

HALL AVENUE

SCALE IN FEET

CURVE DATA TABLE				
	Δ	R	L	T
(A)	17°03'59"	886.00'	263.91'	132.74'
(B)	14°00'20"	90.00'	22.00'	11.06'
(C)	42°04'00"	90.00'	33.10'	17.34'
(D)	9°19'14"	100.00'	16.27'	8.15'
(E)	12°24'06"	886.00'	191.77'	96.26'
(F)	20°21'10"	90.00'	31.97'	16.16'

STA. 66+67.71 E. INT.

EAST'LY CONN PIPE DATA				
A=30°	B=18"	C=7.8'	D=D=42"	EL "A"=924.81
				EL "B"=924.77

CONSTRUCTION NOTES

(10) CONSTRUCT 42-INCH RCP STORM DRAIN, D-LOAD PER PROFILE
(13) CONSTRUCT 30-INCH RCP STORM DRAIN, D-LOAD PER PROFILE
(16) CONSTRUCT 18-INCH RCP STORM DRAIN, CLASS III
(17) CONSTRUCT TS. NO. 3 PER RCFCD STD. DWG NO. TS 303.
(18) CONSTRUCT MANHOLE NO. 4 PER RCFCD STD. DWG NO MANHOLE 254
(22) CONSTRUCT C.B. NO. 1 PER RCFCD STD. DWG. NO. CB 100
(27) CONSTRUCT DRAINAGE INLET PER DETAIL 1 ON SHT. 27.

APPROVED BY: Kevin F. Blomquist
DATE: 9/11/91
RIVERSIDE COUNTY CHIEF FOR ROAD COMMISSIONER

PLANS PREPARED UNDER THE SUPERVISION OF
WILLDAN ASSOCIATES
290 S. ANAHEIM BLVD.
ANAHEIM, CALIF. 92805
(213) 924-1631 (714) 774-5740
REGISTRATION EXP. DATE 12-31-92
Anthony K. Hsu 8/8/90
R.C.E. 31787

REGISTERED PROFESSIONAL ENGINEER No. 31787 CIVIL STATE OF CALIFORNIA

BENCH MARK: M.L. 1-64
AT THE SOUTHWEST CORNER OF EL RIVINO ROAD AND HALL AVENUE 42.0 FEET SOUTH OF EL RIVINO ROAD 27.0 FEET WEST OF HALL AVENUE, 3.0 FEET NORTH OF TELEPHONE POLE # 752594-H 1.0 FOOT EAST OF A MARKER POST, A BRASS DISK IN THE TOP OF A CONCRETE POST AND MARKED ML 1-64
ELEV 946.687 DATE 5-71

REVISIONS:

REF.	DESCRIPTION	APPR.	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: Frank J. Kleine
PLANNING ENGINEER
DATE: 1/23/92

APPROVED BY: Kenneth R. Edwards
CHIEF ENGINEER
DATE: 2-1-92

AGUA MANSA BROWN AVE. STORM DRAIN

STA. 63+81.80 TO STA. 67+87.17
P.M. 24088

PROJECT NO. 1-0-335
DRAWING NO. 1-514
SHEET NO. 22 OF 30

MADISON (SO-HALL)

PROFILE

PROFILE SCALES
VERT. 1" = 4'
HORIZ. 1" = 40'

PLAN

SCALE IN FEET

CONSTRUCTION NOTES

(11) CONSTRUCT 39-INCH RCP STORM DRAIN, D-LOAD PER PROFILE
(15) CONSTRUCT 24-INCH RCP STORM DRAIN, D-LOAD PER PROFILE
(17) CONSTRUCT TS. NO.3 PER RCFCD STD. DWG. NO. TS-303
(18) CONSTRUCT MH NO. 4 PER RCFCD STD. DWG. NO MH 254
(20) CONSTRUCT M.H. NO. 2 PER RCFCD STD. DWG. NO. MH 252
(22) CONSTRUCT C.B. NO. 1 PER RCFCD STD. DWG NO. CB 100
(23) CONSTRUCT J.S. NO. 2 PER RCFCD STD. DWG NO. JS 227
(26) CONSTRUCT CONCRETE BULKHEAD PER RCFCD STD DWG NO M816
(27) CONSTRUCT DRAINAGE INLET PER DETAIL 1, SHEET NO. 27
(39) CONSTRUCT 33" RCP STORM DRAIN D-LOAD PER PROFILE.

