THIS PROJECT WAS WITHDRAWN PER KRISTEN ASHBECK – THE SCAN WILL NOT BE COMPLETED FOR THIS FILE BECAUSE THE PRELIMINARY WAS APPROVED IN SUBSEQUENT PROJECT FILE #1994-135

Table of Contents

File 1994-0087A Name: Micaela's Village - 2694 Unaweep Avenue-Preliminary Plan/Rezone

Present	Scanned	
		A few items are denoted with an asterisk (*), which means they are to be scanned for permanent record on the ISYS retrieval system. In some instances, items are found on the list but are not present in the scanned electronic development file because they are already scanned elsewhere on the system. These scanned documents are denoted with (**) and will be found on the ISYS query system in their designated categories. Documents specific to certain files, not found in the standard checklist materials, are listed at the bottom of the page. Remaining items, (not selected for scanning), will be listed and marked present. This index can serve as a quick guide for the contents of each file.
X	X	**Table of Contents**
		***Review Sheet Summary**
		***Application form**
		Review Sheets
		Receipts for fees paid for anything
		***Submittal checklist**
		***General project report**
		Reduced copy of final plans or drawings
		Reduction of assessor's map.
		Evidence of title, deeds, easements
		***Mailing list to adjacent property owners**
		Public notice cards
		Record of certified mail
		Legal description
		Appraisal of raw land
		Reduction of any maps – final copy
X	X	***Final reports for drainage and soils (geotechnical reports)**
		Other bound or non-bound reports
		Traffic studies
		***Review Comments**
		***Petitioner's response to comments**
		***Staff Reports**
		***Planning Commission staff report and exhibits**
		***City Council staff report and exhibits**
		***Summary sheet of final conditions**

DOCUMENT DESCRIPTION:

		Correspondence			Preliminary Plan and Preliminary Drainage Plan
		Drainage Reports			Fence Pictures
		Geo-technical Reports			
		E-mails			
		Preliminary Plan			
		Subcontractor's List			
		Soils Density Report – 12/8/95			
		Sidewalk Tests			
		Water and Sewer Acceptance Conditions			
		Sewer Line "A" Plan and Profile			
		Utility Composite Plan			

DEVELOPMENT APPLICATION

Community Development Department
250 North 5th Street Grand Junction, CO 81501
(303) 244-1430

Receipt _____
Date 2 March 1995
Rec'd By _____

File No. _____

We, the undersigned, being the owners of property situated in Mesa County, State of Colorado, as described herein do hereby petition this:

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
[X] Subdivision Plat/Plan	[ ] Minor [X] Major [ ] Resub	8.24 ac	Unaweep & 27 Road	PR 4.1 (PR 47-90)	Residential
[X] Rezone				From: PR4.1 To: PR4.7	
[X] Planned Development	[ ] ODP [ ] Prelim [X] Final				
[ ] Conditional Use					
[ ] Zone of Annex					
[ ] Text Amendment					
[ ] Special Use					
[ ] Vacation					[ ] Right-of-Way [ ] Easement

[ ] PROPERTY OWNER [ ] DEVELOPER [ ] REPRESENTATIVE

MARY LOU KENNEDY	← CIMARRON PROPERTIES	DAN BROWN
Name	Name	Name
2146½ B HWY 6+50	←	1018 COLO. AVE.
Address	Address	Address
GRAND JCT. CO. 81505	←	GR-JCT. CO.
City/State/Zip	City/State/Zip	City/State/Zip
303 245-6693	←	303 241-2370
Business Phone No.	Business Phone No.	Business Phone No.

NOTE: Legal property owner is owner of record on date of submittal.

We hereby acknowledge that we have familiarized ourselves with the rules and regulations with respect to the preparation of this submittal, that the foregoing information is true and complete to the best of our knowledge, and that we assume the responsibility to monitor the status of the applicat and the review comments. We recognize that we or our representative(s) must be present at all hearings. In the event that the petitioner is represented, the item will be dropped from the agenda, and an additional fee charged to cover rescheduling expenses before it can again be plac on the agenda.

David K. Brown — 3/2/95
Signature of Person Completing Application — Date

Mary Lou Kennedy — 3/2/95

Attach Additional Sheets if Necessary

DEVELOPMENT APPLICATION

Community Development Department
250 North 5th Street Grand Junction, CO 81501
(303) 244-1430

Receipt _____
Date _____
Rec'd By _____

File No. _____

We, the undersigned, being the owners of property situated in Mesa County, State of Colorado, as described herein do hereby petition this:

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
[X] Subdivision Plat/Plan	[ ] Minor [X] Major [ ] Resub				
[ ] Rezone				From: To:	
[X] Planned Development	[ ] ODP [X] Prelim [ ] Final	9 Acres	2694 Unaweep	PR-4.7-90	Single family Residential
[ ] Conditional Use					
[ ] Zone of Annex					
[ ] Text Amendment					
[ ] Special Use					
[ ] Vacation					[ ] Right-of-Way [ ] Easement

[X] PROPERTY OWNER [X] DEVELOPER [X] REPRESENTATIVE

Name	Name	Name
JOE LLOYD RODRIGUEZ		
Address	Address	Address
653 WINTER GREEN		
City/State/Zip	City/State/Zip	City/State/Zip
GRAND JUNCTION, COLORADO 81501		
Business Phone No.	Business Phone No.	Business Phone No.
434-8911		

NOTE: Legal property owner is owner of record on date of submittal.

We hereby acknowledge that we have familiarized ourselves with the rules and regulations with respect to the preparation of this submittal, that the foregoing information is true and complete to the best of our knowledge, and that we assume the responsibility to monitor the status of the application and the review comments. We recognize that we or our representative(s) must be present at all hearings. In the event that the petitioner is not represented, the item will be dropped from the agenda, and an additional fee charged to cover rescheduling expenses before it can again be placed on the agenda.

X Joe Lloyd Rodriguez — 4-28-94

Signature of Person Completing Application — Date

X

Signature of Property Owner(s) - Attach Additional Sheets if Necessary

DEVELOPMENT APPLICATION

Community Development Department
250 North 5th Street Grand Junction, CO 81501
(303) 244-1430

Receipt _____
Date _____
Rec'd By _____

File No. _____

We, the undersigned, being the owners of property situated in Mesa County, State of Colorado, as described herein do hereby petition this:

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
[X] Subdivision Plat/Plan	[ ] Minor [X] Major [ ] Resub				
[X] Rezone				From: To:	
[X] Planned Development	[ ] ODP [ ] Prelim [X] Final	8.24 ACRES			
[ ] Conditional Use					
[ ] Zone of Annex					
[ ] Text Amendment					
[ ] Special Use					
[ ] Vacation					[ ] Right-of-Way [ ] Easement

[X] PROPERTY OWNER [X] DEVELOPER [X] REPRESENTATIVE

JOE LLOYD RODRIGUEZ		
Name	Name	Name
653 WINTERGREEN		
Address	Address	Address
GRAND JUNCTION, CO 81501		
City/State/Zip	City/State/Zip	City/State/Zip
434-8911		
Business Phone No.	Business Phone No.	Business Phone No.

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Signature of Person Completing Application — Date 11/29/94

Joe Lloyd Rodriguez

Signature of Property Owner(s) - Attach Additional Sheets if Necessary

GENERAL PROJECT REPORT. McClea's Subdivision

My proposal is to build ~~forty~~ thirty-five new homes and delete existing mobile homes. These homes will be built to all U.B.C. , Mesa County and city codes. Each home will be ranging from 1100 to 1300 square feet with all custom options, wood siding,brick in front and interiors done to perfection. The address where these homes and new subdivision will be located is 2694 Unaweep Grand Junction , Colorado.

The area impacted by this project will be the area off of Unaweep running from Roubideau St. east to 27 Road. this is an excellent area for planned residential or RSF- 8. There is allot of parking area due to good planning and the excellent street access off of Unaweep and any other accesses the City of Grand Junction requires. This project will add beautification to the existing neighborhood and delete the eye sore of weeds and mobile homes presently there. The area is surrounded by similar homes in size most built in the late 1970's . There are plenty of schools from Columbus Elementary 2660 Unaweep to Orchard Mesa Junior High School 2736 Unaweep. Plenty of shopping with City Market less than one mile away. Several of the local individuals are familiar with my project and in complete approval of my project.

The project will have City water and Sewer services.Public Service Company of Colorado will install Electricity and Gas services. U.S. West communications will install the telephone services.Each of the homes will have private landscaping with strict convenes to be completed by owners. They will be maintained in order to establish A beautiful asset. to the neighborhood and the City of Grand Junction.

My proposal will not only beautify the neighborhood, but also increase the value of the area itself as well as the surrounding area.

Yours Truly,
LLOYD RODRIQUEZ

#87 94

Original
Do NOT Remove
From Office

GENERAL PROJECT REPORT

MICAELA'S VILLAGE

GRAND JUNCTION, COLORADO

DECEMBER 1994

MARY LOU KENNEDY: OWNER

A: PROJECT DESCRIPTION

1. LOCATION:

MICAELA'S VILLAGE IS LOCATED ADJACENT TO AND NORTH OF UNAWEEP AVE (C. ROAD) AND 175 WEST OF 27 ROAD ON ORCHARD MESA IN GRAND JUNCTION. THE PROPERTY IS LOCATED IN PART OF THE SOUTHEAST 1/4 OF SECTION 23, TOWNSHIP 1 NORTH, RANGE 1 WEST OF THE UTE MERIDIAN.

2. ACREAGE:

MICAELA'S VILLAGE CONSISTS OF 8.23 ACRES.

3. PROPOSED USE:

THE PROPOSAL CALLS FOR THE PHASED DEVELOPMENT OF 38 LOTS ON 8.24 ACRES. THE RESULTING DENSITY WILL BE 4.6 UNITS PER ACRE.

B. PUBLIC BENEFIT:

THIS SUBDIVISION WILL MEET THE NEED FOR AFFORDABLE HOUSING IN THE GRAND JUNCTION AREA. ATTRACTIVE HOUSES ON GOOD STREETS WITH GOOD SIDEWALKS WILL ENHANCE THE AREA AND REMOVE A LONG STANDING WEED-PATCH. ALSO THE COMPLETING OF THE PROJECT WILL RESULT IN THE REMOVAL OF NON-CONFORMING TRAILER HOUSES EXISTING ON THE EAST SIDE OF THE PROPERTY.

C. PROJECT COMPLIANCE, COMPATIBILITY, AND IMPACT

1. A 4.1 ZONING HAS BEEN PREVIOUSLY APPROVED BY THE CITY. THIS DENSITY WAS ERRONEOUSLY CALCULATED USING ALL OF THE RIGHT-OF=WAY OF UNAWEEP AVENUE. A PLAN WAS APPROVED CALLING FOR 37 LOTS. EVEN THOUGH THE NUMBER OF LOTS WILL ONLY BE ONE MORE, THE REQUEST FOR THE 4.6 UNITS PER ACRE ZONING IS WILL SET THE NUMBERS STRAIGHT. ADDITIONALLY 10 FEET OF RIGHT-OF-WAY WILL BE DEEDED TO THE CITY FOR THE WIDENING OF UNAWEEP AVENUE.

