

DS #: 4462

APN: 139-29-301-003

PROJECT: LORENZI PARK RENOVATION - PHASE 2

SUBMITTAL: 2ND

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____





CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: March 31, 2011
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: Lorenzi Park Renovation – Phase 2		COPIES TO: G.C. Wallace Companies
Cross Streets:	SEC of Washington Blvd. & Twin Lakes Dr.	City of Las Vegas Architectural Serv.
File Number:	F:\Depot\DSMemos\DS4462B.doc	Bart Anderson, P.E., DevCo
Parcel Number:	139-29-301-003	CCRFCO
Zoning Action:	SDR-38236	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES NO X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1 st Submittal	9/21/2010	10/5/2010	Not Approved	\$400.00	153952: \$400
2 nd Submittal	3/22/2011	3/31/2011	See Comments Below	\$400.00	165057 & 165058: \$400
TOTAL FEES (LDDRS):				\$800.00	----

REMARKS:

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
X	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. This drainage study is acceptable in concept; however, City of Las Vegas will not formally accept the study until the Clark County Regional Flood Control District (CCRFCO) has issued a letter of concurrence. The Engineer should contact the CCRFCO to confirm that they have begun their review.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

END OF REMARKS
ays

T/R/S: T20S/R61E/29
AREA M-29

Reid: 3/22/11

DS4462

M-29

\$400.

**RESPONSE TO COMMENTS
ON THE
TECHNICAL DRAINAGE STUDY
FOR
LORENZI PARK RENOVATION
PHASE 2**

865-004

March 2010

Prepared For:

**J. W. Zunino & Associates
3191 S. Jones Blvd.
Las Vegas, NV 89146
Phone: (702) 253-9390
Fax: (702) 253-1016**



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Lorenzi Park Renovation Phase 2 Date: March 2011

Location of Development a) Descriptive (Cross Streets) North/South: Twin Lakes Drive
East/West: Washington Avenue

b) Section: 29 Township: 20S Range: 61E

c) APN: 139-29-301-003

Name of Owner: City of Las Vegas c/o JW Zunino & Associates

Telephone No.: (702) 253-9390 Fax No. (702) 253-1016 E-Mail Address: Not available

Address: 3191 S. Jones Blvd; Las Vegas, NV 89146

Contact Person-Name: Ryan R. Belsick, P.E. Telephone No.: (702) 804-2000

* E-Mail Address: RBelsick@gcwallace.com Fax No.: (702) 804-2299

Firm: G. C. WALLACE COMPANIES

Address: 1555 S. Rainbow Blvd; Las Vegas, NV 89146

Type of Land Development/Land Disturbance

<input type="checkbox"/> Rezoning	<input type="checkbox"/> Subdivision Map	<input type="checkbox"/> Clearing and Grading Only
<input type="checkbox"/> Parcel Map	<input type="checkbox"/> Planned Unit Development	<input checked="" type="checkbox"/> Other (Please specify below)
<input type="checkbox"/> Large Parcel Map	<input type="checkbox"/> Building Permit	<u>Park Renovation</u>

1. Total Owned Land Area: At Site: +/- 60 acres Being Developed/Disturbed: +/- 25 acres

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? Yes** No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? Yes** No

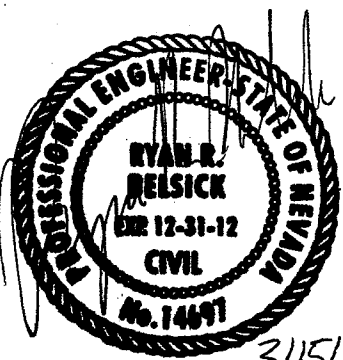
4. Proposed type of development (Residential, Commercial, Etc.): Community Park

5. Approximate upstream land area which drains to the subject site: 0 acres

6. Has the site drainage been evaluated in the past? Yes No If yes, please identify documentation: Technical Drainage Study for Lorenzi Park Renovation Phase 1, Lochsa, April 2007

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Twin Lakes Drive and Washington Avenue and through the park's existing Phase 1 to adjacent eastern parcel via block wall opening

8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

*New Required Field
**Review and concurrence of the Clark County Regional Flood Control District is required.