STA. 9+95.79 ℄ INT.

CONN.	PIPE	DATA
A=30°	B=33°	C=8.88 EL"R"=976.90
D=33°	D=39°	EL"S"=976.86

J.S. NO. 2 DETAIL

SECTION AT S.D. STA. 5+00.00

STA. 1+46.92 ℄ INT.

CONN.	PIPE	DATA
A=30°	B=24°	C=7.9 EL"R"=972.56
D=39°	D=39°	EL"S"=972.93

M.H. NO. 4 DETAIL

T.S. NO. 3 DETAIL

STA. 1+46.44 ℄ INT.

CONN.	PIPE	DATA
A=65°	B=26	C=3.8 D=39 EL"R"=923.48
E=2.5	F=0.7	G=1.59 L=6.5 EL"S"=923.10

CURVE DATA

	Δ	R	L	T
(A)	121°56'43"	60.00'	127.7'	108.12'
(B)	90°00'00"	45.00	70.69	45'
(C)	137°1'51"	45.00	107.44'	5 85'
(D)	46°39'12"	45.00	36.64	19.40'

APPROVED BY:
RIVERSIDE COUNTY, CALIF.
FOR ROAD COMMISSIONER
DATE: 9/11/91

PLANS PREPARED UNDER THE SUPERVION OF:
WILLDAN ASSOCIATES
290 S. ANAHEIM BLVD.
ANAHEIM, CALIF. 92805
(213) 924 1631 (714) 774 5740
REGISTRATION EXP. DATE 12-31-92
R.C.E. 31727 8/8/90

BENCH MARK: M.L. 1-64
AT THE SOUTHWEST CORNER OF EL RIVENO ROAD AND HALL AVENUE 42.0 FEET SOUTH OF EL RIVENO ROAD 27.0 FEET WEST OF HALL AVENUE 3.0 FEET NORTH OF TELEPHONE POLE # 752594-H 1.0 FOOT EAST OF A MARKER POST, A BRASS DISC IN THE TOP OF A CONCRETE POST AND MARKED M.L. -64
ELEV. 946.687 DATE 5-71

REVISIONS:

REF.	DESCRIPTION	APPR.	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY PLANNING ENGINEER DATE: 11/23/92
APPROVED BY CHIEF ENGINEER DATE: 2-1-92

AGUA MANSA
HALL AVE. LATERAL
STA. 1 + 00.00 TO STA. 10 + 08.29
P.M. 24088

PROJECT NO. 1-0-335
DRAWING NO. 1-514
SHEET NO. 23 OF 30

STA. 9+74.93

PLAN VIEW SHT. NO. 21

STA. 19+29.54

PLAN VIEW SHT. NO. 16

STA. 19+60.73

PLAN VIEW SHT. 4

STA. 15+69.23

PLAN VIEW SEE SHT. NO. 14

STA. 15+29.60

PLAN VIEW SEE SHT. NO. 14

STA. 58+80.02

PLAN VIEW SEE SHT. NO. 14

STA. 61+75.09

PLAN VIEW SEE SHT. NO. 14

STA. 21+58.15

PLAN VIEW SHT. 5

STA. 31+85.48

PLAN VIEW SEE SHT. NO. 5

APPROVED BY:

DATE:

RIVERSIDE COUNTY, CALIF. FOR ROAD COMMISSIONER

PLANS PREPARED UNDER THE SUPERVISION OF:
WILLDAN ASSOCIATES
290 S. ANAHEIM BLVD.
ANAHEIM, CALIF. 92805
(213) 924-1831 (714) 774-5740
REGISTRATION EXP. DATE 12/31/99
Anthony K. Hom 6/7/99
R.C.E. 21778

BENCH MARK:

PROFILE SCALES:
HORIZ.: 1" = 4'
VERT.: 1" = 4'

DESIGNED BY: H.T.
CHECKED BY: A.K.H.