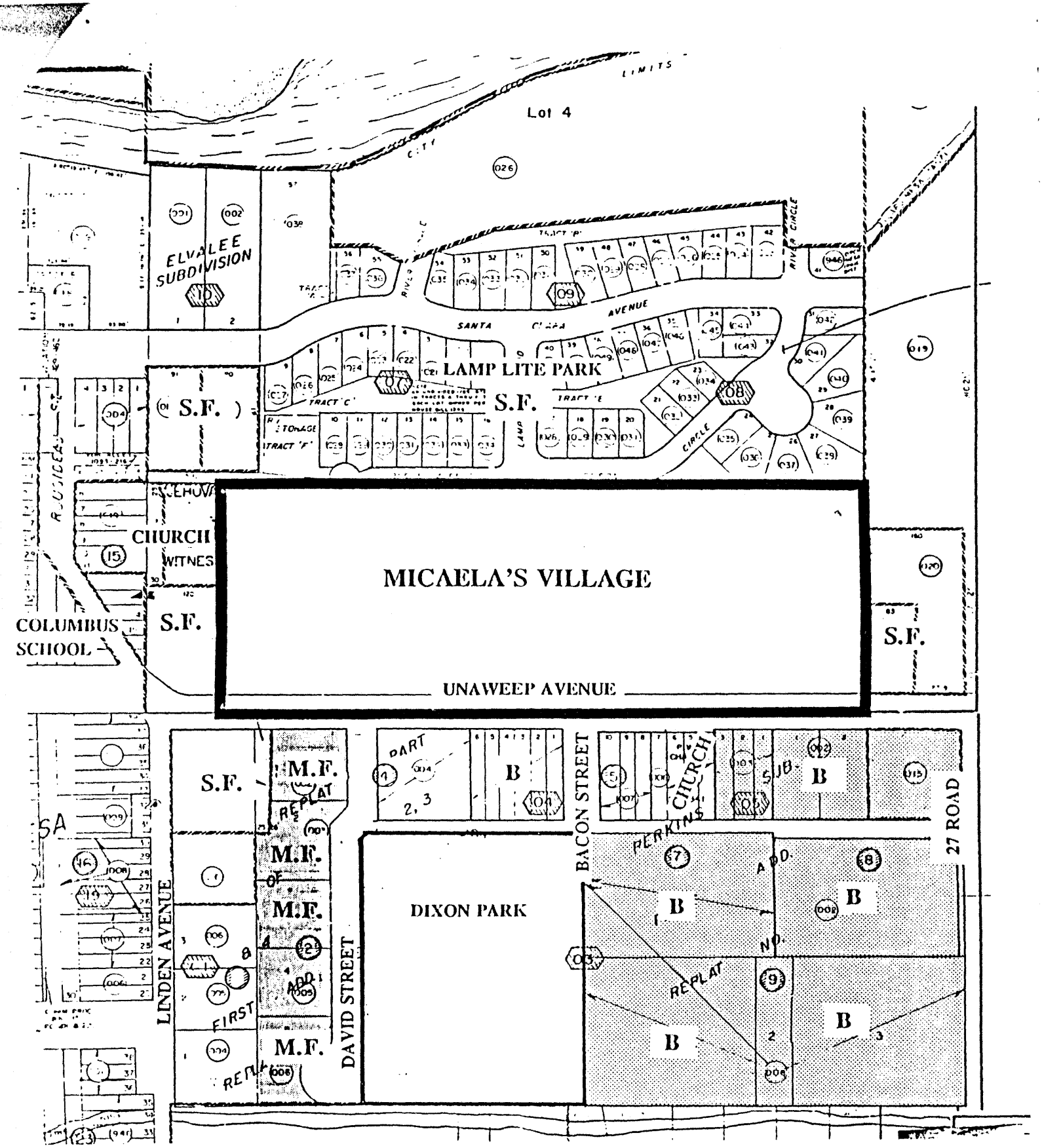
2. THE SURROUNDING AREA (SEE FIGURE 1) CONSISTS OF SINGLE FAMILY TO THE EAST, SOUTHWEST, AND NORTH. TO THE SOUTH IS LARGELY BUSINESS WITH SOME MULTI-FAMILY TO THE SOUTHWEST. A CONVENIENCE STORE AND PARK ARE DIRECTLY SOUTH OF THE PROPERTY. TWO CHURCHES AND COLUMBUS ELEMENTARY SCHOOL ARE SHORT DISTANCES FROM THE PROPERTY.

3. THE PROPOSED ACCESS TO MICAELA'S VILLAGE CONSISTS OF TWO ENTRIES ON UNAWEEP AVENUE. THE ENTRY TO THE WEST (DAVID STREET) WILL LINE UP WITH THE EXISTING DAVID STREET TO THE SOUTH.
THE ENTRY TO THE EAST (MICAELA'S STREET) WILL BE BETWEEN EXISTING BACON STREET TO THE SOUTHWEST AND 27 ROAD TO THE SOUTHEAST. ALL ROADWAYS WILL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY GRAND JUNCTION STANDARDS FOR RESIDENTIAL DEVELOPMENTS.
UNAWEEP AND 27 ROAD ARE CLASSIFIED AS COLLECTOR. OTHER ROADS MENTIONED AS WELL AS ROADS IN NEARBY LAMP LITE PARK SUBDIVISION ARE CLASSIFIED AS LOCAL STREETS.

4. ALL UTILITIES ARE READILY AVAILABLE AND ADJOINING THE PROPERTY ON THE SOUTH SIDE. WATER WILL BE EXTENDED DOWN FROM THE UTE WATER LINE WHICH CURRENTLY EXISTS IN LAMP LITE PARK SUBDIVISION (SEE UTILITY COMPOSITE PLAN). AN EXISTING 8" SEWER MAIN CROSSED THE PROPERTY PARALLEL TO THE WEST PROPERTY LINE.

5. NO SPECIAL OR UNUSUAL DEMANDS ON UTILITIES ARE ANTICIPATED AT THIS TIME.

6. ACCORDING TO REVIEW COMMENTS ON THE PRELIMINARY PHASE OF THIS DEVELOPMENT, NO ADVERSE OR INSURMOUNTABLE EFFECTS WILL BE EXPERIENCED BY ANY PUBLIC FACILITIES.



M.F. Indicates Multi-Family

S.F. Indicates Single-Family

B Indicates Business

FIGURE I
SURROUNDING LAND USE MAP

A Geologic Hazards Report has been prepared and submitted to the Grand Junction Community Development Department. The purpose of the report is to identify geologic hazards that may have an adverse effect on construction within the subject property. The conclusions and recommendations from the aforementioned report follow:

1. The potential for expansive clays that could adversely effect foundations exists in Mancos Shale and soils derived from the shale.

2. The wind-blown and alluvial soils could experience settlement under heavy loading and/or saturation.

3. Due to the topography, no flood hazard exists on this property.

4. The depth to water table should be considered in the design of any large structures or basements.

5. Mancos Shale and soils derived from the shale contain sulfate salts due to the marine origin of the Mancos. Sulfate resistant cement should be used where concrete would contact the shale or soil.

6. No landslide or erosion hazard exists on the property due to the gentle slopes (1 to 2 percent). A previous landslide 300 feet offsite to the north would undoubtedly stabilize and cease its headward advance before becoming a hazard to this parcel.

7. Commercial mineral resources of metallic or non-metallic nature are not found in the immediate area. The underlying gravel layer contains too high a percentage of silt and clay to be of value for concrete aggregate. A small possibility of the occurrence of natural gas from underlying sedimentary formations exits; the likelihood of gas is diminished by the relatively thin sequence of sedimentaries in the subsurface.

8. The area has a low probability of destructive seismic events.

DEVELOPMENT SCHEDULE AND PHASING:

THE PHASING PLAN (SEE FIGURE II) IS AS FOLLOWS:

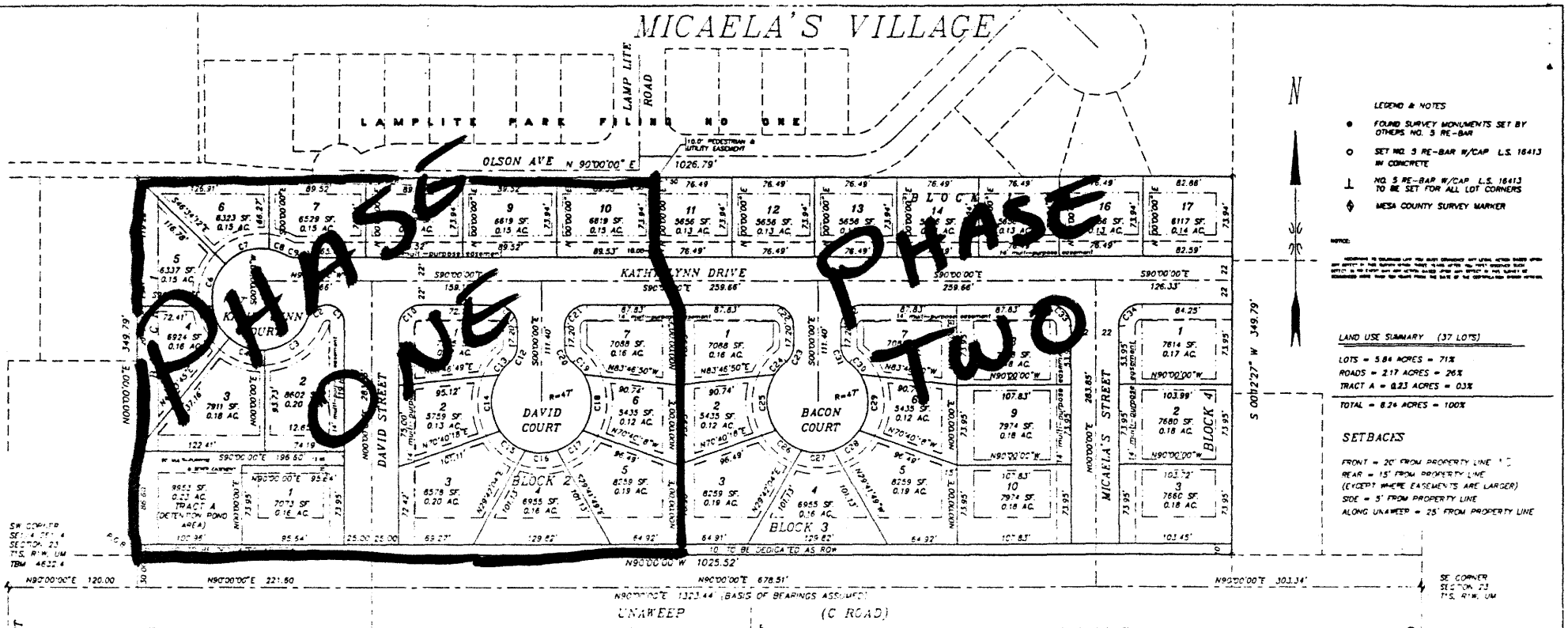
PHASE 1:

BUILD DAVID STREET, KATHY LYNN COURT, DAVID COURT, AND THAT PORTION OF KATHY LYNN DRIVE THAT WOULD SERVICE LOTS 1-10 OF BLOCK 1 AND ALL OF BLOCK 2 (17 LOTS).