Local Entity File No.	Revision	Date

REFERENCE:

STANDARD FORM 1

**RESPONSE TO COMMENTS
ON THE
TECHNICAL DRAINAGE STUDY
FOR
LORENZI PARK RENOVATION
PHASE 2**

865-004

March 2010

Prepared For:

**J. W. Zunino & Associates
3191 S. Jones Blvd.
Las Vegas, NV 89146
Phone: (702) 253-9390
Fax: (702) 253-1016**

Prepared By:

**G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, NV 89146
Phone: (702) 804-2000
Fax: (702) 804-2299**



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

865-004

March 16, 2011

Writer's Contact Information:

804-2248

Mr. Albert Sung, PE
City of Las Vegas
Department of Public Works
731 South Fourth Street
Las Vegas, NV 89101

**Re: Technical Drainage Study for Lorenzi Park Renovation – Phase 2
DS 4462A**

Dear Mr. Sung:

The purpose of this letter is to address the comments from the City of Las Vegas dated October 5, 2010, regarding the above-referenced project. Your comments are individually addressed as follows:

Comment: "1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control (CCRFCD)* master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study."

Response: This study will be submitted to CCRFCD for their concurrence upon conditional approval by CLV.

Comment: "2. **Grading Plan (Sheet C4.01 to Sheet C4.03):** Label street grade elevations (TC) in *Washington Avenue* at regular intervals."

Response: Existing Top of Curb (TC) elevations have been labeled in *Washington Avenue*.

Comment: "3. The anticipated 100-year flow depth in *Washington Avenue* is about 1.2'. A proposed hump in the driveway off of a parking lot (Sheet C4.02) does not provide a freeboard of minimum six inches as required in the regional flood control guidelines. Review and revise accordingly."

Response: The subject location consists of proposed improvements to an existing driveway and existing parking lot. Due to existing grades, it would not be feasible to grade a 1.8-foot hump as would normally be required. Based on existing contours, the proposed hump height is approximately the same as in existing conditions, and therefore does not pose a negative impact over existing conditions.

Comment: "4. Address in the next addendum what measures have been provided along the back of sidewalk of *Washington Avenue* to flood protect the park."

Response: The north half of the park discharges to *Washington Avenue* in existing conditions. Because there is no storm drain in *Washington Avenue* and the park is bordered on

all sides by existing development, this drainage pattern of discharging into Washington Avenue by surface flow is perpetuated in the interim and ultimate conditions. Surface drainage to Washington Avenue prevents the use of a continuous floodwall/berm along Washington Avenue, as this would also block drainage from the park to Washington Avenue. Note that proposed flow rates in Washington Avenue are at or below existing condition flow rates; therefore, the high flow depths are an existing condition, onsite buildings adjacent to Washington Avenue are existing, and the proposed improvements do not pose a negative impact over existing conditions.

Comment: "5. Comments #2 and #4 apply to *Twin Lakes Drive* also. Review and address in the next addendum."

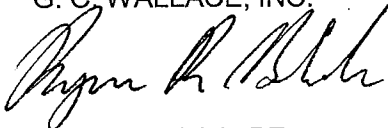
Response: Street grade elevations have been labeled in *Twin Lakes Drive*. Previous submittals have shown the entire flow from referenced Subbasins LC15 and WA11 discharging to *Twin Lakes Drive* at street Sections A-A to the south and B-B to the north, respectively. However, topography and street layouts show that only a minor portion of each basin is discharged to *Twin Lakes Drive* adjacent to the park. Figures 5R and 6R have been revised to show Prorated Subbasins LC15-A and WA11-A discharging to *Twin Lakes Drive*. Revised street section calculations for Sections A-A and B-B have been included in Appendix B and show that flows are contained below the top of curb. Therefore, no additional protection has been provided along the back of sidewalk of *Twin Lakes Drive*.

Additional comments:

Due to revisions to some landscape grading since the previous submittal, areas for Interim Conditions Subbasins ND1, IND4, IND6, and IND7 and Ultimate Conditions Subbasins ND1, UND4, UND6, and UND7 have changed. However, the overall flow patterns remain the same and the flow rates shown at Combination Points CMD1, CMD2, and CMD3 are at or below those shown in the previous submittal. Revised figures and HEC-1 Analyses are provided in the Appendix.

If you have any questions or require additional information, please contact our office at 804-2000.

Cordially,
G. C. WALLACE, INC.



Ryan R. Belsick, PE
Vice President
Flood Control Division

Enclosures

c: Calvin L. Black, GCW

**LORENZI PARK RENOVATION
(PHASE 2)
APPENDIX LAYOUT**

1. CLV Comment Letter
2. Figure 5R – Interim Conditions Drainage Map
3. Figure 6R – Ultimate Conditions Drainage Map
4. Interim Conditions HEC-1 Analysis
5. Ultimate Conditions HEC-1 Analysis

865-004

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		October 5, 2010
TO:		FROM:
Land Development Services Department of Public Works		Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for		COPIES TO:
Lorenzi Park Renovation – Phase 2		G.C. Wallace Companies
Cross Streets:	SEC of Washington Blvd. & Twin Lakes Dr.	City of Las Vegas Architectural Serv.
File Number:	F:\Depot\DS\Memos\DS4462A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	139-29-301-003	CCRFCD
Zoning Action:	SDR-38236	
FEMA Flood Zone:	YES NO X	
Proposed Storm Drain:	YES NO X	

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NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

END OF REMARKS
ays

T/R/S: T20S/R61E/29
AREA M-29

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1*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
* RUN DATE 14MAR11 TIME 13:51:09
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*****
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*****

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X X XXXXXXX XXXXX X
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X X X X X X
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1G, HEC1D8, AND HEC1KW.
 THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
 THE DEFINITION OF -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

*DIAGRAM

*** FREE ***

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1 ID *****
2 ID *
3 ID *
4 ID * LORENZI PARK RENOVATION
5 ID * UPDATE (PHASE 2) RTC
6 ID * INTERIM CONDITIONS
7 ID *
8 ID *
9 ID * RETURN PERIOD _ _ _ 100 & 10 -YEAR
10 ID * DISTRIBUTION _ _ _ 6-HOUR SDN3
11 ID * PROJECT NO _ _ _ 865-004
12 ID * FILENAME _ _ _ INT.H1
13 ID * DATE MODELED _ _ _ 11/24/2010
14 ID * MODELED BY _ _ _ REH
15 ID *
16 ID *
17 ID *****
18 ID
19 ID
20 IT 5 0 0 300
21 IO 5 0 0
22 IN 5 0 0
23 JR PREC 1 0.57
*
24 KK UND5
25 KM 0.92 ACRES
26 PB 2.77
27 BA 0.0014
28 PC 0.000 0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.130
29 PC 0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.181
30 PC 0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.249
31 PC 0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.409
32 PC 0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.856
33 PC 0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.976
34 PC 0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.998
35 PC 0.998 0.999 1.000
36 LS 0 98.0
37 UD .097
*
38 KK UND4
39 KM 5.62 ACRES
40 BA 0.0088
41 LS 0 93.5
42 UD .083
*

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

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43 KK ND1
44 KM 5.92 ACRES
45 BA 0.0093
46 LS 0 89.0
47 UD .122
*
48 KK CMD1
49 HC 2
*
50 KK ND2
51 KM 4.68 ACRES
52 BA 0.0073

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INT.OUT

53	LS	0	96.7							
54	UD	.121								
	*									
55	KK	CMD2								
56	HC	3								
	*									
57	KK	UND6								
58	KM	11.69	ACRES							
59	BA	0.0183								
60	LS	0	80.6							
61	UD	.135								
	*									
62	KK	RUND6								
63	KM	ROUTE	BASIN UND6 THROUGH ND3							
64	RK	450	0.030	0.030	0	TRAP	5	100		
65	RK	1950	0.004	0.013	0	TRAP	4	0		
	*									
66	KK	UND7								
67	KM	5.78	ACRES							
68	BA	0.0090								
69	LS	0	94.6							
70	UD	.099								
	*									
71	KK	RUND7								
72	KM	ROUTE	BASIN UND7 THROUGH ND3							
73	RK	1950	0.004	0.013	0	TRAP	4	0		
	*									
74	KK	ND3								
75	KM	25.30	ACRES							
76	BA	0.0395								
77	LS	0	84.5							
78	UD	.155								
	*									

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HEC-1 INPUT

PAGE 3

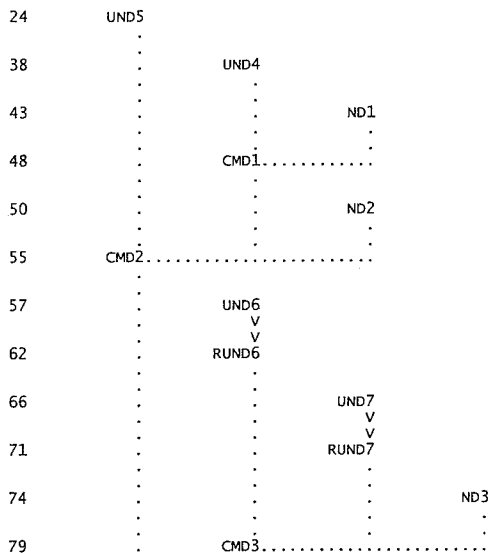
LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

79	KK	CMD3								
80	HC	3								
	*									
81	ZZ									

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
 NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 14MAR11 TIME 13:51:09
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*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****
  
```

INT.OUT

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*-----*
*          LORENZI PARK RENOVATION          *
*          UPDATE (PHASE 2) RTC             *
*          INTERIM CONDITIONS               *
*-----*
*          RETURN PERIOD_ 100 & 10 -YEAR   *
*          DISTRIBUTION_ 6-HOUR SDN3       *
*          PROJECT NO_ 865-004             *
*          FILENAME_ INT.H1                 *
*          DATE MODELED_ 11/24/2010        *
*          MODELED BY_ REH                  *
*-----*

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21 IO OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA
 NMIN 5 MINUTES IN COMPUTATION INTERVAL
 IDATE 1 0 STARTING DATE
 ITIME 0000 STARTING TIME
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 2 0 ENDING DATE
 NDTIME 0055 ENDING TIME
 ICENT 19 CENTURY MARK
 COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS
 DRAINAGE AREA SQUARE MILES
 PRECIPITATION DEPTH INCHES
 LENGTH, ELEVATION FEET
 FLOW CUBIC FEET PER SECOND
 STORAGE VOLUME ACRE-FEET
 SURFACE AREA ACRES
 TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 1.00 .57

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	RATIO 2
				1.00	.57
HYDROGRAPH AT	UND5	.00	1	3.50	2.350
+				3.50	3.50
HYDROGRAPH AT	UND4	.01	1	17.350	8.350
+				3.50	3.50
HYDROGRAPH AT	ND1	.01	1	14.358	6.358
+				3.58	3.58
2 COMBINED AT	CMD1	.02	1	30.350	13.350
+				3.50	3.50
HYDROGRAPH AT	ND2	.01	1	13.358	7.358
+				3.58	3.58
3 COMBINED AT	CMD2	.03	1	46.350	22.350
+				3.50	3.50
HYDROGRAPH AT	UND6	.02	1	18.358	5.358
+				3.58	3.58
ROUTED TO	RUND6	.02	1	17.358	5.367
+				3.58	3.67
HYDROGRAPH AT	UND7	.01	1	17.350	8.350
+				3.50	3.50
ROUTED TO	RUND7	.01	1	16.358	8.358
+				3.58	3.58
HYDROGRAPH AT	ND3	.04	1	46.358	16.358
+				3.58	3.58

3 COMBINED AT
 + CMD3 .07 1 FLOW 79. 29.
 TIME 3.58 3.58
 1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
 (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	DT (MIN)	INTERPOLATED TO COMPUTATION INTERVAL		VOLUME (IN)
							PEAK (CFS)	TIME TO PEAK (MIN)	
FOR PLAN = 1 RUND6	MANE	RATIO= 1.00 1.17	18.12	217.25	1.12	5.00	17.19	215.00	1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1089E+01 EXCESS= .0000E+00 OUTFLOW= .1092E+01 BASIN STORAGE= .1151E-04 PERCENT ERROR= -.3

FOR PLAN = 1 RUND6	MANE	RATIO= .57 1.82	5.36	218.11	.34	5.00	5.31	220.00	.34
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .3355E+00 EXCESS= .0000E+00 OUTFLOW= .3359E+00 BASIN STORAGE= .1128E-04 PERCENT ERROR= -.1

FOR PLAN = 1 RUND7	MANE	RATIO= 1.00 1.27	16.41	212.27	2.20	5.00	15.84	215.00	2.20
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .1049E+01 EXCESS= .0000E+00 OUTFLOW= .1054E+01 BASIN STORAGE= .1323E-04 PERCENT ERROR= -.5

FOR PLAN = 1 RUND7	MANE	RATIO= .57 1.58	8.24	214.29	1.06	5.00	8.16	215.00	1.06
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .5059E+00 EXCESS= .0000E+00 OUTFLOW= .5098E+00 BASIN STORAGE= .1373E-04 PERCENT ERROR= -.8

*** NORMAL END OF HEC-1 ***

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* VERSION 4.1
* RUN DATE 14MAR11 TIME 13:52:26
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*****
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
* *****

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XXXXXXXX XXXX X XXXXX X
X X X X X X
X X X X X X
X X XXXXXXX XXXXX XXX

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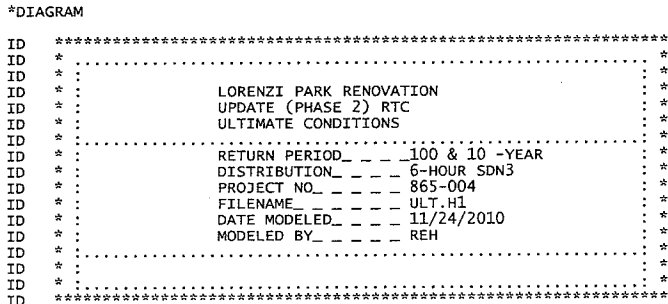
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 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

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*** FREE ***
1 ID *****
2 ID *
3 ID *
4 ID *
5 ID *
6 ID *
7 ID *
8 ID *
9 ID *
10 ID *
11 ID *
12 ID *
13 ID *
14 ID *
15 ID *
16 ID *
17 ID *
18 ID *
19 ID *
20 IT 5 0 0 300
21 IO 5 0 0
22 IN 5 0 0
23 JR PREC 1 0.57

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24 KK UND5
25 KM 0.92 ACRES
26 PB 2.77
27 BA 0.0014
28 PC 0.000 0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.130
29 PC 0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.181
30 PC 0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.249
31 PC 0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.409
32 PC 0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.856
33 PC 0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.976
34 PC 0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.998
35 PC 0.998 0.999 1.000
36 LS 0 98.0
37 UD .097
*
38 KK UND4
39 KM 5.62 ACRES
40 BA 0.0088
41 LS 0 93.5
42 UD .083
*

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

43 KK ND1
44 KM 5.92 ACRES
45 BA 0.0093
46 LS 0 89.0
47 UD .122
*
48 KK CMD1
49 HC 2
*
50 KK ND2
51 KM 4.68 ACRES
52 BA 0.0073

```

ULT.OUT

```

53      LS      0    96.7
54      UD      .121
      *
55      KK      CMD2
56      HC      3
      *
57      KK      UND6
58      KM      8.90 ACRES
59      BA      0.0139
60      LS      0    80.6
61      UD      .135
      *
62      KK      RUND6
63      KM      ROUTE BASIN UND6 THROUGH ND3
64      RK      450 0.030 0.030 0    TRAP    5    100
65      RK      1950 0.004 0.013 0    TRAP    4    0
      *
66      KK      UND7
67      KM      8.55 ACRES
68      BA      0.0134
69      LS      0    95.1
70      UD      .099
      *
71      KK      RUND7
72      KM      ROUTE BASIN UND7 THROUGH ND3
73      RK      1950 0.004 0.013 0    TRAP    4    0
      *
74      KK      ND3
75      KM      25.32 ACRES
76      BA      0.0396
77      LS      0    84.5
78      UD      .155
      *

```

1 HEC-1 INPUT PAGE 3

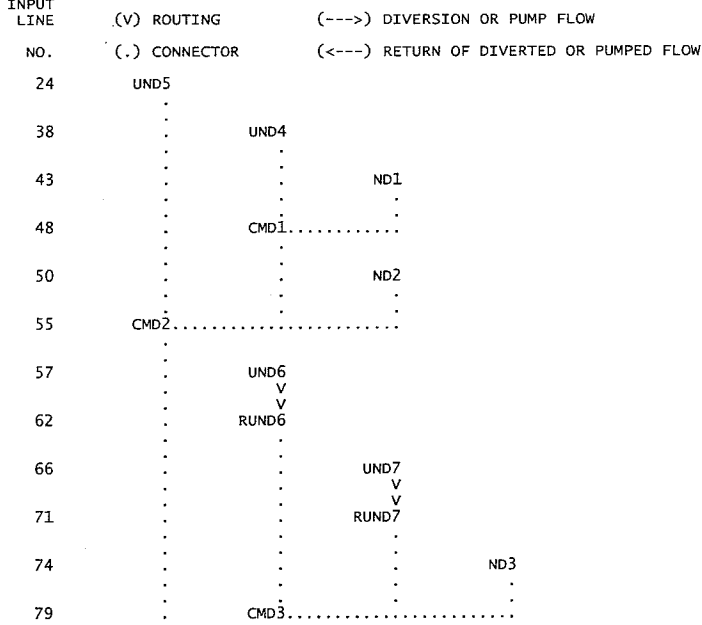
LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

```

79      KK      CMD3
80      HC      3
      *
81      ZZ

```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK



```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 14MAR11 TIME 13:52:26 *
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*****

```


ULT.OUT

+ 3 COMBINED AT
 CMD3 .07 1 FLOW 82. 32.
 TIME 3.58 3.58

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
 (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	DT (MIN)	INTERPOLATED TO		VOLUME (IN)
							COMPUTATION PEAK (CFS)	INTERVAL TIME TO PEAK (MIN)	
FOR PLAN = 1	RATIO= 1.00								
RUND6	MANE	1.25	13.78	217.60	1.12	5.00	12.97	215.00	1.12

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8269E+00 EXCESS= .0000E+00 OUTFLOW= .8300E+00 BASIN STORAGE= .1152E-04 PERCENT ERROR= -.4

FOR PLAN = 1	RATIO= .57								
RUND6	MANE	1.95	4.06	218.36	.35	5.00	4.04	220.00	.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2548E+00 EXCESS= .0000E+00 OUTFLOW= .2558E+00 BASIN STORAGE= .1349E-04 PERCENT ERROR= -.4

FOR PLAN = 1	RATIO= 1.00								
RUND7	MANE	1.08	24.89	212.04	2.24	5.00	23.73	215.00	2.24

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1597E+01 EXCESS= .0000E+00 OUTFLOW= .1604E+01 BASIN STORAGE= .1082E-04 PERCENT ERROR= -.4

FOR PLAN = 1	RATIO= .57								
RUND7	MANE	1.36	12.68	213.51	1.10	5.00	12.40	215.00	1.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7818E+00 EXCESS= .0000E+00 OUTFLOW= .7857E+00 BASIN STORAGE= .1271E-04 PERCENT ERROR= -.5

*** NORMAL END OF HEC-1 ***

LETTER OF TRANSMITTAL



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

Project No.: 865-004
Date: March 17, 2011

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

To: **City of Las Vegas**
City of Las Vegas - Flood Control Section
Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Writer's Contact Information:

702.804.2000

Attention: Albert Sung, PE

Subject: **Technical Drainage Study for Lorenzi Park Renovation Phase 2**

Sent Via: Hand Delivery

Items being sent:

One (1) Copy – Response to Comments for Subject Study
One (1) Copy – Revised Improvement Plans (bound)
One (1) Copy – Stamped and Signed Standard Form 1 (bound)
Check (#13180) for \$100

These items are submitted:

- | | |
|--|--|
| <input type="checkbox"/> At your request | <input type="checkbox"/> For your action |
| <input type="checkbox"/> For your approval | <input checked="" type="checkbox"/> For your files |
| <input checked="" type="checkbox"/> For your review and comments | <input type="checkbox"/> For your information |

Acknowledgment of receipt:

Required

Received by: _____

Date: _____

Time: _____

Remarks:

Cordially,

Copies to: Jerry Pruitt, GCW
Ryan Belsick, GCW
Johnnie Pate, GCW
Jay Guzman, GCW

G. C. WALLACE COMPANIES

Rachael R. Dennis, PE
Project Engineer
Flood Control Division

rrd

LETTER OF TRANSMITTAL



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

Project No.: 865-004
Date: March 22, 2011

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

To: **City of Las Vegas**
City of Las Vegas - Flood Control Section
Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Writer's Contact Information:

702.804.2000

Attention: Albert Sung, PE

Subject: **Technical Drainage Study for Lorenzi Park Renovation Phase 2**

Sent Via: Hand Delivery

Items being sent:

Check (#13180) for \$100
Check (#13181) for \$300

These items are submitted:

- | | |
|--|--|
| <input type="checkbox"/> At your request | <input type="checkbox"/> For your action |
| <input type="checkbox"/> For your approval | <input checked="" type="checkbox"/> For your files |
| <input checked="" type="checkbox"/> For your review and comments | <input type="checkbox"/> For your information |

Acknowledgment of receipt:

Required

Received by: _____

Date: _____

Time: _____

Remarks:

Cordially,

Copies to: Jerry Pruitt, GCW
Ryan Belsick, GCW
Johnnie Pate, GCW
Jay Guzman, GCW

G. C. WALLACE COMPANIES

Rachael R. Dennis, PE
Project Engineer
Flood Control Division

rrd

**** Duplicate Receipt ****

City of Las Vegas
Development Services Center
731 South Fourth Street
Las Vegas, NV 89101

03/22/2011 15:52 Trn 165058
Cashier 970040

PRJ Permit # DS4462 \$100.00

Subtotal \$100.00

Tax \$0.00

Total \$100.00

Received CHECK \$100.00

Check # 13180

Change \$0.00

For questions related to this receipt call
702-229-6251

**** Duplicate Receipt ****

City of Las Vegas
Development Services Center
731 South Fourth Street
Las Vegas, NV 89101

03/22/2011 15:52 Trn 165057
Cashier 970040

PRJ Permit # DS4462 \$300.00

Subtotal \$300.00

Tax \$0.00

Total \$300.00

Received CHECK \$300.00

Check # 13181

Change \$0.00

For questions related to this receipt call
702-229-6251