REVISIONS:

REF.	DESCRIPTION	APPR.	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER DATE:

APPROVED BY: CHIEF ENGINEER DATE:

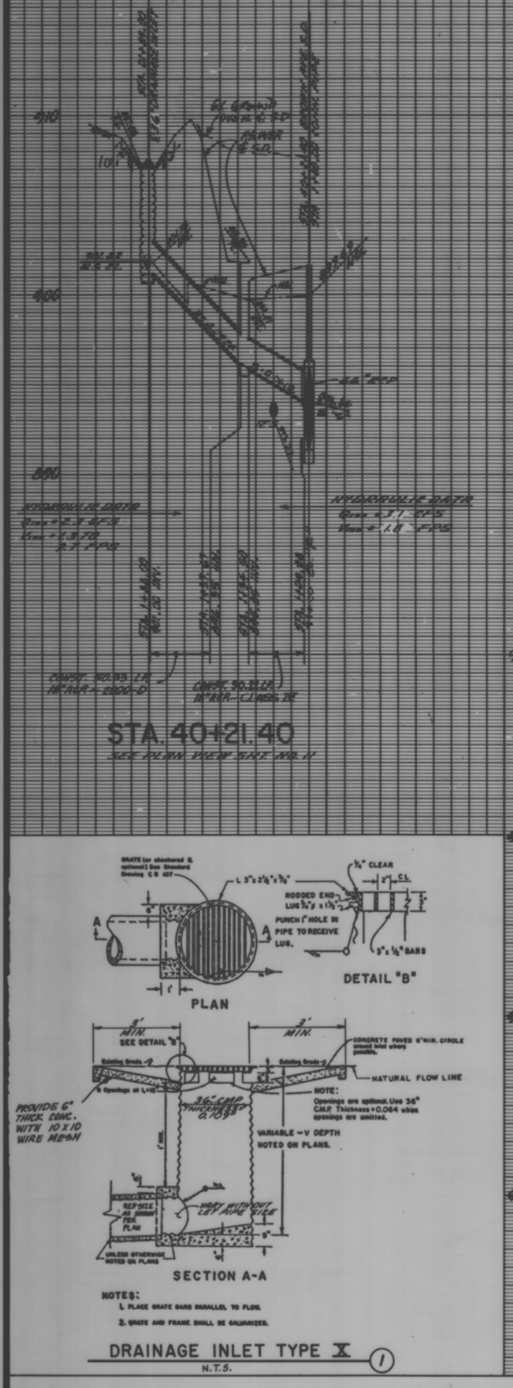
AGUA MANSA BROWN AVE. STORM DRAIN CONNECTOR PIPE PROFILES

PARCEL MAP 24088

PROJECT NO. 1-0-335

DRAWING NO. 1-514

SHEET NO. 24 A OF 30

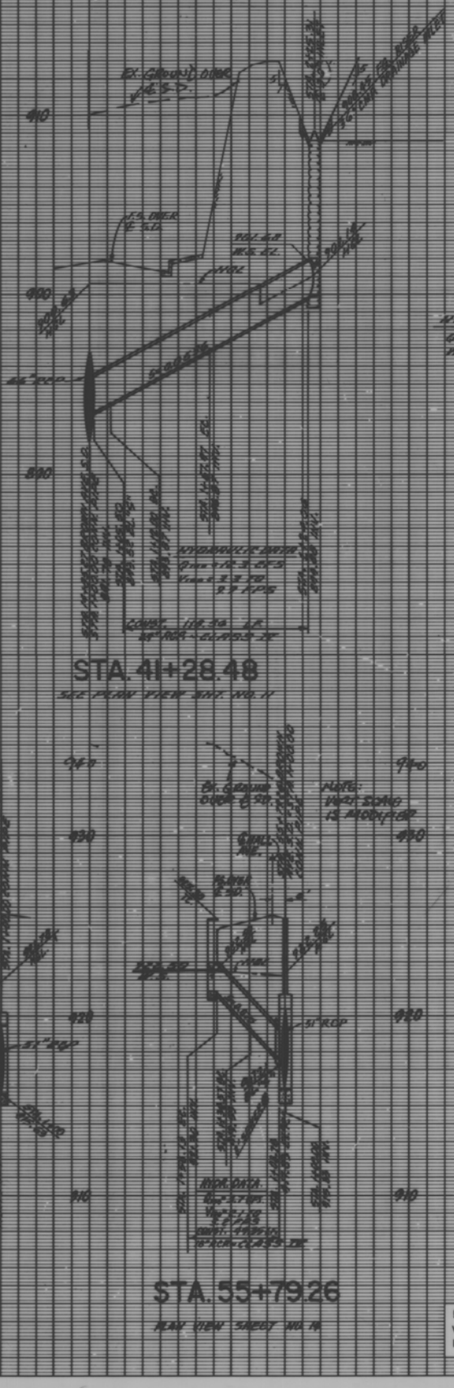


DRAINAGE INLET TYPE X (1)

N.T.S.