PHASE 2:

FINISH THE REMAINDER.

DEVELOPMENT WILL COMMENCE AS SOON AS POSSIBLE. IT IS EXPECTED THAT THE SECOND PHASE WILL BE INITIATED IN THE SPRING OF 1996.



DEDICATION

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned, Mary Lou Kennedy, is the owner of that real property situated in the City of Grand Junction, County of Mesa, State of Colorado, and is described in Book 2151 at Pages 593 thru 595 of the Mesa County Clerk and Recorders Office, and being situated in the SE1/4 SE1/4 Section 23 Township 1 South, Range 1 West of the Ute Meridian, Mesa County, Colorado as shown on the accompanying plat, said property being additionally described as follows:

Beginning at a point being 30.00 feet N90°00'00"E and 30.00 feet N00°00'00"E of the SW corner of the SE1/4 SE1/4 Section 23, T1S, R1W, U.M. and considering the South line of the SE1/4 SE1/4 Section 23, T1S, R1W, U.M. to bear N90°00'00"E and all bearings contained herein to be relative thereto; thence N90°00'00"E 303.34 feet; thence N00°00'00"E 1029.52 feet to the SE corner of Lamplite Park Filing No. One; thence S00°12'27"W 349.79 feet; thence N90°00'00"W 1025.52 feet to the Point of Beginning, containing 8.24 Acres as described.

That said owner has caused the said real property to be laid out and surveyed as MICAELA'S VILLAGE, a subdivision of a part of City of Grand Junction, County of Mesa, State of Colorado.

That said owner does hereby dedicate and set apart real property as shown and labeled on the accompanying plat as follows:

All streets and rights-of-way as shown on the accompanying plat to the City of Grand Junction, for the use of the public forever;

All Multi-purpose easements to the City of Grand Junction for the use of the public utilities as perpetual easements for the installation, operations, maintenance and repair of utilities and appurtenances thereto including, but not limited to electric lines, cable TV lines, natural gas pipelines, sanitary sewer lines, water lines, telephone lines, and also for the installation and maintenance of traffic control facilities, street lighting, and grade structures;

All Irrigation Easements to the Property owners of the lots and tracts hereby platted as perpetual easements for the installation, operation, maintenance and repair of private irrigation systems;

All Drainage Easements to the Property owners of lots and tracts hereby platted as perpetual easements for the conveyance of runoff water which originates within the area hereby platted or from upstream areas, through natural or man-made facilities above or below ground;

All Detention/Retention Easements to the Property owners of lots and tracts hereby platted to the purpose of conveying and containing/retaining runoff water which originates from the area hereby platted, and also for the conveyance of runoff from upstream areas;

All Pedestrian/Utility Easements to the owners of lots or tracts specifically identified on the plat as perpetual easements for ingress and Egress purposes for the use by said lot or tract owners, their guests, and invitees, and also for use by public services, including but not limited to, postal service, trash collection, fire, police, emergency vehicles, and the City of Grand Junction;

All easements include the right of ingress and egress on, along, over, under, and through and across by the beneficiaries, their successors, or assigns, together with the right to trim or remove interfering trees and brush, and in Drainage and Detention/Retention easements, the right to grade; provided, however, that the beneficiaries of said easements shall utilize the same in a reasonable and prudent manner. Furthermore, the owners of lots or tracts hereby platted shall burden said easements by erecting or placing any improvements thereon which may prevent reasonable ingress and egress to and from the easement;

That all expenses for street paving or improvements shall be furnished by the seller or purchaser, not the City of Grand Junction.

IN WITNESS WHEREOF said owner has caused her name to be hereunto subscribed this _____ day of _____ A.D., 199__.

_____
Mary Lou Kennedy

STATE OF COLORADO)
) S.S.
COUNTY OF MESA)

The foregoing instrument was acknowledged before me this _____ day of _____ A.D., 199__, by Mary Lou Kennedy.

_____ _____
My commission expires: Notary Public
Address _____

CLERK AND RECORDERS CERTIFICATE

STATE OF COLORADO)
) S.S.
COUNTY OF MESA)

I hereby certify that this instrument was filed in my office at _____ o'clock ____ M. this _____ day of _____ A.D., 199__, and is duly recorded in Plat Book No. _____, Page _____

_____
Clerk and Recorder

CITY APPROVAL

This plat of MICAELA'S VILLAGE, a subdivision of the City of Grand Junction, County of Mesa, and State of Colorado was approved and accepted this _____ day of _____ A.D. 199__.

_____ _____
City Manager President of Council

SURVEYOR'S CERTIFICATE

I, Max E. Morris, certify that the accompanying plat of MICAELA'S VILLAGE, a subdivision of a part of the City of Grand Junction, County of Mesa, State of Colorado has been prepared under my direct supervision and accurately represents a field survey of same. I further certify that this plat conforms to all applicable requirements of the Zoning and Development Code of the City of Grand Junction and all applicable state laws and regulations.

_____ _____
Max E. Morris, Q.E.D. Surveying Systems Inc. Date
Colorado Registered Professional Land Surveyor L.S. 16413

CURVE TABLE

CURVE NO.	RADIUS LENGTH	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE	TANGENT LENGTH
C1	15.64'	24.57'	22.12'	S 45°00'00" E	90°00'02"	15.64'
C2	28.28'	52.66'	28.30'	S 26°56'51" E	67°44'14"	29.43'
C3	47.00'	53.11'	49.98'	S 52°59'30" E	63°31'36"	29.10'
C4	47.00'	36.48'	35.57'	S 72°00'25" E	44°28'25"	19.22'
C5	47.00'	34.17'	33.43'	N 28°56'25" E	41°39'40"	17.88'
C6	47.00'	42.28'	40.87'	N 17°39'42" E	51°32'36"	22.69'
C7	47.00'	46.21'	44.37'	N 71°36'02" E	56°20'04"	25.17'
C8	47.00'	15.70'	15.63'	S 70°39'49" E	19°08'14"	7.92'
C9	20.00'	10.09'	9.98'	S 75°32'51" E	28°54'18"	5.15'
C10	20.00'	31.42'	28.28'	N 45°00'00" E	90°00'00"	20.00'
C11	20.00'	31.42'	28.28'	S 45°00'00" E	90°00'00"	20.00'
C12	20.00'	17.87'	17.28'	N 25°35'25" W	51°10'51"	9.58'
C13	47.00'	15.29'	15.22'	N 41°51'38" E	18°38'25"	7.71'
C14	47.00'	54.92'	51.85'	N 00°56'11" E	66°57'11"	31.08'
C15	47.00'	30.53'	30.00'	S 53°01'27" E	37°13'23"	15.83'
C16	47.00'	30.13'	29.62'	N 90°00'00" E	36°43'44"	15.60'
C17	47.00'	30.53'	30.00'	S 53°01'27" W	37°13'23"	15.83'
C18	47.00'	54.92'	51.85'	N 00°56'11" E	66°57'10"	31.08'
C19	47.00'	15.29'	15.22'	N 41°51'37" E	18°38'26"	7.71'
C20	20.00'	17.87'	17.28'	N 25°35'25" W	51°10'51"	9.58'
C21	20.00'	31.42'	28.28'	N 45°00'00" E	90°00'00"	20.00'
C22	20.00'	31.42'	28.28'	S 45°00'00" E	90°00'00"	20.00'
C23	20.00'	17.87'	17.28'	S 25°35'25" W	51°10'51"	9.58'
C24	47.00'	15.29'	15.22'	N 41°51'37" E	18°38'26"	7.71'
C25	47.00'	54.92'	51.85'	N 00°56'11" E	66°57'10"	31.08'
C26	47.00'	30.53'	30.00'	S 53°01'27" E	37°13'23"	15.83'
C27	47.00'	30.13'	29.62'	N 90°00'00" E	36°43'44"	15.60'
C28	47.00'	30.53'	30.00'	S 53°01'27" W	37°13'23"	15.83'
C29	47.00'	54.92'	51.85'	N 00°56'11" E	66°57'10"	31.08'
C30	47.00'	15.29'	15.22'	N 41°51'37" E	18°38'26"	7.71'
C31	20.00'	17.87'	17.28'	N 25°35'25" W	51°10'51"	9.58'
C32	20.00'	31.42'	28.28'	N 45°00'00" E	90°00'00"	20.00'
C33	20.00'	31.42'	28.28'	S 45°00'00" E	90°00'00"	20.00'
C34	20.00'	31.42'	28.28'	N 45°00'00" E	90°00'00"	20.00'

MICAELA'S VILLAGE

FINAL PLAT

SITUATED IN THE SE1/4 SE1/4 SECTION 23, T1S, R1W, UM

FOR: RODRIGUEZ

SCALE: 1" = 50'-0"

DATE: 11-29-94

Q.E.D. SURVEYING SYSTEMS INC.
1018 COLO AVE
GRAND JUNCTION
COLORADO 81501
(303) 241-2212
464-7566

SURVEYED BY: SE MF
DRAWN BY: JAT MCW
ACAD ID: M-FIN
SHEET NO: 01 OF 01

Figure H

IMPROVEMENTS LIST/DETAIL

DATE: 1-Dec-94
NAME OF DEVELOPMENT: MICAELA'S VILLAGE
LOCATION: EAST OF LINDEN STREET & NORTH OF UNAWEEP
PRINTED NAME OF PERSON PREPARING: Terry Nichols

Note:
Cost for storm water system only

		Units	Total Quantity	Unit Price	Total Amount
I	**SANITARY SEWER**				
1	Clearing and grubbing	LS	0		$0
2	Cut and remove asphalt	S.Y.	0		$0
3	PVC sanitary sewer main (incl. trenching, bedding, & backfill)	L.F.	1,560	$15	$23,400
4	Sewer Services (incl. trenching, bedding, & backfill)	Ea.	37	$300	$11,100
5	Sanitary sewer manhole (s)	Ea.	10	$900	$9,000
6	Connection to existing manhole (s)	Ea.	0		$0
7	Aggregate Base Course	S.Y.	0		$0
8	Pavement replacement	S.Y.	0		$0
9	Driveway restoration	Ea.	0		$0
10	Utility adjustments(Drainage & irrigation crossings)	LS	0		$0
	SUB TOTAL:				**$43,500**
II	**DOMESTIC WATER**				
1	Clearing and grubbing	S.Y.	0		$0
2	Cut and remove asphalt	Ea.	0		$0
3	Water Main (incl. excavation, bedding, backfill, valves and appurtenances)	L.F.	1,620	$13	$20,250
4	Water Services (incl. excavation, bedding, backfill, valves, and appurtenances)	C.Y.	37	$400	$14,800
5	Connect to existing water line	Ea.	1	$500	$500
6	Aggregate Base Course	C.Y.	2		$0
7	Pavement Replacement	S.Y.	0		$0
8	Utility adjustments		0		$0
	SUB TOTAL:				**$35,550**
III	**STREETS**				
1	Clearing and grubbing		0		$0
2	Earthwork, including excavation and embankment construction	C.Y.	5,000	$2	$10,000
3	Utility relocations	Ea.	0		$0
4	Aggregate sub-base course (cubic yard)	C.Y.	1,700	$6	$10,200
5	Aggregate base course (cubic yard)	C.Y.	1,200	$8	$9,600
6	Sub-grade stabilization	Ea.	1	$2,000	$2,000
7	Asphalt or concrete pavement (sq yd)	S.Y.	6,300	$10	$63,000
8	Curb, gutter & sidewalk (linear feet)	L.F.	2,400	$19	$45,600
9	Driveway sections (square yard)	S.Y.	0		$0
10	Crosspans and fillets	Ea.	13	$250	$3,250
11	Retaining walls/structures	Ea.	0		$0
12	Storm drainage system	L.S.	1	$35,000	$35,000

NEED TO INCLUDE OLSON ST.

13	Signs and other traffic control devices	Ea.	8	$200	$1,600
14	Construction staking	L.S.		$5,000	$5,000
15	Dust control	L.S.	1	$1,000	$1,000
16	Street lights (each)	Ea.	2	$1,000	$2,000
	SUB TOTAL:		111		**$188,250**
IV	**LANDSCAPING**				
1	Design/Architecture				
2	Earthwork (includes top soil, fine grading, and berming				
3	Hardscape features (includes walls, fencing, and paving)				
4	Plant material and planting				
5	Irrigation system				
6	Other features (incl. statues, water displays, park equipment, and outdoor furniture				
7	Curbing				
8	Retaining walls and structures				
9	One year maintenance agreement				
V	**MISCELLANEOUS**				
1	Design/ Engineering	%		12%	$32,076
2	Surveying	%		8%	$21,384
3	Developer's inspection costs	%		2%	$5,346
4	Quality control testing	%		5%	$13,365
5	Construction traffic control				$0
6	Rights-of-way/Easements				$0
7	City inspection fees	%		0.2%	~~$535~~ $1100
8	Permit fees				
9	Recording costs				
10	Bonds				
11	Newsletters				
12	General Construction Supervision				
13	Other: As-built Drawings				$2,000
14	Other -Testing				$10,000
	TOTAL ESTIMATED COST OF IMPROVEMENTS:				**$352,006**

Original Do NOT Remove From Office

$535 (2)

SIGNATURE OF DEVELOPER _____ DATE _____

(If corporation, to be signed by President and attested to by Secretary together with the corporate seals.) _____

I have reviewed the estimated costs and time schedule shown above and based on the plan layouts submitted to date and the current costs of construction, I take no exception to the above.

CITY ENGINEER _____ DATE _____

COMMUNITY DEVELOPMENT _____ DATE _____

Micaela's Village Drainage Report

29 - July - 94

I. General Location and Description

The Micaela's Village project is located in the city of Grand Junction, Colorado.

The property is bounded on the east and west by existing residential property. It is bounded on the north side by Olson Avenue and Lamp Light Subdivision and on the south by Unaweep Avenue.

II. Existing Drainage Conditions

The present ground cover consists of the remains of an irrigated alfalfa field which is now dry and turned to native grass and weeds. The surface soil type is predominantly medium silt. Waste water presently drains to an existing 10" culvert near the south west corner of the property.

There is no off site drainage entering the property .

For additional information see the attached Armstrong Engineers Drainage report for this property.

III. Proposed Drainage Conditions

As shown on the preliminary plan, there will be a detention facility in the south west corner of the property. The streets and short drainage pipes will convey the storm water to the detention facility.

The detention facility will include a two-stage controlled outlet and a spillway overflow. The control structure will consist of a concrete box open at the top to allow discharge of the 100 year historic flow at the design elevation. The head on the weir (top of the structure) will force the maximum pond elevation to the 100 year storm storage level.

A rectangular orifice is to be constructed in the front of the structure to allow the 2 year historic flow to discharge at the design elevation. The front of the structure is to be fitted with an orifice and head gate to drain the irrigation storage portion of the pond.

The detention pond will drain at the historic discharge rate to the existing storm 10" storm and waste water drain.

IV. Design Criteria & Approach

Design rainfall intensities are taken from the City of Grand Junction Stormwater Management Manual, dated June 1994 . The time of concentration for each basin is calculated using combinations of overland flow, channel flow and pipe flow travel time.

The following formula is used to calculate overland sheet flow:

$$t_c=1.8(1.1-C)\,(L^{1/2})/100S)^{1/3}$$

where:

t_c= time of concentration in minutes;
C= runoff coefficient;
L= length of basin in feet; and
S= slope of the basin in feet/feet.

The intensity is taken from APPENDIX A of the Interim Outline Of Grading And Drainage Criteria.

For on site development, the peak runoff discharges are calculated using the rational formula:

$$Q=CiA$$

where:

Q= peak runoff rate in cubic feet per second (CFS);
C= runoff coefficient representing a ratio of peak runoff to average rainfall intensity for a duration equal to the runoff time of concentration;
i= average rainfall intensity in inches per hour; and
A= drainage area in acres

All hydrology and Hydraulics calculations will conform with methods outlined in the City of Grand Junction SWMM manual and will be a part of the final drainage plan and report.

MICAELA'S VILLAGE
DRAINAGE REPORT

Micaela's Village encompasses 9 acres consisting of approximately 90% fallow ground and 10% developed land (4 mobile homes and a residential structure). A composite runoff coefficient of C = 0.40 is assumed for this existing condition. A developed coefficient of C = 0.50 is assumed for the proposed subdivision.

Ground slopes in the vicinity are generally to the southwest at 0.5%. Offsite runoff does not affect the project. The adjacent property to the north (Lamplite Park) discharges north to the river and the adjacent property to the east discharges south to C Road. Site observations reveal that portions of C Road are very flat in relation to the shoulders and adjacent ground to the north (especially in the vicinity of the southeast corner of the project). This indicates that runoff from northeastern offsite basins would not be deflected west by C Road but would more likely sheet flow across the roadway and continue in a southwesterly direction.

Stormwater runoff and irrigation tailwater from the site has historically been discharged from the southwest corner of the site into an existing 10" culvert. This culvert is located at the driveway approximately 50' west of the southwest property corner. It runs diagonally under the intersection of C Road and Linden Avenue where it discharges into an existing ditch sloping west along the south side of C Road. At a slope of 0.6%, this pipe has a capacity of approximately 1.0 CFS when full.

The Rational Method was used to calculate stormwater runoff:

A = 9.0 Acres

Historic: C = 0.40

Tc = Overland for 1100' @ S = 0.6%

$Tc = 1.8\ (1.1-0.40)\ (1100)^{1/2}/(0.6)^{1/3} = 50$ min.

$I_{10} = 1.05$ $I_{100} = 1.65$

$Q_{10} = 0.40\ (1.05)\ (9.0) = 3.8$ CFS

$Q_{100} = 0.40\ (1.65)\ (9.0) = 5.9$ CFS

Developed: C = 0.50

Tc = Overland for 120′ @ S = 0.6% + 1200′ Gutter Flow @ 2.5 ft./sec.
Tc = 14 + 8 = 22 min.

I_{10} = 1.70 I_{100} = 2.70

Q_{10} = 0.50 (1.70) (9.0) = 7.6 CFS
Q_{100} = 0.50 (2.70) (9.0) = 12.2 CFS

Stormwater detention is recommended given the increase in runoff developed by the proposed subdivision, the low capacity of the discharge culvert, and the flat surrounding street grades. The enclosed calculations show a need for approximately 13,000 cubic feet of storage assuming a 10 year frequency storm for 1/2 hour, an outlet discharge of 1.0 CFS, and a desire to not exceed the culvert capacity. This approach actually reduces peak discharge to values below historic flowrates. The storage volume has been approximated (by average end area method) to be contained within the proposed elevation 4632 contour as shown on the grading plan. Storage to this elevation would create street ponding to the top of curb in the southwest corner of the project.

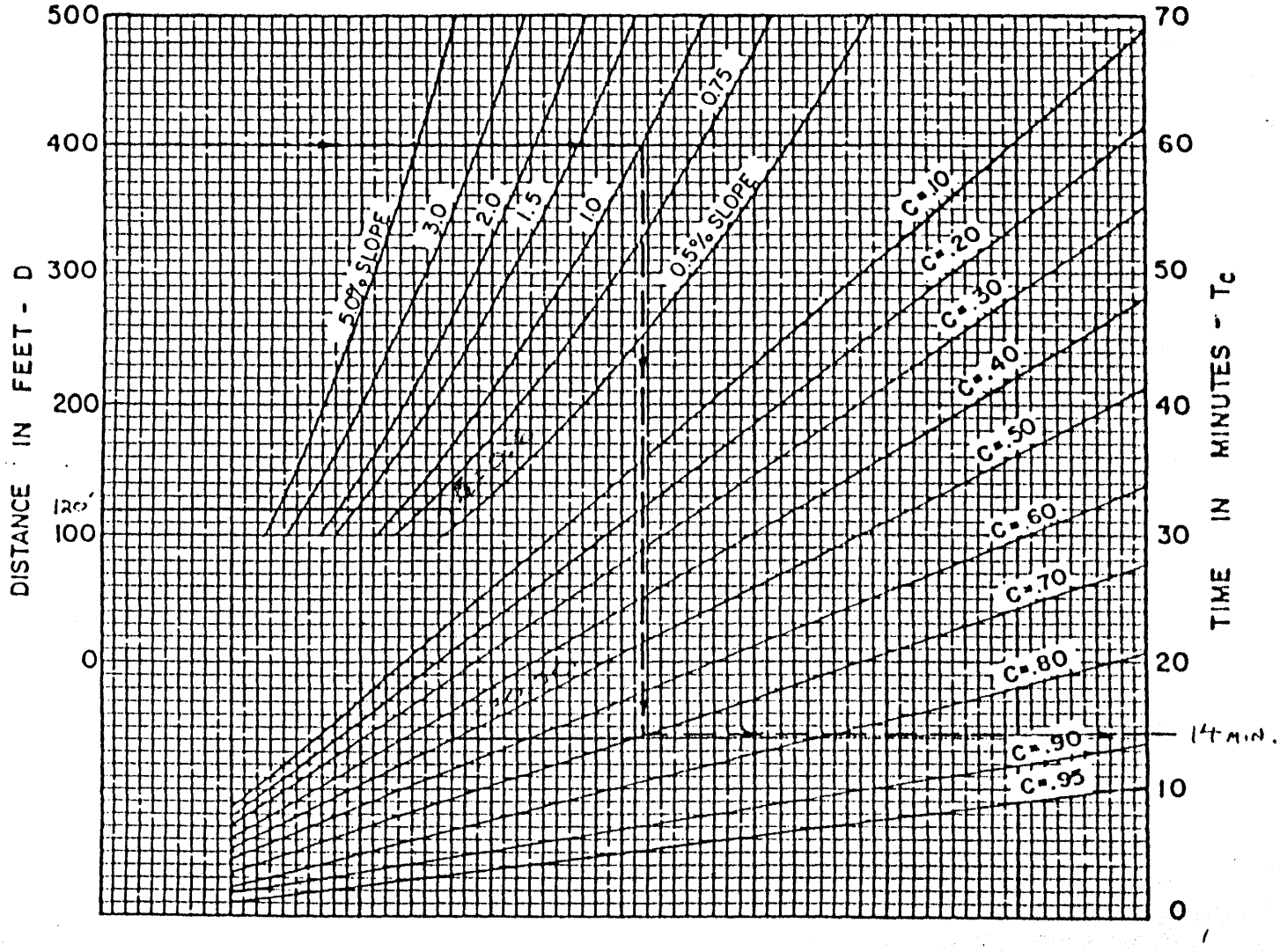
APPENDIX

RUNOFF COEFFICIENTS FOR RATIONAL METHOD

LAND USE OR SURFACE CHARACTERISTICS	PERCENT IMPERVIOUS	C, Runoff Coefficients FREQUENCY 2	5	10	100
Business:					
Commercial Areas	95	.87	.87	.88	.89
Neighborhood Areas	70	.60	.65	.70	.80
Residential:					
Single-Family DEVELOPED	40	.40	.45	(.50)	.60
Multi-Unit (detached)	50	.45	.50	.60	.70
Multi-Unit (attached)	70	.60	.65	.70	.80
½ Acre Lot or Larger	30	.30	.35	.40	.60
Apartments	70	.65	.70	.70	.80
Industrial:					
Light Areas	80	.71	.72	.76	.82
Heavy Areas	90	.80	.80	.85	.90
Parks, Cemeteries: HISTORIC (COMPOSITE)	7	.10	.10	(.35)	.60
Playgrounds:	13	.15	.25	.35	.60
Schools:	50	.45	.50	.60	.70
Railroad Yard Areas:	40	.40	.45	.50	.60
Undeveloped Areas:					
Historic Flow Analysis-	2	(See "Lawns")			
Greenbelts, Agricultural HISTORIC (COMPOSITE)					
Offsite Flow Analysis (when land use not defined)	45	.43	.47	(.55)	.65
Streets:					
Paved	100	.87	.88	.90	.93
Gravel	13	.15	.25	.35	.65
Drive and Walks:	96	.87	.87	.88	.89
Roofs:	90	.80	.85	.90	.90
Lawns, Sandy Soil:	0	.00	.01	.05	.20
Lawns, Clayey Soil:	0	.05	.10	.20	.40

MICAELA'S VILLAGE - O.M.

TIME OF CONCENTRATION ≃ T_c
FOR OVERLAND FLOW



BASED ON EQUATION

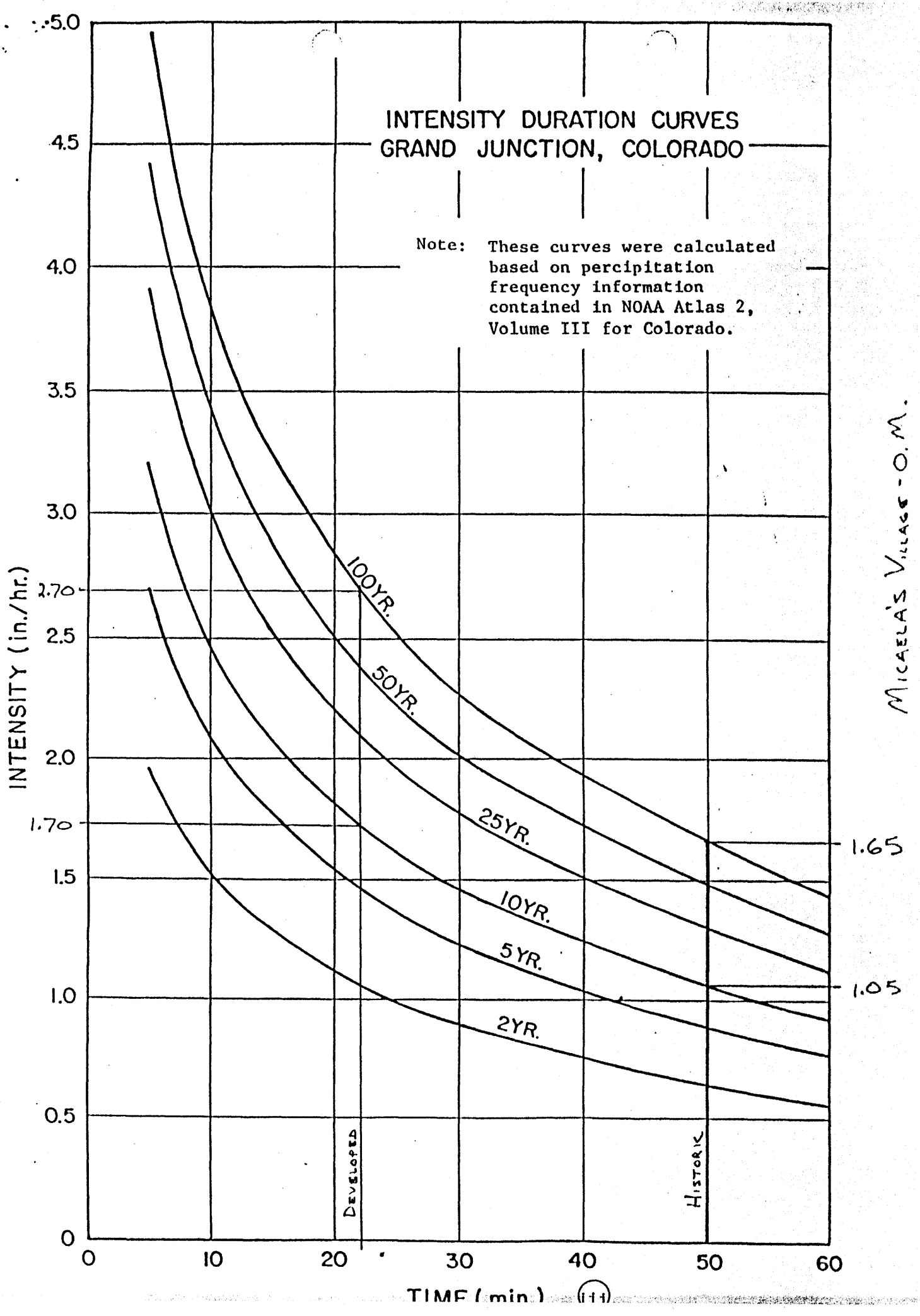
$$T_c \approx \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{S}}$$

C = Coefficient of runoff
D = Distance of flow in feet
S = Slope in %

EXAMPLE

D = 400'
S = 1%
C = 0.70
T_c = 15 Minutes

MICAELA'S VILLAGE - O.M.


INTENSITY DURATION CURVES
GRAND JUNCTION, COLORADO
Note: These curves were calculated based on percipitation frequency information contained in NOAA Atlas 2, Volume III for Colorado.
INTENSITY (in./hr.)
TIME (min.)
100YR.
50YR.
25YR.
10YR.
5YR.
2YR.
2.70
1.70
1.65
1.05
DEVELOPED
HISTORIC
0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
10
20
30
40
50
60
MICAELA'S VILLAGE - O.M.

ARMSTRONG CONSULTANTS, INC.

PROJECT: MICAELA'S VILLAGE - O.M.

TITLE: DRAINAGE / DETENTION VOLUME CALCULATIONS

PROJECT NUMBER: 905345

SHEET NO. 1 OF 1

DATE: 10/25/90

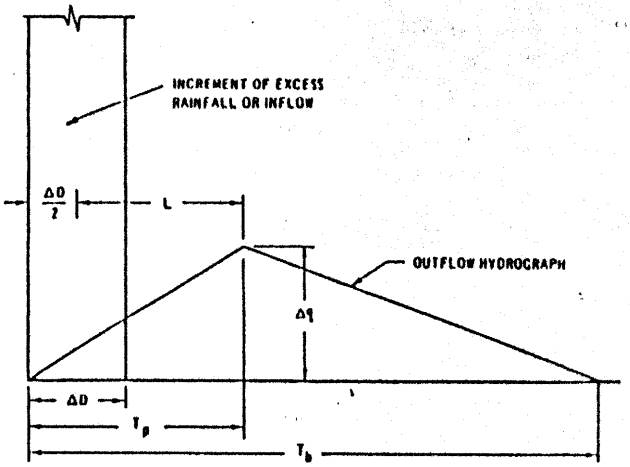
PREPARED BY: PMO

WATERSHED LAG AND TIME OF CONCENTRATION

The average slope within the watershed together with the overall length and retardance of overland flow are major factors affecting the runoff rate through the watershed.

Time of concentration (T_c) is the time it takes for water to travel from the most hydraulically distant point in a watershed to its outlet. Lag (L) can be considered as a weighted time of concentration. When runoff from a watershed is nearly uniform it is usually sufficient to relate lag to time of concentration as follows:

$$L = 0.6\ T_c \qquad (5)$$



$\Delta q = \frac{(\Delta Q)(A)(640)}{\frac{\Delta D}{2} + L}$ in C.F.S. = Q_{10} by rational method

Where:

- ΔD = INCREMENT OF STORM PERIOD IN HOURS = 1/2 hour
- ΔQ = RUNOFF IN INCHES DURING PERIOD ΔD
- Δq = PEAK DISCHARGE IN C.F.S. FOR AN INCREMENT OF RUNOFF
- A = DRAINAGE AREA IN SQUARE MILES
- T_p = TIME TO PEAK ($= \frac{\Delta D}{2} + L$) IN HOURS
- T_b = TIME OF BASE ($= 2.67\ T_p$) IN HOURS

Figure 5.--Triangular hydrograph relationships.

ΔD = 30 MINUTES (GIVEN BY CITY OF G.J.)

$\Delta q = Q_{10}$ = 7.6 CFS (" " ")

$L = 0.6\ T_c = 0.6(22\text{ MIN.}) = 13.2$ MIN.

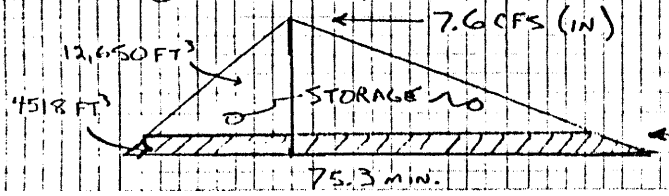
$T_P = \Delta D/2 + L = 15 + 13.2 = 28.2$ MINUTES

$T_B = 2.67\ T_P = 2.67(28.2) = 75.3$ MINUTES

$\therefore$ INFLOW VOLUME $= \frac{1}{2}(T_B)(\Delta q) = \frac{1}{2}(75.3\text{ MIN.})(7.6\text{ FT}^3/\text{SEC.})(60\text{ SEC./MIN.})$

$= 17{,}168\ \text{FT}^3$

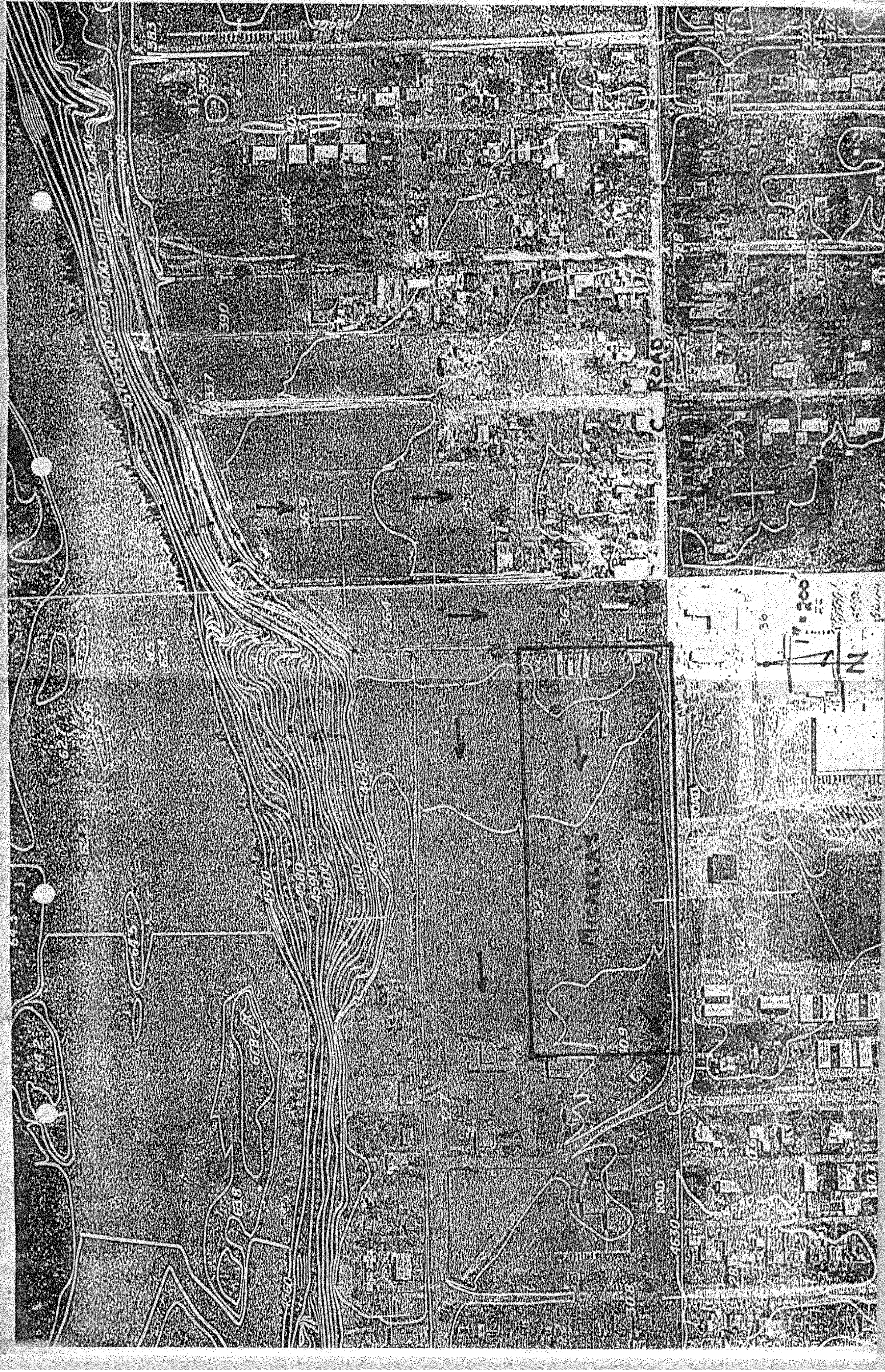
OUTFLOW VOLUME:



VOLUME OUT: 1 CFS FOR 75 MINUTES = 4518 FT³

STORAGE REQ'D = IN - OUT = 12,650 FT³

1.0 CFS (OUT) = CAPACITY OF EXISTING 10" CULVERT


ROAD
ROAD
ROAD
1" = 200'
N
4570
4580
4590
4600
4610
4620
4630
4510
4580
4590
4600
4610

Sandra K. Warner
1161 Santa Clara Avenue
Grand Junction, CO 81503

September 6, 1994

Mr. Tom Dixson, Planner
City of Grand Junction
Community Development
250 N. 5th Street
Grand Junction, CO 81501

Dear Tom:

I am unable to attend the public hearing which is to be held tonight in the City/County Auditorium, but as a homeowner in Lamplite Subdivision, I feel it is important to let you know my views on the proposed subdivision entitled Micaela's Village.

One of the things that was appealing to me when I purchased my home in Lamplite was the fact that there was no exit from Lamplite Subdivision itself to a main thoroughfare such as Unaweep Avenue. One would have to exit Lamplite Subdivision on to Unaweep through Roubideau Street and there would be no through traffic in the subdivision.

However, if Micaela's subdivision goes through in the way that it is being proposed now, Lamplite will no longer have its quiet, out of the way little subdivision.

I realize, as the developer states in his proposal, that a new subdivision in that open field which runs off of Unaweep would be more appealing than the existing weeds, but not to me if Lamplite is not somehow separated from Micaela's Village.

Again, if I may reiterate, I strongly oppose Micaela's Village as it is currently being proposed.

Sincerely,

Sandra K. Warner

Sandra K. Warner

GEOTECHNICAL REPORT

Lincoln DeVore, Inc.
Geotechnical Consultants
1441 Motor St.
Grand Junction, CO 81505

TEL: (303) 242-8968
FAX: (303) 242-1561

November 30, 1994

Mr. Lloyd Rodriquez
P.O. Box 4146
Grand Junction, Colorado 81502

Re: Micaela's Village, Pavement Sections
Grand Junction, CO.

At the request of Mr. Rodriquez, the proposed subgrade of the roadways within Micaela's Village Subdivision was sampled by personnel of LINCOLN-DeVORE, INC.. The samples were subjected to Laboratory Testing and appropriate road sections were computed. Following are our findings and recommendations.

Samples of the surficial native soils at this property that may be required to support pavements have been evaluated using the Hveem-Carmany method (ASTM D-2844) to determine their support characteristics. The results of the laboratory testing are as follows:

AASHTO Classification - A-5(9) Unified Classification - CL

R =	< 5
Sample exuded during compaction	
Expansion @ 300 psi =	0.7
Displacement @ 300 psi =	3.85

No estimates of traffic volumes have been provided to Lincoln DeVore. However, we assume that the roads will be classified as residential. The design procedures utilized are those recognized by the Colorado Department of Highways and the 1986 AASHTO design procedure.

Based upon the existing topography, the anticipated final road grades and the anticipated future irrigation practices in the local area, a Drainage Factor of 0.7 (1986 AASHTO procedure) has been utilized for the section analysis.

PROPOSED PAVEMENT SECTIONS

Based on the soil support characteristics outlined above, the following pavement sections are recommended:

Residential Roadway, 18k EAL = 5 :

The terminal Serviceability Index of 2.0, a Reliability of 70 and a design life of 20 years have been utilized, based on recommendations by the Highway Department. An 18 kip EAL of 5, also recommended by the Highway Department, was used for the analysis.

Asphalt-Base Coarse

3 inches of asphaltic concrete pavement
on 13 inches of aggregate base coarse
on 8 inches of recompacted native material

OR

3 inches of asphaltic concrete pavement
on 6 inches of aggregate base coarse
on 8 inches of aggregate subbase ('Pit-Run')
on 8 inches of recompacted native material

Full Depth Asphalt:

7 inches of asphaltic concrete pavement
on 12 inches of recompacted native material

Rigid Concrete:

Doweled, not tied to shoulder slabs or curbing

6 inches of portland cement pavement
on 4 inches of aggregate base coarse
on 8 inches of recompacted native material

Due to the possibility of very high soil moisture in some portions of the subgrade soils, the use of a Geotextile Fabric for separation and minor reinforcement (such as Mirafi 500-X or 140-N), placed beneath the Aggregate Base Course, may be required in some areas on this site.

PAVEMENT SECTION CONSTRUCTION

We recommend that the asphaltic concrete pavement meet the State of Colorado requirements for a Grade C mix. In addition, the asphaltic concrete pavement should be compacted to a minimum of 95% of its maximum Hveem density. The aggregate base coarse should meet the requirements of State of Colorado Class 5 or Class 6 material, and have a minimum R value of 78. We recommend that the base coarse be compacted to a minimum of 95% of its maximum Modified Proctor dry density (ASTM D-1557), at a moisture content within + or -2% of optimum moisture. The native subgrade shall be scarified and recompacted to a minimum of 90% of their maximum Modified Proctor day density (ASTM D-1557) at a moisture content within + or -2% of optimum moisture.

All pavement should be protected from moisture migrating beneath the pavement structure. If surface drainage is allowed to pond behind curbs, islands or other areas of the site and allowed to seep beneath pavement, premature deterioration or possibly pavement failure could result.

Concrete Pavement

We recommend that the rigid concrete pavement have a minimum flexural strength (F_t) of 650 psi at 28 days. This strength requirement can be met using Class P or AX or A or B Concrete as defined in Section 600 of the Standard Specifications for Road and Bridge Construction, Colorado DOT. It is recommended that field control of the concrete mix be made utilizing compressive strength criteria.

Flexural Strength should only be used for the design process. Concrete with a lower flexural strength may be allowed by the agency having jurisdiction however, the design section thicknesses should be confirmed. In addition, the final durability of the pavement should be carefully considered.

Control joints should be placed at a minimum distance of 12 feet in all directions. If it is desired to increase the spacing of control joints, then 66-66 welded wire fabric should be placed in the mid-point of the slab. If the welded wire fabric is used, the control joint spacing can be increased to 40 feet. Construction joints designed so that positive joint transfer is maintained by the use of dowels is recommended.

The concrete should be placed at the lowest slump practical for the method of placement. In all circumstances, the maximum slump

should be limited to 4 inches. Proper consolidation of the plastic concrete is important. The placed concrete must be properly protected and cured.

It is believed that all pertinent points have been addressed. If any further questions arise regarding this project or if we can be of any further assistance, please do not hesitate to contact this office at any time.

Respectfully Submitted,

LINCOLN DeVORE, Inc.

by: Edward M. Morris EIT Reviewed By: George D. Morris, PE
Engineer/Western Slope Manager

LD Job No.: 81837-J

Micaela's Village
Final Drainage Report

prepared 1 March 1995

by

Nichols Associates, Inc.
751 Horizon Ct Suite 102
Grand Junction, CO

I. GENERAL LOCATION AND DESCRIPTION

A. Site and Major Basin Location

The property for the proposed Micaela's Village development is located in the area locally known as Orchard Mesa, south of the city of Grand Junction in the County of Mesa, State of Colorado. The proposed development is in the southeast quarter of section 23, Township 1 South, Range 1 West of the Ute Meridian, and given the parcel identification numbers of 2945-234-00-017. The property is currently undeveloped and no streets are located inside the property. Lamp Lite Park Filing One is neighboring to the north, several residences and a church bound the property on the east and west sides, and Unaweep Avenue borders the south margin. No other developments bound the property.

B. Site and Major Basin Description

The total area of the property is 8.00 acres. The present ground cover consists of abandoned alfalfa and native grasses. Soils on the property are mostly sandy loam with gravel. The property was at one time irrigated but the water supply is no longer used on the property.

II. EXISTING DRAINAGE CONDITIONS

A. Major Basin/Site

For the purpose of this report, the major basin is considered to be the boundary of the property. Inflow onto the property is diverted through a system of abandoned irrigation ditches (Figure 1), therefore the major basin does not receive appreciable inflow from

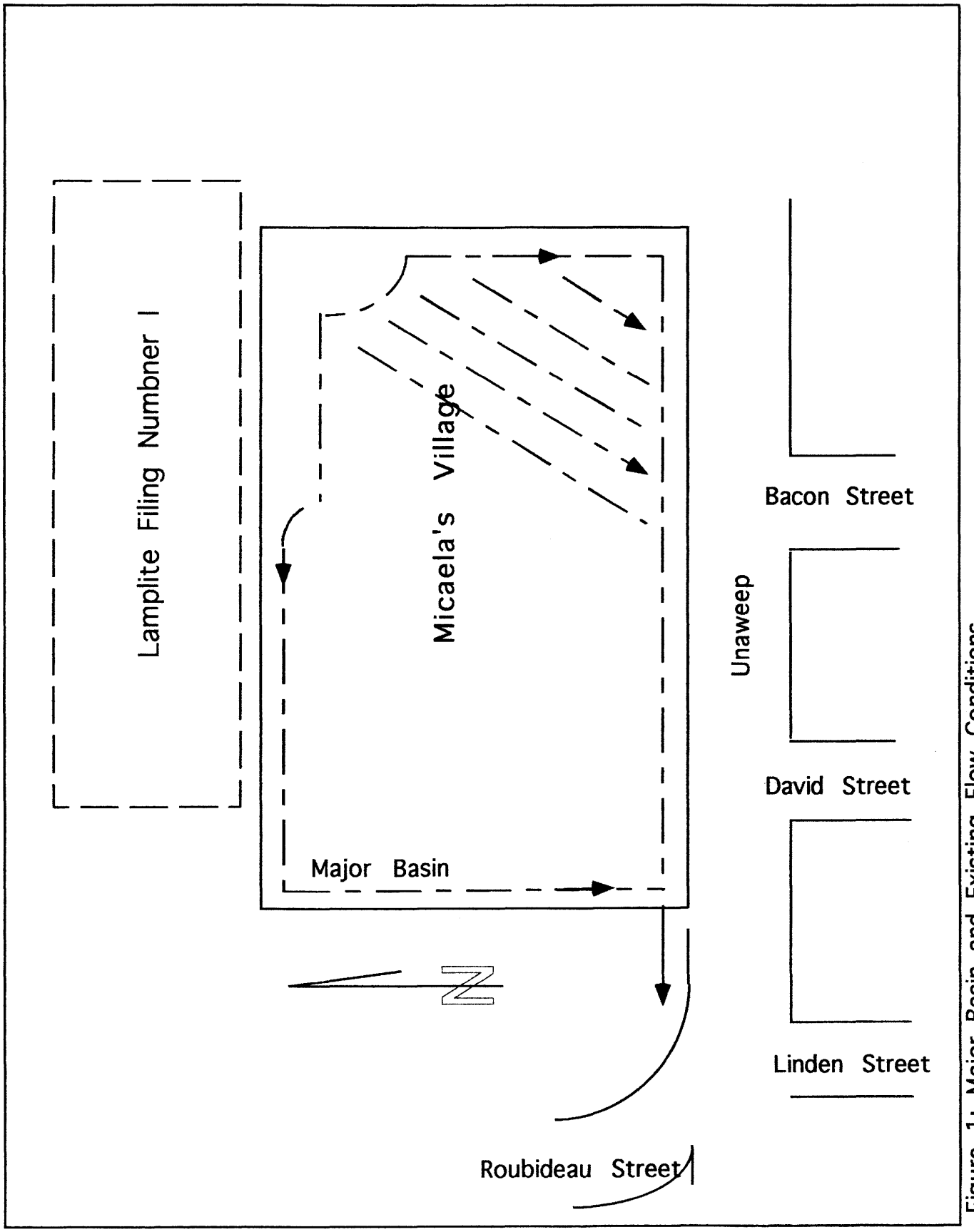


Figure 1: Major Basin and Existing Flow Conditions

adjacent properties. Currently, runoff is discharged at the southwest corner of the property into a ditch that conveys the water to a 10" culvert under Unaweep Avenue at Roubideau Street. The current culvert is undersized for a 100 year event.

The property is zoned X (i.e. outside of the 500 year floodplain) by the National Flood Insurance Program. Though the Flood Insurance Rate Maps (FIRMs) do not necessarily identify all areas subject to flooding, no local features have been identified to suggest the FIRM is incorrect.

III. PROPOSED DRAINAGE CONDITIONS

A. Changes in Drainage Patterns

Development of the property will result in an increased peak discharge and decreased time of concentration. The present conveyance system is inadequate to transport the historical two year event. The proposed drainage plan is to route all stormwater in the property directly to the Colorado River without detention.

B. Maintenance Issues

The drainage system will be located within dedicated easements to insure access to all parts of the system. A homeowners association will be formed to accept responsibility of maintenance of the drainage system. Maintenance of the system will include:

- aesthetic maintenance,
- nuisance maintenance, and
- operations and structural maintenance.

The association will perform periodic inspections of the system and make necessary adjustments and repairs as well as maintain appropriate records of repairs.

IV. DESIGN CRITERIA & APPROACH

A. General Considerations

Runoff quantities were calculated for Lamp Lite Park prior to its construction. The calculated discharge rates for Lamp Lite Park included a section of the subdivision that was not constructed, therefore those rates were not used for comparison rate at Micaela's Village. Because there is no stormwater discharged into Lamp Lite Park, there is no impact to that developments stormwater system. The primary constraint for the design of the drainage system for the proposed development is obtaining adequate grade while maintaining necessary utility cover depths.

C. Hydrological Criteria

The two year and one hundred year events, as illustrated in the City of Grand Junctions' Stormwater Management Manual (SWMM), were used as design rainfall parameters. The 24 hour event was used as the design rainfall. The Modified Rational Method was used to calculate runoff rates and quantities. Detention basin calculations were not performed.

The site was inspected on October 25th 1994. Soil types, ground cover, slope, and drainage characteristics were recorded. Rational method runoff coefficients were selected from Table "B-1" in the SWMM for historical and proposed conditions. Proposed conditions were calculated using weighted averages (see appendix).

D. Hydraulic Criteria

Hydraulic design calculations were performed using methods accepted by practicing engineers and adopted by the City of Grand Junction. Mannings Equation was used to calculate pipe hydraulics. The nomograph solution of Mannings Equation, and proportional properties of conduits flowing partially full were used to iterate solutions with known constraints (i.e. given y/D, Q, etc.). The SWMM was used to select design methods to achieve historical discharge requirements.

Analysis was performed as follows:

- Q given
- select pipe dia.
- solve for Area
- solve for Hydraulic Radius with y/D
- solve for S given minimum V
- solve for V at 100 year Q
- select S
- select pipe dia.
- solve for V and Q

The above steps were iterative and performed until a suitable pipe size and slope was determined.

V. RESULTS AND CONCLUSIONS

A. Runoff Rates for 2 and 100 year storm

- Runoff rates will change as follows:

	2 year event	100 year event
existing total site runoff rates	1.69 cfs	5.36 cfs
proposed total site runoff rates	4.86 cfs	14.80 cfs

- The existing storm drainage conveyance system can not adequately convey runoff produced from the historic 2 year event.
- Runoff will be conveyed with curb and gutter while in the boundary of the proposed development.
- A 24 inch storm sewer will transport stormwater from the development to the Colorado River. Detention is not necessary since the receiving basin will not be affected by increased discharge rate.

B. Overall Compliance

The proposed drainage design conforms with city policy and standards. The proposed drainage system will provide relief for a currently overburdened drainage pathway.

VI. APPENDICES

- Drainage Area Calculations
- Modified Rational Method Discharge Calculations

  Proposed

  Historical
- Street Flow Depth at the Gutter For Critical Sections
- Nomograph Solutions for Velocity in Pipe
- Typical Iteration for Pipe Sizing

MICAELA'S VILLAGE
DRAINAGE AREAS

SUBBASIN	NO. OF LOTS	TOTAL AREA (SF/ACRES)	LOT AREA (SF/ACRES)	STREET AREA (SF/ACRES)	BUILDING AREA (SF/ACRES)	TOTAL AREA IMPERVIOUS (SF/ACRES)	TOTAL AREA LANDSCAPED (SF/ACRES)	% IMPERVIOUS	(% ERROR)
A	6	62353	47747	14606	13500	28106	34247		
		1.43	1.10	0.34	0.31	0.65	0.79	45%	0.00%
B	7	63318	51459	11859	15750	27609	35709		
		1.45	1.18	0.27	0.36	0.63	0.82	44%	0.00%
C	7	70476	53339	17139	15750	32889	37587		
		1.62	1.22	0.39	0.36	0.76	0.86	47%	0.00%
D	5	37284	29320	7964	11250	19214	18070		
		0.86	0.67	0.18	0.26	0.44	0.41	52%	0.00%
E	5	40443	31801	8642	11250	19892	20551		
		0.93	0.73	0.20	0.26	0.46	0.47	49%	0.00%
F	7	74801	63209	11592	15750	27342	47459		
		1.72	1.45	0.27	0.36	0.63	1.09	37%	0.00%
Totals	37	348675	276875	71802	83250	155052	193623		
		8.00	6.36	1.65	1.91	3.56	4.44		

NOTES:

TOTAL AREAS, LOT AREAS, AND STREET AREAS WERE DERIVED FROM AUTOCAD DRAWING AND SURVCAD AREA CALCULATIONS , AND INPUT AS SQUARE FEET. 1 ACRE = 43560 SF

BUILDING AREA = NUMBER OF LOTS * 2250 SF

TOTAL AREA IMPERVIOUS = STREET AREA + BUILDING AREA

% IMPERVIOUS = TOTAL AREA IMPERVIOUS / TOTAL AREA

% ERROR = (LOT AREA + STREET AREA)/TOTAL AREA

Nichols Associates, Inc.
751 Horizon Drive Suite 102

Grand Junction, CO 81506

MICAELA'S VILLAGE - Drainage Study

1-Mar-95

CALCULATION OF INCREASE IN DISCHARGE DUE TO PROPOSED CONSTRUCTION

After Construction {Area - Intensity - Discharge}

BASIN	AREA		RUNOFF	RUNOFF			SLOPE		2-Yr	100-Yr	INTENSITY		DISCHARGE	
	SURFACE TYPE	Ac.	COEF. C2	COEF. C100	REACH	LENGTH FEET	(S) %	V Ft./Sec	TIME MIN.	TIME MIN.	Inches/Hour 2-Yr	Inches/Hour 100-Yr	CFS (Q=CiA) 2-Yr	CFS (Q=CiA) 100-Yr
	Landscaped	0.79	0.25	0.35	A-1	110	1.0	0.15	16.0	14.2				
A	Paved & Roofs	0.65	0.90	0.95	A-2	1 081	0.6	3.00	6.0	6.0				
	Total/Average	1.44	0.54	0.62					22.1	20.2	1.05	2.84	0.82	2.54
	Landscaped	0.82	0.25	0.35	B-1	140	1.0	0.13	18.1	16.0				
B	Paved & Roofs	0.63	0.90	0.95	B-2	763	0.6	3.00	4.2	4.2				
	Total/Average	1.45	0.53	0.61					22.3	20.2	1.05	2.84	0.81	2.51
	Landscaped	0.86	0.25	0.35	A-1	140	1.0	0.13	18.1	16.0				
C	Paved & Roofs	0.76	0.90	0.95	A-2	503	0.6	1.50	5.6	5.6				
	Total/Average	1.62	0.55	0.63					23.7	21.6	1.00	2.70	0.90	2.76
	Landscaped	0.41	0.25	0.35	A-1	65	1.0	0.19	12.3	10.9				
D	Paved & Roofs	0.44	0.90	0.95	A-2	885	0.6	1.50	9.8	9.8				
	Total/Average	0.85	0.59	0.66					22.2	20.7	1.05	2.77	0.52	1.56
	Landscaped	0.47	0.25	0.35	A-1	65	1.0	0.19	12.3	10.9				
E	Paved & Roofs	0.46	0.90	0.95	A-2	540	0.6	1.50	6.0	6.0				
	Total/Average	0.93	0.57	0.65					18.3	16.9	1.17	3.07	0.62	1.85
	Landscaped	1.09	0.25	0.35	A-1	40	1.0	0.24	9.7	8.5				
F	Paved & Roofs	0.63	0.90	0.95	A-2	400	0.6	3.00	2.2	2.2				
	Total/Average	1.72	0.49	0.57					11.9	10.8	1.41	3.66	1.18	3.59
												Sub-Total:	4.86	14.80
												Off site drainage:	0.00	0.00
Total Ac./weighted C		8.01	0.51	0.62				MAX. Tc	23.7	21.6		TOTAL Q:	4.86	14.80

Historic {Area - Intensity - Discharge}

BASIN	AREA		RUNOFF	RUNOFF	REACH	LENGTH	SLOPE	VELOVITY	2-Yr	100-Yr	INTENSITY		DISCHARGE	
	SURFACE		COEF.	COEF.			(S)		TIME	TIME	Inches/Hour		CFS (Q=CiA)	
	TYPE	Ac.	C2	C100		FEET	%	FT./SEC.	MIN.	MIN.	2-Yr	100-Yr	2-Yr	100-Yr
A	Native grass & scattered trees	8.01	0.32	0.38	A-1	1 100	0.8	0.05	50.2	46.3				
	Total/Average	8.01	0.32	0.38					50.2	46.3	0.66	1.76	1.69	5.36
								MAX. Tc	50.2	46.3		TOTAL Qh:	1.69	5.36
												INCREASE:	3.17	9.45

2.07 2.76

STREET FLOW DEPTH AT THE GUTTER FOR CRITICAL SECTIONS

Flow Through Street, Curb & Gutter
Discharge quantity is calculated by the following formula:
Q=0.56*(Z/n)*S^.5*d^2.67
Where:

Q = Discharge in CFS (Cubic Feet per Second)
Z = Inverse pavement cross slope
n = Manning roughness coefficient
S = Longitudinal slope of the street or gutter
d = Depth of gutter flow in feet

Solving for maximum depth at gutter
Manning Roughness Coefficient= 0.016

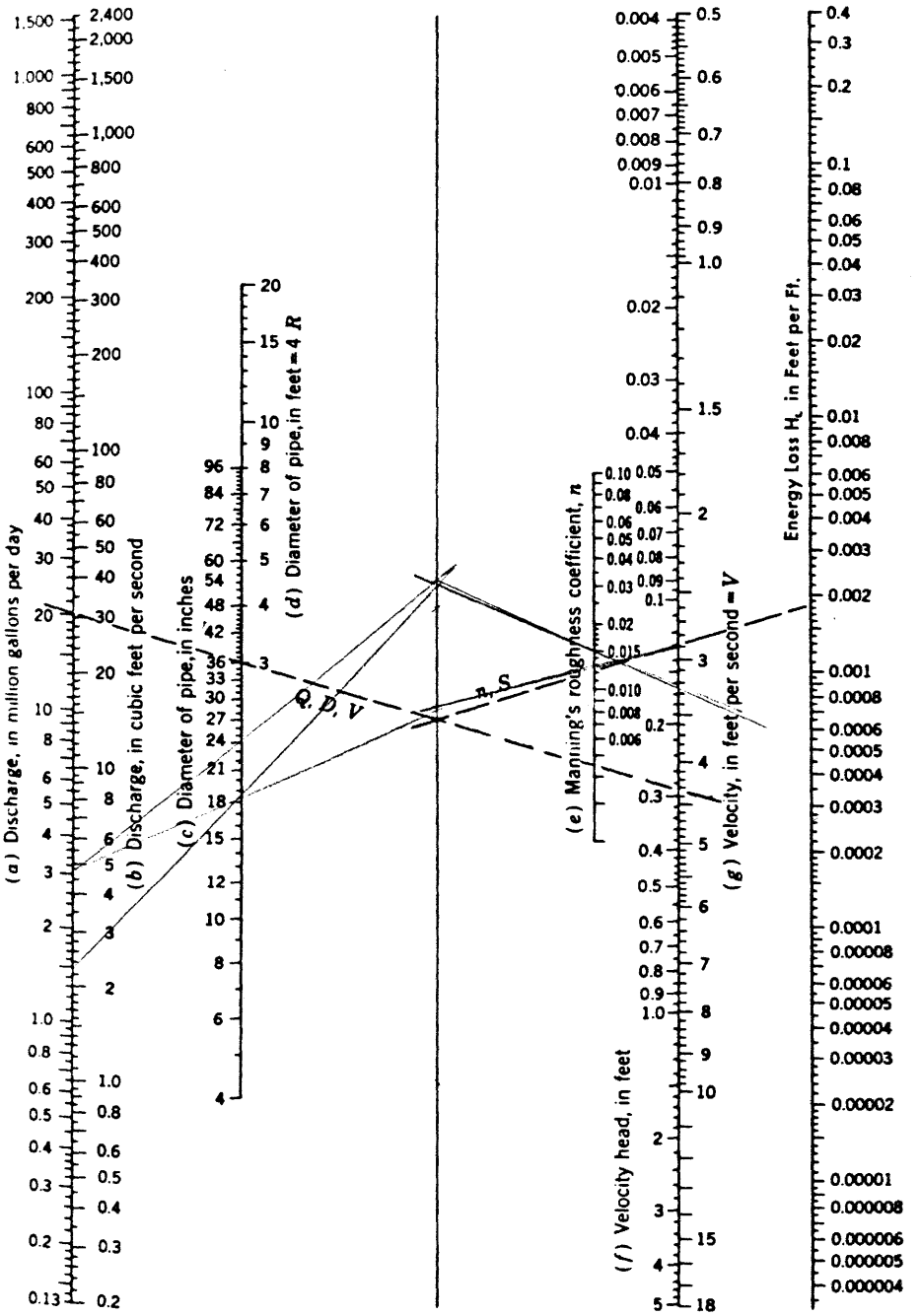
Capacity For Storm Drain Inlets
curb opening length = grate length
Ponding Q= .6 A (2gH)^.5]
H2 = 0.5 Ft. H100 = 1.0 Ft.

BASIN OUTFALL	Side of street	Inverse Pave. x slope 1/ft/ft	Min. Long. Slope S ft/ft	Required 2 Year Capacity Q CFS	2 year Water Depth d Ft.	Required 100 Yr Capacity Q CFS	Water Depth d Ft.	Grate Type NEENAH	Open Area Sq. Ft.	Capacity 2 Yr CFS	Required 2 Yr CFS	Capacity 100 Yr CFS	Required 100 Yr CFS
A	south	66.67	0.0052	0.82	0.14	2.54	0.21			0.00	0.82	0.00	2.54
B	south	66.67	0.0052	1.63	0.18	5.05	0.27			0.00	1.63	0.00	5.05
C	south	66.67	0.0052	2.53	0.21	7.82	0.32	R-3246 C	1.70	5.79	2.53	8.19	7.82
D	north	66.67	0.0052	0.52	0.12	1.56	0.17			0.00	0.00	0.00	1.56
E	north	66.67	0.0052	1.15	0.15	3.40	0.23	R-3246 C	1.70	5.79	2.08	8.19	3.40
F	west	66.67	0.0052	1.18	0.16	3.59	0.24	R-3246 C	1.70	5.79	1.18	8.19	3.59

Capacity For Pipe Storm Drainage

Storm Drain Location	Pipe Diameter Inches	Slope Feet/Feet	Rough. Coeff. n	Capacity Q CFS	Required Q CFS	2 year V fps
G1 to G3	18	0.005	0.012	8.1	7.8	2.6
G2 to G3	12	0.005	0.012	2.7	3.6	2.5
G3 to MH 9	24	0.005	0.012	17.5	14.8	2.5
MH 9 to 8+17	18	0.150	0.013	40.7	14.8	NA
8+ 17 to Outfall	12	0.583	0.013	27.2	14.8	NA

Although the friction slope S_f appears as a second order term in the expression for 'C' the resulting discharge is not sensitive to this term. Table 4.11 shows the difference (%) in discharge computed using the Kutter equation compared with that obtained by Manning. The table gives the relationship between the diameter (D) and the hydraulic radius (R) assuming full flow in a circular pipe. The values in Table 4.11 are also valid for noncircular pipes flowing partially full.



Alignment chart for energy loss in pipes, for Manning's formula.
Note: Use chart for flow computations, $H_L = S$

Figure 4.8 Nomograph for solution of Manning's formula.

MICAELA'S VILLAGE

PROJ 3205

ERIC C. MARQUEZ

28 FEB 1995

GIVEN:

$V_{min} = 2.5$ fps

$Q_2 = 4.86$ fps

$D = 2'$

FIND S_{min}

SOLUTION:

$Q = VA$, $A = \frac{Q}{V} = 1.9$ sf, $\frac{A}{D^2} = \frac{1.9}{2^2} = 0.486$

FROM TABLE GIVEN $\frac{A}{D^2} \Rightarrow \frac{y}{D} = 0.509$

GIVEN $\frac{y}{D} \Rightarrow \frac{R}{D} = 0.275$

$\therefore R = 2(0.275) = 0.550$

$V = \frac{1.49}{n} R^{2/3} S^{1/2}$

$S = \left[\frac{Vn}{1.49 R^{2/3}}\right]^2 = \left[\frac{(2.5)(0.011)}{(1.49)(0.550)^{.667}}\right]^2 = 0.17\%$