

VJW Storage, Inc.

Drainage Analysis

Prepared by

WILSON
& COMPANY
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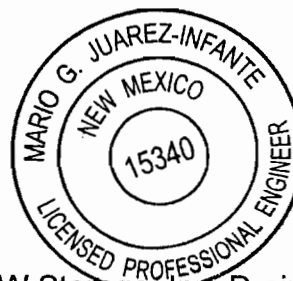
FINAL SUBMITTAL VERSION

December 5, 2007

I, Mario G. Juarez-Infante, P.E., do hereby certify that this document was prepared by me or under my direction, and is true and correct to the best of my knowledge and belief and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Mario G. Juarez-Infante, PE, CFM
NMPE No. 15340

Date



VJW Storage, Inc. Drainage Analysis

RIP RAP CHANNEL

Rip Rap Channel-13.5'

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.078	
Channel Slope	0.03080	ft/ft
Normal Depth	2.25	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)

Results

Discharge	53.03	ft ³ /s
Flow Area	15.19	ft ²
Wetted Perimeter	14.23	ft
Top Width	13.50	ft
Critical Depth	1.81	ft
Critical Slope	0.09833	ft/ft
Velocity	3.49	ft/s
Velocity Head	0.19	ft
Specific Energy	2.44	ft
Froude Number	0.58	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.25	ft
Critical Depth	1.81	ft
Channel Slope	0.03080	ft/ft
Critical Slope	0.09833	ft/ft

CONCRETE CHANNEL

Concrete Channel 12'

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012	
Channel Slope	0.03080	ft/ft
Normal Depth	2.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)

Results

Discharge	251.78	ft³/s
Flow Area	12.00	ft²
Wetted Perimeter	12.65	ft
Top Width	12.00	ft
Critical Depth	3.37	ft
Critical Slope	0.00189	ft/ft
Velocity	20.98	ft/s
Velocity Head	6.84	ft
Specific Energy	8.84	ft
Froude Number	3.70	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.00	ft
Critical Depth	3.37	ft
Channel Slope	0.03080	ft/ft
Critical Slope	0.00189	ft/ft

Worksheet for SE Tract C-1-A

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012	
Channel Slope	0.01000	ft/ft
Normal Depth	1.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)

Results

Discharge	22.59	ft ³ /s
Flow Area	3.00	ft ²
Wetted Perimeter	6.32	ft
Top Width	6.00	ft
Critical Depth	1.29	ft
Critical Slope	0.00261	ft/ft
Velocity	7.53	ft/s
Velocity Head	0.88	ft
Specific Energy	1.88	ft
Froude Number	1.88	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

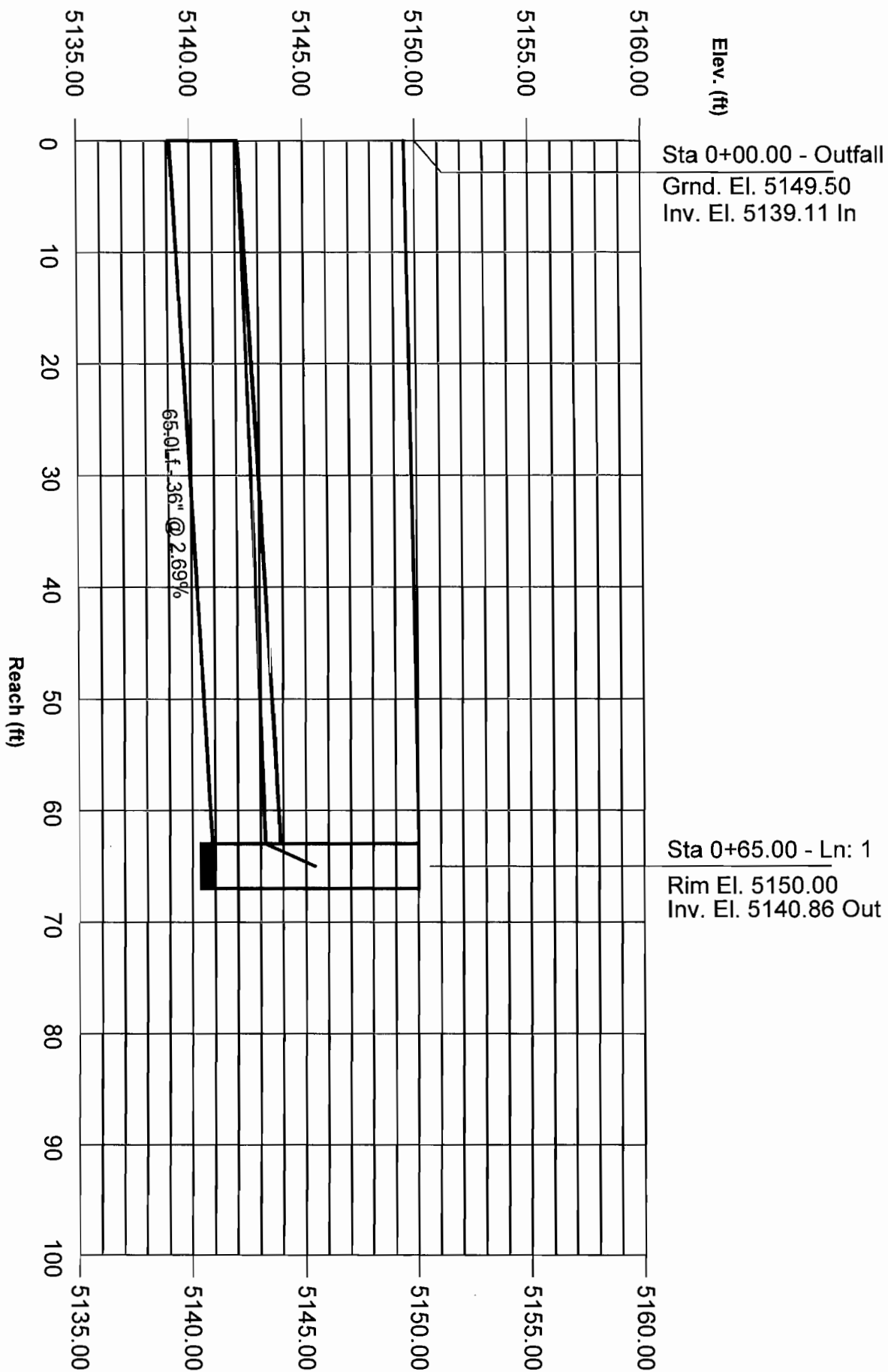
GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.00	ft
Critical Depth	1.29	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00261	ft/ft

STORM SEWER ANALYSIS

Storm Sewer Profile

Proj. file: New.stm



Hydraflow Plan View



Project File: New.stm

No. Lines: 1

12-05-2007

Storm Sewer Tabulation

Station	Len	Drng Area		Rnoff coeff	Area x C		T c		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID	
		To Line	(ft)		Incr	Total	(ac)	(ac)					(C)	Incr	Total	Inlet (min)	Syst (min)	Size (in)	Slope (%)	Up (ft)		Dn (ft)
1	End	65.0	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	54.00	109.4	8.38	36	2.69	5140.86	5139.11	5143.20	5142.11	5150.00	5149.50	
Project File: New.stm																						
Number of lines: 1															Run Date: 12-05-2007							
NOTES: Intensity = 76.31 / (Inlet time + 13.00) ^ 0.88; Return period = 2 Yrs.																						

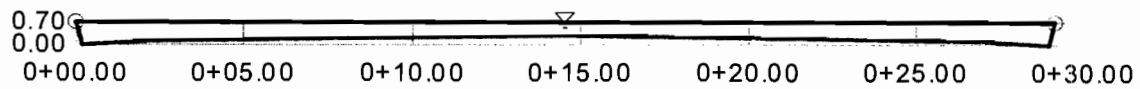
STREET CAPACITY

Cross Section

Cross Section for Irregular Channel

Project Description	
Worksheet	Street Flow
Flow Element	Irregular Ch
Method	Manning's F
Solve For	Discharge

Section Data	
Mannings Coeff	0.013
Slope	0.020000 ft/ft
Water Surface Elevation	0.67 ft
Elevation Range 0 to 0.67	
Discharge	137.01 cfs



V:1
H:1
NTS

SUMMARY

Summary of Analysis

Channel Type	Discharge Required	Discharge provided	Conclusion
Rip Rap Channel 13.5'	51.4 cfs	53.03 cfs	O.K
Concrete Channel 12'	51.4 cfs	251.78 cfs	O.K
Concrete Channel 6' SE Tract C-1-A	8 cfs	22.59 cfs	O.K