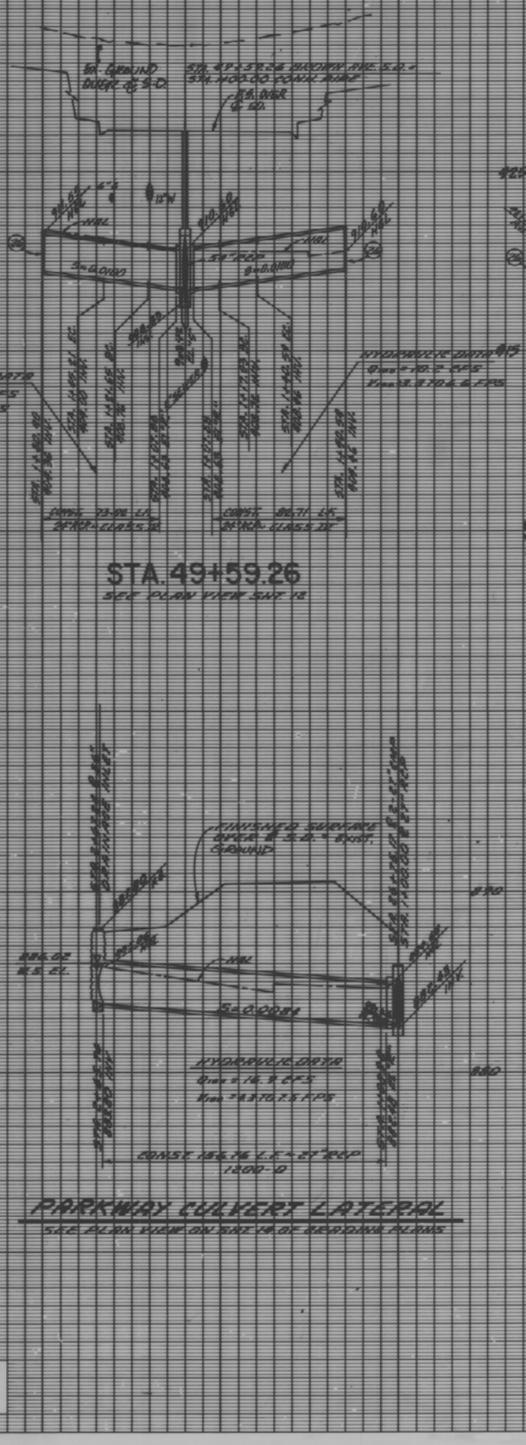
STA. 40+21.40

SEE PLAN VIEW SHT. NO. 11



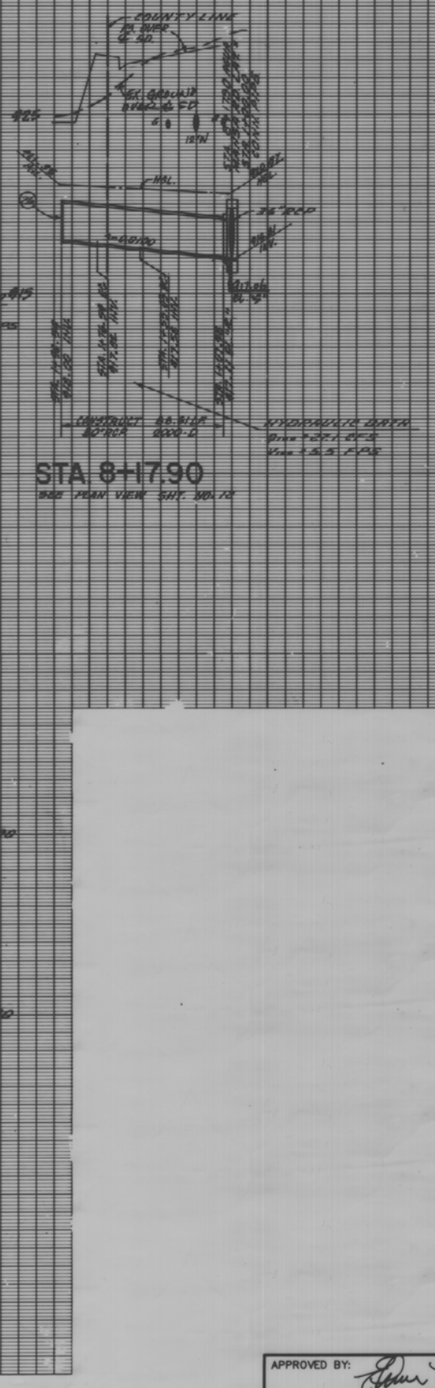
STA. 41+28.48

SEE PLAN VIEW SHT. NO. 11



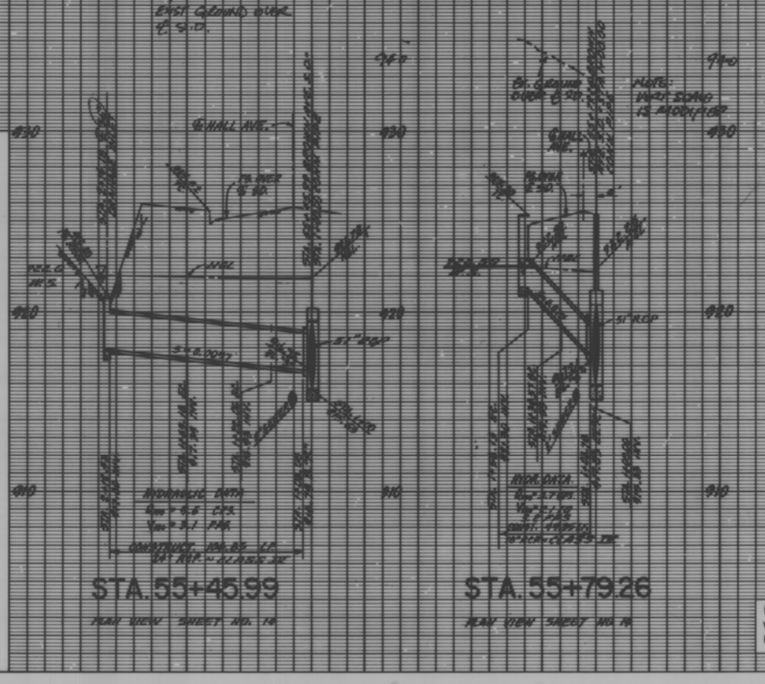
STA. 49+59.26

SEE PLAN VIEW SHT. 13



STA. 8+17.90

SEE PLAN VIEW SHT. NO. 13



STA. 55+45.99

PLAN VIEW SHEET NO. 16

STA. 55+79.26

PLAN VIEW SHEET NO. 16

PARKWAY CULVERT LATERAL

SEE PLAN VIEW ON SHT 16 OF GRADING PLANS

PROFILE SCALES
VERT. 1" = 4'
HORIZ. 1" = 40'

APPROVED BY: [signature]
DATE: 9/16/97
RIVERSIDE COUNTY, CALIF. FOR ROAD COMMISSIONER

PLANS PREPARED UNDER THE SUPERVISION OF:
WILLDAN ASSOCIATES
290 S. ANAHEIM BLVD.
ANAHEIM, CALIF. 92805
(213) 924-1831 (714) 774-5740
REGISTRATION EXP. DATE 12-31-97
[signature] 9/16/97
R.C.E. 34787

BENCH MARK: M.L. 1-64
AT THE SOUTHWEST CORNER OF EL RIVINO ROAD AND HALL AVENUE 42.0 FEET SOUTH OF EL RIVINO ROAD 27.0 FEET WEST OF HALL AVENUE 3.0 FEET NORTH OF TELEPHONE POLE # 7535944-H 1.0 FOOT EAST OF A MARKER POST, A BRASS DISK IN THE TOP OF A CONCRETE POST AND MARKED M.L. 1-64. ELEV. 946.687
DATE 5-71

REVISIONS:

REF.	DESCRIPTION	APPR.	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: PLANNING ENGINEER — DATE:
APPROVED BY: CHIEF ENGINEER — DATE:

AGUA MANSA
CONNECTOR PIPE PROFILES
PARCEL MAP 24088

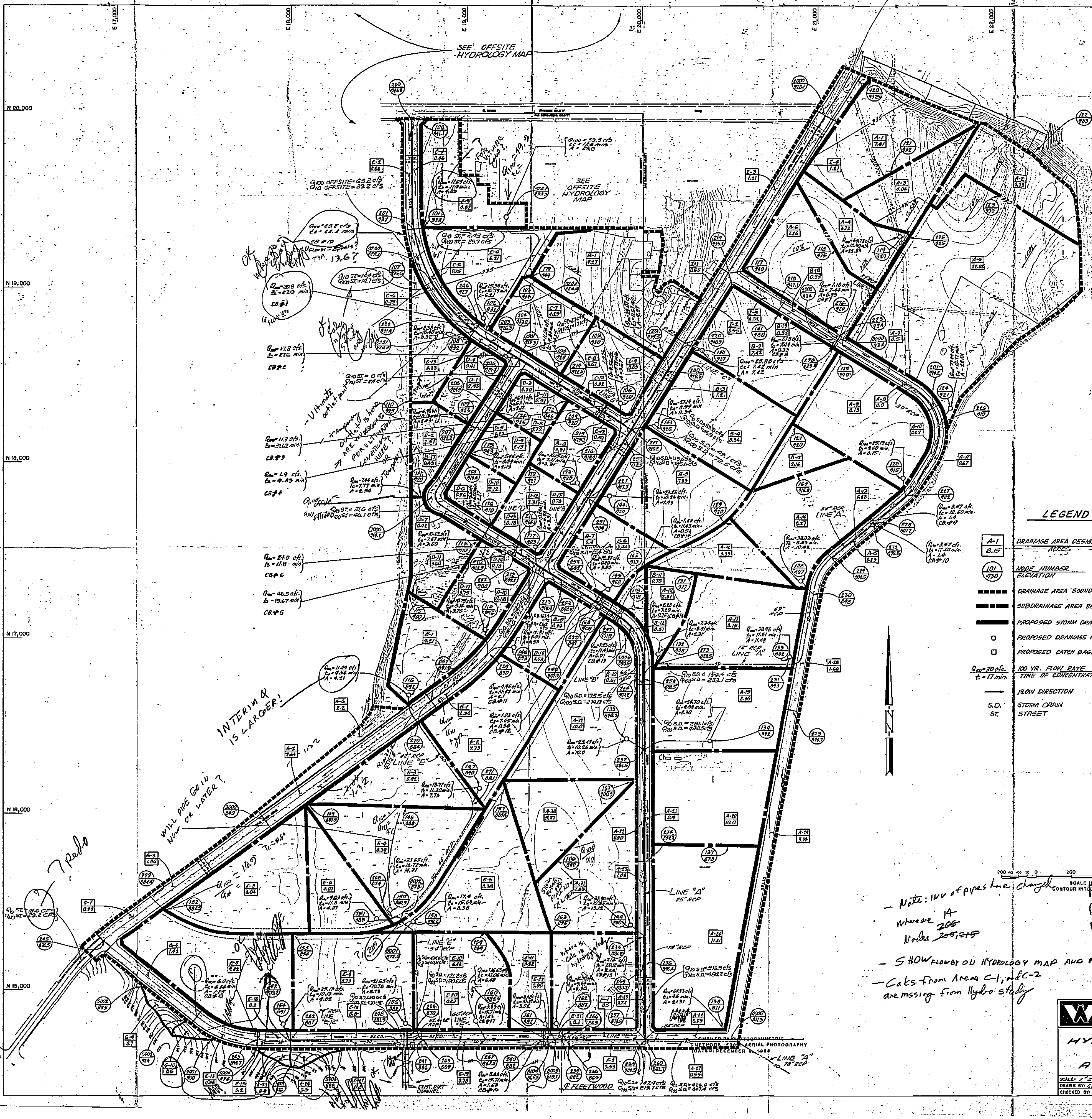
PROJECT NO. 1-0-335
DRAWING NO. 1-514
SHEET NO. 26 OF 30

BASE\HYD-RSDE

ATTACHMENT B

HYDROLOGY MAP FOR PM 24088 & PM 12104

18626 S. Wilmington Ave., Ste. 100 • Rancho Dominguez, CA 90220 • 310-605-6657 • 310-605-6658 Fax



LEGEND

A-1 / 8.15	DRAINAGE AREA DESIGNATION / ACRES
101 / 930	NODE NUMBER / ELEVATION
■■■■■	DRAINAGE AREA BOUNDARY
▬ ■ ▬	SUBDRAINAGE AREA BOUNDARY
▬▬▬	PROPOSED STORM DRAIN
○	PROPOSED DRAINAGE INLET
□	PROPOSED CATCH BASIN
Q_{100} = 30 cfs. / t = 17 min.	100 YR. FLOW RATE / TIME OF CONCENTRATION
→	FLOW DIRECTION
S.D.	STORM DRAIN
ST.	STREET

- Note: INV of pipes have changed where are 14 ~~206~~ Nodes ~~205, 215~~
- SHOW FLOWBY ON HYDROLOGY MAP AND PLANS
- Calcs from Areas C-1, and C-2 are missing from Hydro study

PLEASE RETURN
CHECK PRINTS TO RCFC
WITH NEXT SUBMITTAL
2nd ck SUB
1/31/90

RECEIVED
JAN 10 1990
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

WILLDAN ASSOCIATES
ENGINEERS • PLANNERS

HYDROLOGY PLAN FOR AGUA MANSA

SCALE: 1" = 200'	DATE:
DRAWN BY: L.R.	JOB NO.: 52909
CHECKED BY: R.K.H.	FIELD BK: