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File FPP-1995-156
Date 1/4/99

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, not all entries designated to be scanned, are present in the file. There are also documents specific to certain files, not found on the standard list. For this reason, a checklist has been included. **Remaining items, (not selected for scanning), will be marked present on the checklist. This index can serve as a quick guide for the contents of each file.** **Files denoted with (**) are to be located using the ISYS Query System. Planning Clearance will need to be typed in full, as well as other entries such as Ordinances, Resolutions, Board of Appeals, and etc.**
X	X	***Summary Sheet – Table of Contents**
		Application form
		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
		***Mailing list**
		Public notice cards
		Record of certified mail
		Legal description
		Appraisal of raw land
		Reduction of any maps – final copy
		***Final reports for drainage and soils (geotechnical reports)**
		Other bound or nonbound reports
		Traffic studies
		Individual review comments from agencies
X	X	***Consolidated review comments list**
X	X	***Petitioner's response to comments**
X	X	***Staff Reports**
		***Planning Commission staff report and exhibits**
		***City Council staff report and exhibits**
		***Summary sheet of final conditions**
		***Letters and correspondence dated after the date of final approval (pertaining to change in conditions or expiration date)**

DOCUMENTS SPECIFIC TO THIS DEVELOPMENT FILE:

X	X	Subsurface Soils Exploration	X	X	TCP Credit
X	X	Preliminary Plan	X	X	Niagara Village - #1 – 28 ¼ Road Improvements
X	X	Site Plan	X		Surveyor's Certificate
X	X	Grading & Drainage Plan	X	X	Development Improvements Agreement - **
X	X	Street Plan	X	X	Release of Improvements Agreement - **
X	X	Final Plan Narrative	X	X	ORDINANCE NO. 2864 - **
X	X	Location Map			
X	X	Planning Commission Minutes - ** - 12/3/96			
X		Letter from Jody Kliska to Irving Nacht – 6/20/96			
X	X	Letter from Monty Stroup to City of Grand Junction – 1/26/96			
X	X	Letter from Sidney Spivak to Michael Drollinger – 3/12/96			
X		Letter from Richard Livingston of Golden, Mumby, Summers & Livingston Attorneys at Law containing Bylaws of Niagara Village - 9/25/95			
X		Letter from Richard Livingston to Michael Drollinger re: Development Improvement Agreement			
X		Declaration of Covenants, Conditions and Restrictions of Niagara Village Subdivision			
X		Site Development Guidelines for Niagara Village			
X		Security Agreement			
X		Articles of Incorporation			

SUBMITTAL CHECKLIST

MAJOR SUBDIVISION: FINAL

Location: 28 1/4 ROAD S of North Ave Project Name: NIAGARA VILLAGE FILING #1

Date Received 9-1-95

Receipt # 2849

File # FPP-95-156

DESCRIPTION	SSID REFERENCE	● City Community Development	● City Dev. Eng.	● City Utility Eng.	● City Property Agent	● City Parks/Recreation	● City Fire Department	● City Attorney	● City G.J.P.C. (8 sets)	O City Downtown Dev. Auth.	● City Police	O County Planning	O County Building Department	● County Surveyor	O Walker Field	● School Dist. #51	● Irrigation District - Fruitvale	● Drainage District - GVDD	● Water District - UTE	● Sewer District	● U.S. West	● Public Service	O GVRP	O CDOT	O Corps of Engineers	O Colorado Geologic Survey	O U.S. Postal Service	X Persigo WWTF	● TCI Cable	● Soil Conservation Service		TOTAL REQ'D.
● Application Fee see Fee List	VII-1	1																														
● Submittal Checklist*	VII-3	1																														
● Review Agency Cover Sheet*	VII-3	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
● Application Form*	VII-1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
● Reduction of Assessor's Map	VII-1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
● Evidence of Title	VII-2	1			1			1																								
O Appraisal of Raw Land ?	VII-1	1			1	1																										
● Names and Addresses*	VII-2	1																														
● Legal Description*	VII-2	1			1																											
O Deeds	VII-1	1			1			1																								
O Easements	VII-2	1	1	1	1			1													1	1	1						1	1		
O Avigation Easement	VII-1	1			1			1							1																	
O ROW	VII-2	1	1	1	1			1													1	1	1						1	1		
● Covenants, Conditions & Restrictions	VII-1	1	1					1																								
O Common Space Agreements	VII-1	1	1					1																								
● County Treasurer's Tax Cert.	VII-1	1																														
● Improvements Agreement/Guarantee*	VII-2	1	1	1				1																								
O CDOT Access Permit	VII-3	1	1																													
O 404 Permit	VII-3	1	1																													
O Floodplain Permit*	VII-4	1	1																													
● General Project Report	X-7	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1		
● Composite Plan	IX-10	1	2	1	1																											
● 11"x17" Reduction Composite Plan	IX-10	1				1	1	1	8	1	1	1	1				1	1	1	1	1	1	1	1	1	1		1	1	1		
● Final Plat	IX-15	1	2	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
O 11"X17" Reduction of Final Plat	IX-15	1							8	1	1	1			1	1	1	1	1	1	1	1	1				1		1			
● Cover Sheet	IX-11	1	2																													
● Grading & Stormwater Mgmt Plan	IX-17	1	2															1							1	1			1	1		
● Storm Drainage Plan and Profile	IX-30	1	2															1			1	1	1						1	1		
● Water and Sewer Plan and Profile	IX-34	1	2	1			1												1	1	1	1	1					1	1			
● Roadway Plan and Profile	IX-28	1	2															1														
O Road Cross-sections	IX-27	1	2																													
O Detail Sheet	IX-12	1	2																													
● Landscape Plan	IX-20	2	1	1					8																							
● Geotechnical Report	X-8	1	1																							1						
O Phase I & II Environmental Report	X-10,11	1	1																													
● Final Drainage Report	X-5,6	1	2															1												1		
O Stormwater Management Plan	X-14	1	2															1							1							
O Sewer System Design Report	X-13	1	2	1																1												
O Water System Design Report	X-16	1	2	1															1													
O Traffic Impact Study	X-15	1	2																					1								
O Site Plan	IX-29	1	2	1	1		1		8																							

NOTES: * An asterisk in the item description column indicates that a form is supplied by the City.

DEVELOPMENT APPLICATION

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

Receipt 2849
Date
Rec'd By
File No. FPP-95-156

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
■ Subdivision Plat/Plan	■ Minor ☐ Major ■ Resub	5.0 ac.	28 1/4 Road	PR	Residental
☐ Rezone				From: To:	
☐ Planned Development	☐ ODP ☐ Prelim ☐ Final				
☐ Conditional Use					
☐ Zone of Annex					
☐ Variance					
☐ Special Use					
☐ Vacation					☐ Right-of Way ☐ Easement
☐ Revocable Permit					

■ PROPERTY OWNER	☐ DEVELOPER	■ REPRESENTATIVE
WATERLOO NEVADA Ltd.		LANDESIGN, LLC.
Name	Name	Name
PO Box 98, Station L.		200 N. 6th Street
Address	Address	Address
Winnipeg, Manitoba, R3H 0Z4 CANADA		Grand Jct. CO. 81501
City/State/Zip	City/State/Zip	City/State/Zip
204-772-8665		245-4099
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 foregoi 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 revie comments. We recognize that we or our representative(s) must be present at all required hearings. In the event that the petitioner is not represented, the ite will be dropped from the agenda, and an additional fee charged to cover rescheduling expenses before it can again be placed on the agenda.

Thomas A. Logue 8/31/95
Signature of Person Completing Application Date

Signature of Property Owner(s) - attach additional sheets if necessary Date

Waterloo Nevada Ltd.
P.O. Box 98, Station L
Winnipeg, Manitoba
R3H 0Z4 Canada

Landesign LLC
200 N 6th Street
Grand Junction, CO 81501

City of Grand Junction
Community Development Dept.
250 N 5th Street
Grand Junction, CO 81501

Sheldon Mandell
700 S. Orange Avenue
West Covina, CA 91790

RM 18 Corp.
9420 Research Blvd., Ste. 160
Austin, TX 78759

Joanne Duran
P.O. Box 8254
Fort Mohave, AZ 86427

~~National Guard~~
~~482 28 Road~~
~~Grand Junction, CO 81501~~

Dept of Military Affairs
Facilities Management Office
6848 S. Revere Parkway
Englewood CO 80112-6703

Deloris Kirkhart
1514 Ptarmigan Ct.
Grand Junction, CO 81506

Mesa Development Co.
475 17th Street
Denver, CO 80202

James Squirrell
67595 Highway 50
Montrose, CO 81401

Florence Wilcox
2700 G Road, Apt. 8C
Grand Junction, CO 81506

Cahoots Partnership
490 28 1/4 Road
Grand Junction, CO 81501

Stuart Sidney
P.O. Box 1568
Victorville, CA 92393

World Harvest Church
2825 North Avenue
Grand Junction, CO 81501

H. Kendrick
1705 Crestview Drive
Grand Junction, CO 81506

Kathy's Car Wash
2823 North Avenue
Grand Junction, CO 81501

James Hudson
493 28 1/4 Road
Grand Junction, CO 81501

Final Plan Narrative For:

NIAGARA VILLAGE FILING NO. ONE

September 25, 1995

Prepared for;

Waterloo Nevada Limited
P.O. Box 98, Station L
Winnipeg, Manitoba, R3H OZ4 Canada

Prepared by;

LANDesign L.L.C.
200 North 6th. Street
Grand Junction, Colorado 81501
(303) 245-4099

LOCATION - Niagara Village contains approximately 14.5 acres. The subject property is located in the east/central area of Grand Junction, Colorado, west of 28 1/4 Road and one quarter mile south of North Avenue. The property is located in part of the NW 1/4 of Section 18, Township One South, Range One East, of the Ute Meridian.

EXISTING LAND USE - The site is currently vacant of any structures and is in a fallow state. No recent agricultural production has occurred on the property. Topography of the property is considered to be "flat" in nature. The land within Niagara Village slopes towards the southwest at a average rate of one percent. Several years ago the City zoned the property PR-20 for multi-family dwellings, and PB (Planned Business). The property is currently zoned PR-6.

SURROUNDING LAND USE - The Surrounding land use in the vicinity of the subject property is considered to be of high intensity. Predominately non-residential uses, which includes:

NORTH
Kmart
Furr's Cafeteria
Appliance Repair

SOUTH
Vacant Undeveloped Land

EAST
Vacant Undeveloped Land

WEST
National Guard Armory
The Brass Rail Lounge
Convenience Store
Shop Building
Indian Wash

A Location Map at the end of the narrative statement illustrates the location of Niagara Village in relationship to the surrounding land ownership. A reproduction from the City of Grand Junction Zoning Map can be found in the appendix of this narrative.

PROPOSED LAND USE - The proposal calls for the ultimate development of 83 manufactured home sites/individual lots on 14.5 acres. The resulting density is 5.7 dwelling units per acre. The first phase of development is planned for the development of 27 individual lots. The accompanying site plan for Filing No. One depicts the proposed minimum setback requirements for individual lots as building envelopes.

In addition to the individual lot development standards presented herein, strict controls will be instigated to protect the development from undesirable influences. To achieve this, a set of Covenants, Conditions and Restrictions will be recorded to insure ongoing protection to the future residents of Niagara Village and surrounding property owners. Additionally a set of Landscape Guidelines will be provided to each lot owner. These guidelines will include minimum landscape, fencing, and storage requirements.

LAND USE SUMMARY CHART

Use	Area	% of total
Streets	2.5	17
Lots	12.0	83
Total	14.3	100
Single Wide Sites	47	
Double Wide Sites	36	
Total Sites	83	
Density	5.7 du/ac	
Total Off Street Parking	245	

ACCESS - Primary access to Niagara Village will be from 28 1/4 Road which is designated as a collector by the City. Review of the accompanying Location Map reveals that existing access is available to North Avenue, a major east/west arterial. 28 Road, a collector, is located 300 feet west of the subject site. It can be assumed that as the undeveloped area south of Niagara Village develops, additional access points will be available.

Proposed roadway improvements call for the construction of approximately 2160 feet of new public street. The proposal includes an 52-feet R.O.W. single point of access to 28 1/4 Road. The proposal also calls for the construction of roadway improvements for one-half the width of 28 Road plus one additional driving lane along east side 28 1/4 Road for

the entire length of the properties frontage.

According to Trip Generation studies by the Institute of Transportation Engineers, approximately 830 average total daily trips would occur after site development is complete

OPEN SPACE- Approximately 0.17 acres of private open space is to be dedicated with the first phase of development. The open space is to be owned and maintained by the Niagara Village Homeowners Association.

UTILITY SERVICE-

DOMESTIC WATER - All lots within Niagara Village will be served by a domestic water distribution system. An existing 8-inch water main located adjacent to the northeast property corner will be extended into the site to provide water service to lots within the development. The new 8-inch main will be extended westerly across the site to an existing 24-inch main in 28 Road and will provide water for fire protection. The existing water mains are owned and maintained by the City of Grand Junction. Sufficient flows and pressure should exist to provide adequate water supply for fire protection.

SANITARY SEWER - A new 8-inch sanitary sewer collection system will be constructed to serve all lots within Niagara Village. The Fruitvale Sanitation District will own and maintain sewer the new lines and provide service to the development from an existing 10-inch main which is located in 28 Road. It is estimated that peak sewage flows generated by the lots within the development will be 26,145 gallons per day.

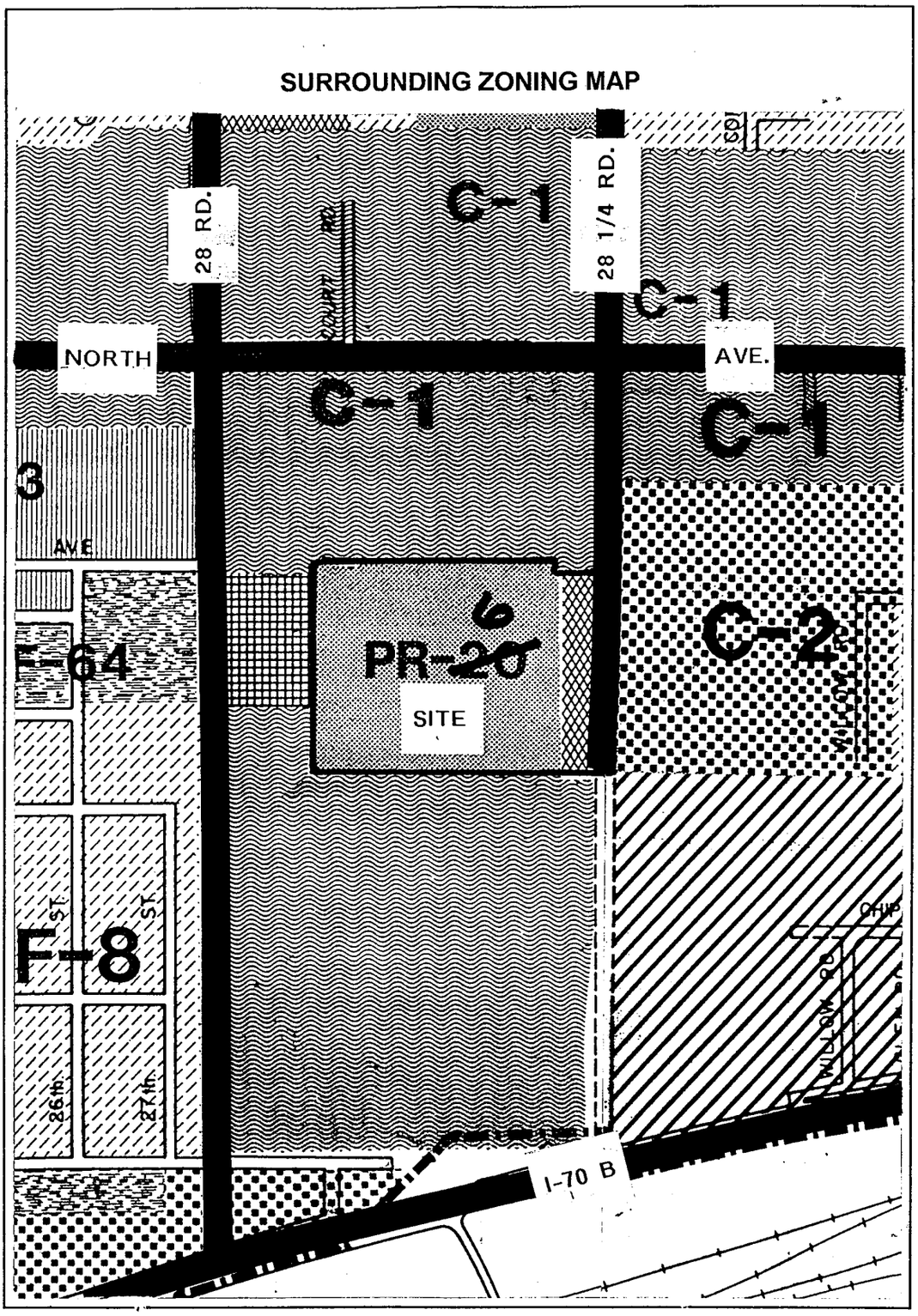
ELECTRIC, GAS PHONE AND CTV - Electric, gas and communication lines will be extended to each site within the development from existing lines located adjacent to the proposed development.

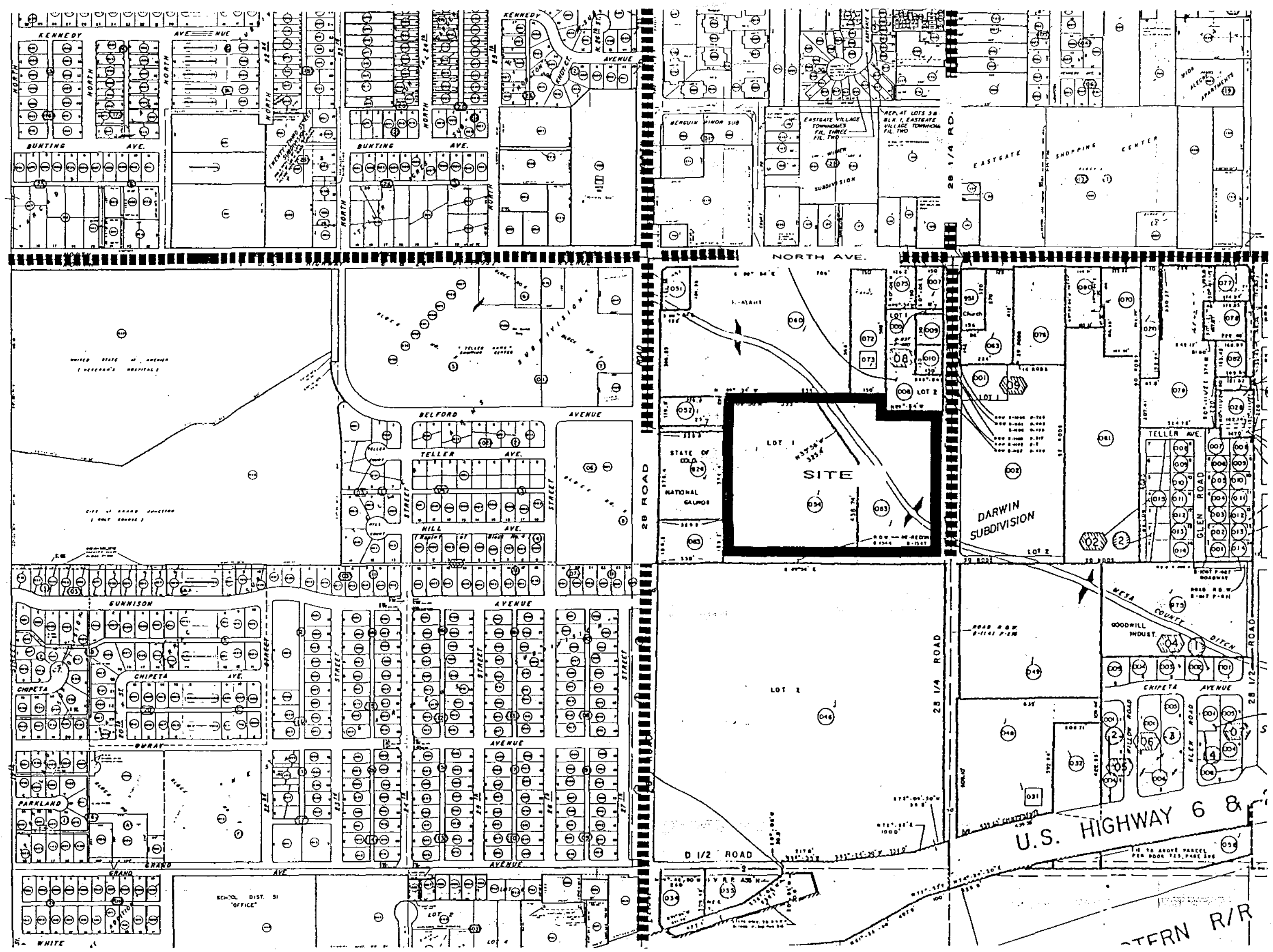
DRAINAGE - A Drainage Report which evaluated the impacts on existing drainage patterns has been submitted to the City's Engineering and Community Development departments under separate cover. Future drainage will be carried on the ground surface to the proposed street system to a point near the southwest corner of the development. A new storm sewer pipeline will be constructed to discharge stormwater directly into the Indian Wash located adjacent to 28 Road.

DEVELOPMENT SCHEDULE - The rate at which development of Niagara Village will occur is dependent upon the City's future growth and housing needs. At this point in time it is anticipated that site development for the first three phases will begin upon the City's acceptance of the Final Plant and Plan. The first phase will consist of 27 lots adjacent to the site's easterly boundary.

APPENDIX

SURROUNDING ZONING MAP





LOCATION MAP

NIAGARA VILLAGE SUBDIVISION

LANDesign
ENGINEERS SURVEYORS PLANNERS

GRAND JUNCTION, COLORADO

PROJECT NO.	DESIGNED	DRAWN	CHECKED	SHEET	OF
DATE: JUNE 1995					1

REVIEW COMMENTS

FILE #FPP-95-156 **TITLE HEADING:** Final Plan/Plat - Niagara Village, Filing #1

LOCATION: E of 28 1/4 Road, S of North Avenue

PETITIONER: Waterloo Nevada Ltd.

PETITIONER'S ADDRESS/TELEPHONE: P.O. Box 98, Station L
Winnipeg, Manitoba
R3H 0Z4 Canada
204-772-8665

PETITIONER'S REPRESENTATIVE: Landesign, LLC

STAFF REPRESENTATIVE: Michael Drollinger

NOTE: THE PETITIONER IS REQUIRED TO SUBMIT FOUR (4) COPIES OF WRITTEN RESPONSE AND REVISED DRAWINGS ADDRESSING ALL REVIEW COMMENTS ON OR BEFORE 5:00 P.M., SEPTEMBER 25, 1995.

CITY POLICE DEPARTMENT **9/7/95**
Dave Stassen **244-3587**

There does not appear to be a driveway for Lot 6, Block 1. This proposal does not pose any problems for the Police Department. In fact, the single entrance and shared driveways follows current Crime Prevention Through Environmental Design concepts.

CITY FIRE DEPARTMENT **9/8/95**
Hank Masterson **244-1414**

The Fire Department has no problems with Filing 1 as proposed.

CITY PARKS & RECREATION DEPARTMENT **9/18/95**
Shawn Cooper **244-3869**

1 Parks and open space fees are required.
2. We need a neighborhood park in this area - possibly south or southeast.

PUBLIC SERVICE COMPANY **9/15/95**
John Salazar **244-2781**

No objections.

CITY DEVELOPMENT ENGINEER **9/15/95**
Jody Kliska **244-1591**

See attached comments.

September 15, 1995

REVIEW COMMENTS FOR: **Niagara Village**

TYPE OF REVIEW: **Final Plat & Plan**

REVIEWED BY: **Jody Kliska**

Plat

No common access easements are shown on the plat for the lots which share access.

No access from the lots to 28 1/4 Road will be allowed. This needs to be noted either on the plat or a separate site plan to be recorded with the plat.

The entire parcel needs to be platted. Future filings may be shown as future filings. The common open space should be dedicated with this filing.

How is the drainage to be handled in this filing? Does there need to be a dedicated drainage easement across the remainder of the property until the project is complete?

What is outlot A? It is not dedicated in the dedication language.

Utility Composite

There is no legend indicating what is to be constructed with this phase. Unless all of the streets are to be constructed now, the remainder of the street should not be shown or should be distinguished from what will be constructed with this phase.

Is there an existing easement across the National Guard property for the proposed utilities? Please provide documentation.

Street Plans

On all street plans, please clarify what is to be constructed with this filing. Only show the details which are necessary for the construction of this filing.

On sheet ST-1 the portion of the street which is apparently not being constructed shows a dimension of 22' of pavement. This is not correct and should be removed.

On sheet ST-2, please do not show anything beyond what is to be constructed with this filing. Please correct the spelling errors of Niagara on the profiles.

On the upper righthand side of the sheet, the profile labeled "Edge of Paveing Taper" has paving spelled incorrectly. It should also be labeled 28 1/4 Road for clarity.

On sheet ST-3, please show on the drawing only what is to be constructed. No soils report was submitted with this application and one is required. The report is needed for verification of the proposed pavement structural sections. If any change is required to these sections, it will also affect the quantities shown in the improvements agreement.

The typical section for 28 1/4 Road calls out grass in the strip between the curb and the detached walk. Will irrigation be provided? It should be noted in the covenants that maintenance of this is the responsibility of the homeowners to maintain this area. Please note section 40-58 of the City Code of Ordinances requires maintenance of the area by the adjoining property owners.

The existing utility pole at the end of the existing 28 1/4 Road improvements is not shown on the plans. Will this pole be relocated?

Drainage

Sheet GD-2 calls out a detail for the riprap outlet in Indian Wash, but no detail is provided.

The pipe for the Goodwill Drain is noted on this sheet as CMP, however, RCP is called out in the Master Drainage Report. CMP is not approved for storm sewer under City Streets, and this will eventually be beneath 28 1/4 Road.

Sheet GD-1 also calls out a detail for the riprap and none is shown.

Please clarify how the drainage from this filing will be conveyed to the storm sewer which is apparently be be constructed with this filing. Is the grading as shown on this drawing to be done now as shown? If not, please provide a drawing which depicts what will be constructed.

Please explain the note on the drawing "Begin subgrade construction."

Improvements Agreement

The improvements agreement detail shows PVC Storm sewer pipe; however, the drainage report and plans call out RCP. Please correct this with the appropriate unit prices.

No costs are shown for the Goodwill Drain work, including the RCP pipe and the two manholes.

No costs are shown for the 7' vertical curb, gutter and sidewalk required on the Niagara Circle entry section.

September 25, 1995

City of Grand Junction
Community Development Department
250 North 5th. Street
Grand Junction, Colorado 81501

Attn: Mr. Michael Drollinger.

Re: **Niagara Village Filing No. One, Response To Review Comments, File #FPP-95-156.**

Dear Mr. Drollinger;

In response to the review comments for this project we present the following:

City Police Department

The driveway access to Lot 6, Block 1 will not interface with any other lot. The lot's geometry and the location of the modular unit upon the lot will define the final driveway location. The comment indicating approval is acknowledged.

City Fire Department

City Parks & Recreation Department

1. Parks and Open space fees are acknowledged and are payable at the time of the recording of the Final Plat.

Public Service Company

The comment indicating approval is acknowledged.

200 NORTH 6TH ST. • GRAND JUNCTION, CO 81501 • FAX (970) 245-3076 • (970) 245-4099

City Development Engineer

Plat:

1. Those lots which have common access have granted "Ingress/Egress Easements" and are shown on the revised "Final Plat"

2. No direct access from the lots to 28 1/4 Road will be allowed. A note has been added to the "Final Plat" to this affect. A final "Site Plan" has been prepared showing minimum setback requirements for this development and is attached for review.

3. The "Final Plat" has been revised to show the entire boundary of the subject site. Future Filings have been designated on the revised Plat. A portion of the proposed "Private Open Space" is to be dedicated with this Filing. The open space area designated on the plat as "Outlot A" has been reviewed and approved by the planning staff. A 1-inch water meter is to be installed within the open space between Lots 4 and 5 of Block Three and will provide irrigation water to the open space.

4. The proposed storm sewer to Indian Wash is to be constructed with the first Filing. The future roadways are dedicated as "Utility, Drainage and Access Easement" and are to be constructed to subgrade elevations. The rough cut roadways will serve as conveyance elements for stormwater to the proposed storm sewer located in the southwest corner of the project. The Department of Military Affairs has been contacted and a request has been made for a 20-foot wide easement across the Colorado National Guard property. The easement will be used for the installation and maintenance of sanitary sewer and storm sewer lines. The request has been verbally approved. A copy of the request and easement exhibit is attached.

5. "Outlot A" is private open space and is so dedicated to the Niagara Village Homeowner's Association on the revised "Final Plat" sheet 1 of 2.

Utility Composite:

1. A phase line and note have been added which identifies the limits of construction for roadway improvements. Sanitary sewer and water lines to be constructed with future phases are shown as dashed. Sanitary sewer and water lines to be constructed with this phase are shown as solid lines.

2. The Department of Military Affairs has been contacted and a request has been made for a 20-foot wide easement across the Colorado National Guard property. The easement will be used for the installation and maintenance of sanitary sewer and storm sewer lines. The request has been verbally approved. A copy of the request and easement exhibit is attached.

Street Plans:

1. A phase line and note have been added which identifies the limits of construction for roadway improvements. The entire site is to be overlot graded. The future roadways are to be constructed to subgrade elevations in order to convey storm water runoff to the proposed storm sewer. Only those details necessary to the construction of phase 1 have been included in the construction drawings.

2. Sheet ST-1, the dimension of 22-feet has been revised to read.

3. Sheet ST-2, curb, gutter and side walk to be constructed with future phases are shown as dashed. The spelling errors have been corrected.

4. Sheet ST-2, the spelling error in the profile for the edge of paving taper has been corrected. The title of the profile has been revised designate 28 1/4 Road.

5. A phase line and note have been added which identifies the limits of construction for roadway improvements. A soils investigation has been performed by Lincoln DeVore Geotechnical Consultants as well as a structural pavement design. A copy of their recommendations are attached. The improvements agreement will be revised to reflect actual bid quantities and prices for the asphalt section as designed by Lincoln DeVore. The agreement shall be submitted prior to the City's approval to begin construction.

6. The typical cross section for 28 1/4 Road has been revised to show "Rock Mulch" between the curb and gutter and the detached sidewalk. This shall minimize maintenance of the strip.

The Covenants define the association's duties and the City's right to remedies for the "performance of maintenance obligations" on page 5, Section 2 paragraph c. The developer acknowledges the associations obligations, by City Code, for maintenance of the strip between the curb and gutter and the detached sidewalk along 28 1/4 Road.

7. The existing utility pole adjacent to the northeast property corner is to remain in place and undisturbed. A conflict between the proposed sidewalk and the existing pole is not anticipated. A not indicating the utility poles location has been added to the construction plans.

Drainage Plans:

1. Sheet GD-2, the "Indian Wash Lateral Storm Sewer Outfall Detail" is shown on Sheet GD-1.

2. All designations for storm sewer pipe have been revised to read "RCP".

3. Sheet GD-1, the note indicating rip-rap has been revised to say "see outfall detail, this sheet". The detail is located at the bottom center of the sheet.

4. The proposed storm sewer to Indian Wash is to be constructed with the first Filing. The future roadways are dedicated as "Utility, Drainage and Access Easement" and are to be constructed to subgrade elevations. The rough cut roadways will serve as conveyance elements for stormwater to the proposed storm sewer located in the southwest corner of the project and ultimately to Indian Wash.

5. See response #4 above.

Improvements Agreement:

All review comments under this item are acknowledged. The improvements agreement shall be revised accordingly and submitted prior to the City's approval to begin construction.

City Utilities Engineer

Ute Water:

1. The developer acknowledges that the City of Grand Junction has been given permission to by Ute Water to provide domestic water to the project site.

Sanitary Sewer:

1. A revised design is hereby submitted for review. The project will be sewered by a 8-inch P.V.C. gravity system connecting to Fruitvale Sanitation District's existing manhole number 123. This can be achieved by raising the original roadway design grades by 2.09-feet resulting in the importation of fill material to build up the site. This design approach has been reviewed by Fruitvale Sanitation District and verbal approval to proceed with design revisions has been granted.

Mesa County School District No. 51

The district's comments are acknowledged.

Community Development Department

1. A revised project narrative has been prepared. Please find a copy attached.

A "Site Plan" has been prepared showing proposed setback requirements and building envelopes as requested.

2. The common open space is to be irrigated with domestic water. A 1-inch water meter and tap are shown on the construction drawings. Each lot owner will irrigate their lot with domestic water.

3. Private open space is dedicated with this phase of development. Due to the high alkalinity content of the site soils, our firm has recommended that the developer accrue the services of a qualified landscape architect to evaluate the best possible alternatives to landscape treatment within the project. A design for the open space is to be submitted prior to the City's approval to begin construction.

4. The developer acknowledges the comment regarding the inner governmental agreement pertaining to the drainage within Indian Wash and formally requests that the City of Grand Junction pursue an amendment as may be required.

5. A "Site Plan" has been prepared showing proposed setback requirements and building envelopes as requested. A statement regarding access from the lots to Gunnison Road and to 28 1/4 Road has been included on the "Final Plat".

6. The "Final Plat" has been revised to show "temporary cul-de-sacs" at the end of the phase 1 improvements. A design and improvements agreement for these two cul-de-sacs will be submitted prior to the City's approval to begin construction.

Grand Junction Drainage District

1. Additional survey field work has been completed to identify downstream drainage conditions. The results have been presented to the District and the design alternative as revised and submitted herein has been reviewed and approved in concept by the District based on meetings between our office and the District. The drain will continue to convey irrigation tailwater and stormwater to conveyance elements located southeast of the project site.

City Property Agent

1. The "Final Plat" has been revised to include the platting of the entire parcel along with the dedication of all required easements outside of the Filing No. One boundary.

2. The old Mesa County Ditch R.O.W. has been abandoned.

3. Interior lot corners will be monumented upon the completion of construction at the positions as shown on the plat.

4. The "Final Plat" has been revised to define "Outlot A" as private open space dedicated to the Niagara Village Homeowners Association.

5. The "Final Plat" has been revised to show a 14-foot multi-purpose easement along the west R.O.W. line of 28 1/4 Road.

6. The "Final Plat" has been revised to show all proposed easements.

Fruitvale Lateral & Waste Ditch

1. The integrity and ability of the Goodwill Drain to convey irrigation tailwater is maintained by the design revisions. See response to Grand Junction Drainage District comments, item #1.

Ute Water

1. The developer acknowledges that the City of Grand Junction has been given permission to by Ute Water to provide domestic water to the project site.

Please contact our office if you have any questions or concerns regarding this response.

Sincerely

Monty D. Stroup
Project Manager

WestWater Engineering
Consulting Engineers

2516 FORESIGHT CIRCLE, #1 GRAND JUNCTION, COLORADO 81505 (970) 241-7076 FAX (970) 241-7097

November 6, 1995

Monty Stroup
LANDesign
200 N. 6th Street, Suite 102
Grand Junction, Colorado 81501

SUBJECT: Niagara Village Filing No. One - Review Comments for Submittal #3

Dear Monty,

We have reviewed your recent submittal for construction of the above referenced project. The submittal was received in three parts including 1) a copy of the signed easement deed and agreement between the Brass Rail and the Niagara Village Homeowners Association submitted by Mr. Livingston on November 2nd, 2) the Fruitvale Sanitation District Sewer Line Extension Application and Agreement, a proposed construction schedule, a revised plat and the majority of the design drawings that were hand delivered on November 2nd, and 3) revised sheet ST-3 showing the barricade detail which was hand delivered November 3rd. Our comments are summarized below and are numbered in the same manner as our second review letter dated November 1.

1a. The Extension Application and the Agreement is incomplete and is being returned for completion. Specific information that is missing is as follows: 1) page 1 - common location of property, description of proposed sanitary sewer extension and estimated total cost, and 2) page 3 - date, owner, address, phone number, representative, subdivision, location, contractor and total extension contract price. In addition, we did not receive the required deposit fee of $300 for review of the sewer line extension, but believe this may be because the flow chart and explanation of engineering review and associated costs may have been missing in your package. Since we are close to approval, the deposit will be waived. A copy of the flow chart is enclosed for your reference through completion of the project. The final review fee will be invoiced once a set of plans that can be approved is received.

1b. It is understood that this comment remains in effect.

1c. It is understood that this comment remains in effect.

2a. A revised easement and agreement between the Homeowners and the District was not received. The sewer that is referred to in Section Two of the easement is to be clarified as a "sanitary" sewer, similar to the reference to "storm" sewer. Also, if the signed easement between the Brass Rail and the Homeowners Association has not been recorded, it too should be modified to identify the sewer as a sanitary sewer in Section Two, per our original comments dated October 10, 1995.

NIAGARA VILLAGE FILING NO. 1
28 1/4 ROAD FROM NIAGARA CIRCLE SOUTH
STREET IMPROVEMENTS 02-Nov-95

ITEM	DESCRIPTION	UNIT	QUAN	UNIT PRICE	TOTAL
1	Remove Clear & Grub	LS	1	$670.00	$670.00
2	Import Pit Run for Street Section To Sub-grade 0-2 Ft Deep Varies w/ Loc.	TONS	1,353	$3.70	$5,006.10
3	Import Fill Material (dirt)	TONS	282	$2.95	$831.90
4	Sub-Grade Preperation	SY	2,316	$0.72	$1,667.52
5	Class 6 ABC Under Curbs & Walkway	TONS	134	$10.60	$1,420.40
6	5" Grading C HBP	TONS	501	$26.45	$13,251.45
7	24-Inch Curb & Gutter	LF	535	$7.62	$4,076.70
8	5-Foot Detached Sidewalk	SF	2,675	$2.05	$5,483.75
9	Gravel Shoulder	LS	1	$700.00	$700.00
10	8" Fillets	SF	420	$3.78	$1,587.60
11	8" Cross Pans	SF	216	$3.47	$749.52
12	Handicap Ramp	SF	489	$2.90	$1,418.10
13	Post Delineators (9 Each)	LS	1	$133.00	$133.00
14	Realign Waste Ditch	LS	1	$1,075.00	$1,075.00
15	Adjust Water Valves	EA	1	$130.00	$130.00
16	Road Barricade	EA	1	$1,350.00	$1,350.00
17	Compliance Testing	LS	1	$670.00	$670.00
	TOTAL STREET IMPROVEMENTS				$40,221.04

2b. It is understood that this comment remains in effect.

2c. The District is willing to waive the requirement that no fences shall be constructed across the easement of the Brass Rail property, however, the language shall allow the District to remove any fence or other obstruction that may be placed in the 20 foot easement in the event the District needs to access the sewer line. Should the District need to remove the fence, it would be reinstalled by the District.

2d. It is understood that this comment remains in effect.

2e. It is understood that this comment remains in effect.

3a. The design modification is accepted.

3b. Removable rails on the barricade on North Niagara Circle are acceptable, however, the note refers to posts being installed at 10' spacing. The detail should be clarified per our telephone conversation on November 2nd, in which you indicated that the center post has been deleted and the space between the two interior posts is 20' to allow a vehicle to drive between the posts when rails are removed.

4a. The correction has been made.

4b. Requirements for construction of the gravel road has been noted.

4c. Requirements for construction of the berm road has been noted.

5a. Correction has been made.

5b. Notes have been added.

5c. The profile on sheet SW-2 has not been clarified to identify which grade line is existing and which is the finished grade. Notes should be added similar to the notes on sheet SW-1.

5d. It is understood that this comment remain in effect.

5e. It is understood that this comment remains in effect.

5f. It is understood that this comment remains in effect.

5g. Clarify the notes on the plan and profile of the 40 foot stub out for the B line sewer at MH-A3. Install a glued end cap and mark the location with a 2x4 post

painted green. The terminology "glue and plug" that is on the drawings is not acceptable. It is understood that the stub out will be subject to all testing required of new sewer lines.

5h. Note 10 of the standard sewer notes is still incorrect. The note is to be corrected to read as follows:

> The Contractor is responsible for all required sewer line testing to be completed in the presence of the District Engineer or their representative. Final testing is to be accomplished only after all other infrastructure has been installed. This includes waterlines, gas lines, electric lines, etc. Testing will be performed after all compaction of street subgrade and prior to street paving. Final lamping will also be accomplished after paving is completed to insure that the line is clean. These tests will be the basis for issuing Initial Acceptance of the sewer line.

5h. The match line has not been added.

5j. The notes have been added.

5k. The approval block has been corrected.

5l. The vertical scale has been added.

5m. It is understood that this comment remains in effect.

5n. No further comment.

5o. The description of MH-A1 has not been corrected to include the invert elevation for the existing 10" inlet pipe. MH-A1 has one 10" inlet from the north, one 8" inlet from the west and one 10" outlet to the south.

5p. Note 4 of the general notes is to refer to existing sanitary sewer lines and manholes. Reference only to manholes does not apply to the project because the design has the new pipe connecting to the existing sewer line, and not to an existing manhole.

5q. Corrections have been made.

5r. Corrections have been made.

5s. It is understood that this comment remains in effect.

Once the above comments are addressed, please submit at least 5 sets of stamped drawings for approval along with the other documents requested herein. We will retain 2 copies, one for our files and one for the District, and return the remaining sets to your office. I will be out of the office from Wednesday the 8th through the following Tuesday. If you have any questions or need assistance during this period, please contact Steve LaBonde.

Respectfully,

C. Kellie Knowles, P.E.

cc: Art Crawford, District Manager
Michael Drollinger, City of Grand Junction
Sidney Spivak, President

STAFF REVIEW

FILE: #FPP- 95-156
DATE: September 19, 1995
STAFF: Michael Drollinger
REQUEST: Final Plan & Plat - Niagara Village Filing #1
LOCATION: E of 28 1/4 Road; S. of North Avenue
ZONING: PR-5.8

STAFF COMMENTS:

1. Project narrative is incomplete. Please provide complete narrative using the SSID manual checklist as guidance. Please include detail of proposed setbacks in your narrative. As discussed with your office, we require that you prepare a "Site Plan" sheet to be recorded with the plat which contains setback and proposed building envelope information

2. Is irrigation proposed for the project? Please detail in project narrative.

3. The construction and dedication of the common open space will be required in the first filing. Please provide us with plans for the open space area.

4. No final approval by the City of plans for construction of this project will be issued prior to the drainage agreement for Indian Wash is amended as required.

5. "Site Plan" drawing discussed above should also include a statement that no access will be permitted from the lots onto the Gunnison Road ROW (along the southern boundary of the property).

6. Temporary cul-de-sacs on Niagara Circle South and North should be designed (include plans); designated on the plat and included in a separate improvements guarantee but NOT constructed with Filing #1.

Please contact the Community Development Department if you have any questions or require further explanation of any item.

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STAFF REVIEW

FILE: #FPP-95-156

DATE: September 25, 1995

STAFF: Michael T. Drollinger

REQUEST: Final Plan & Plat - Niagara Village Filing #1

LOCATION: W side of 28 1/4 Road; S of North Avenue

APPLICANT: Waterloo Nevada Ltd.
P.O. Box 98, Station L
Winnipeg, Manitoba, Canada

EXECUTIVE SUMMARY:

The petitioner is requesting final plan and plat approval for 28 single family lots on approximately five (5) acres zoned PR-5.8 (Planned Residential with a density not to exceed 5.8 units per acre). The development proposal is in conformance with the Preliminary Plan approval. Access to the site is proposed from 28 1/4 Road. Half street road improvements with a 22 foot travel lane will be constructed along the entire property frontage on 28 1/4 Road.

EXISTING LAND USE: Vacant

PROPOSED LAND USE: Residential - Single Family (Manufactured Housing)

SURROUNDING LAND USE:

NORTH: Commercial (Kmart; Furr's Cafeteria)
SOUTH: Vacant (Commercial Zoning)
EAST: Vacant (Commercial Zoning)
WEST: Commercial; Public (National Guard Armory, The Brass Rail, Convenience store, etc.)

EXISTING ZONING: PR-5.8 (zoning effective date: October 8, 1995)

SURROUNDING ZONING: (see also attached map)

NORTH: C-1
SOUTH: C-1
EAST: C-2

WEST: PZ

RELATIONSHIP TO COMPREHENSIVE PLAN:

No current comprehensive plan exists for the area. Three plan alternatives have been identified as part of the development of the Grand Junction Growth Plan. The Growth Plan Steering Committee has made a preliminary recommendation in favor of the Concentrated Growth Alternative. The current plan alternatives for the site are:

Current Practices Alternative: High density residential - 12+ DU /acre
Concentrated Growth Alternative: High density residential - 12+ DU/ acre
Urban Core/Outlying Growth Centers Alternative: RMH (Residential Medium/High Density) - 8 -12 DU/acre

STAFF ANALYSIS:

Petitioner's request is for final plan and plat approval for 28 single family lots on approximately five (5) acres. The final plan is consistent with the preliminary plan approval. The development proposal includes construction of half street improvements along the entire 28 1/4 Road frontage including 22 feet of pavement to provide adequate vehicular access to the site. Utility services to the site are detailed in the petitioner's project report.

The developer will dedicate and construct with this filing approximately 0.17 acres of private open space which will be owned and maintained by the Niagara Village Homeowners Association. Proposed setback requirements and driveway configurations for the project are illustrated on the attached "Site Plan" map and are acceptable to staff. Also attached for reference are the proposed plat, street plan, and grading and drainage plan. The preliminary plan and an aerial map are also attached for reference and orientation.

Conditions of Approval

The petitioner has satisfactorily addressed all major outstanding issues with two exceptions. To date, Fruitvale Sanitation has not has an opportunity to review the revised sewer plans, however, they will review and comment on them prior to hearing. Also, the City Development Engineer has not had an opportunity to review the petitioner's revised plans as of the date of this staff report. An attempt will be made to notify and resolve any outstanding engineering issues prior to the hearing date.

Staff recommends denial of the final plat and plan request unless the above issues are resolved.

Should Planning Commission choose to approve the subject application, staff recommends that at a minimum the following conditions be part of the approval:

1. The petitioner must provide an executed easement agreement with the Colorado National Guard (Department of Military Affairs) prior to approval of final plans.

2. The maintenance agreement for Indian Wash must be amended to accept the stormwater discharge for this project prior to approval of final plans, otherwise, the petitioner will be required to retain stormwater on-site unless an alternative design acceptable to the City can be developed.

STAFF RECOMMENDATION:

Staff recommends denial of the final plan and plat subject to resolution of the issues identified in this staff report.

RECOMMENDED PLANNING COMMISSION MOTION:

Mr. Chairman, on item RZP-95-156, a request for final plan and plat approval, I move that approve this application subject to conditions #1 & #2 in the staff report dated September 25, 1995. (STAFF RECOMMENDS DENIAL)

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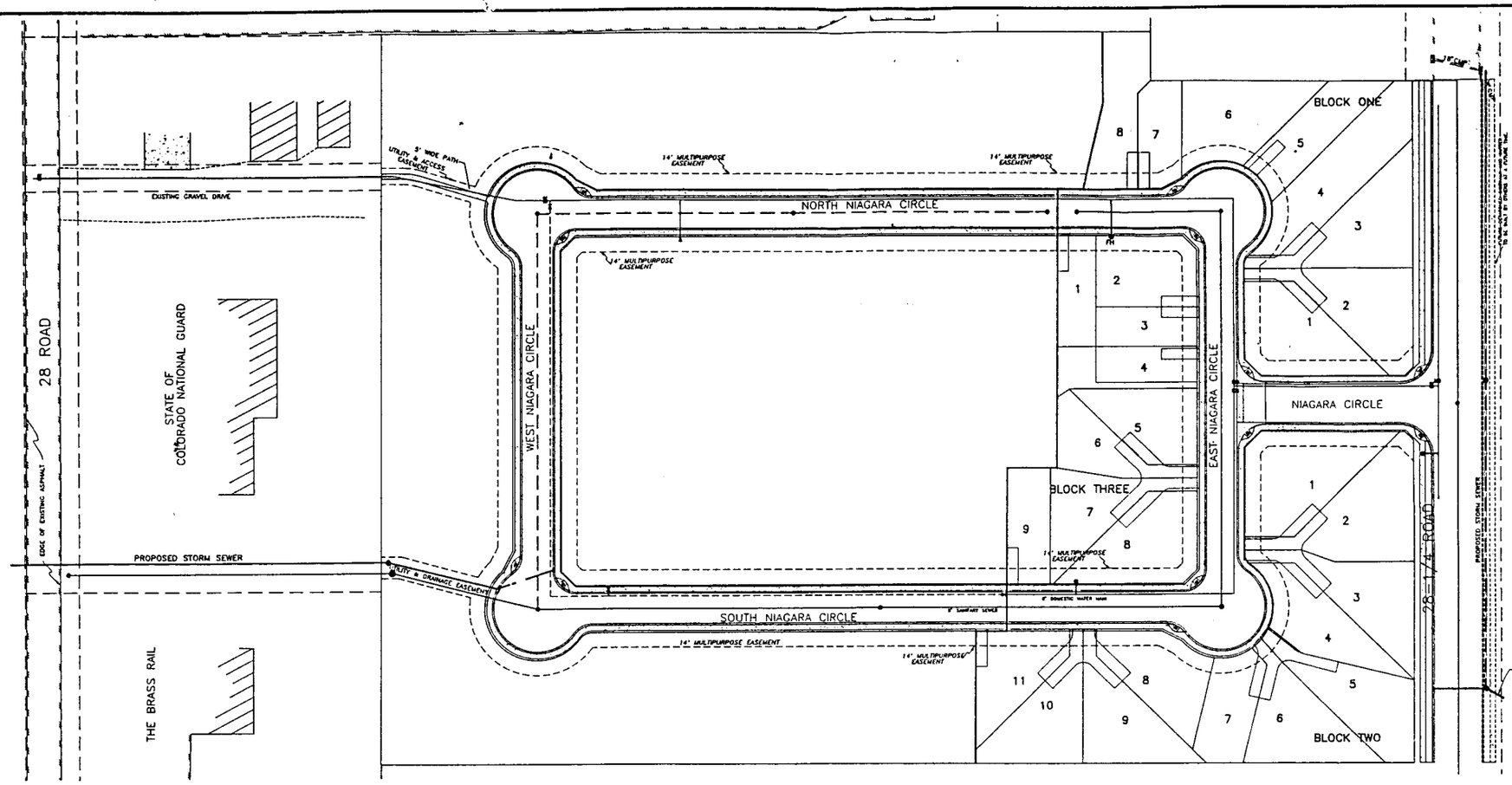
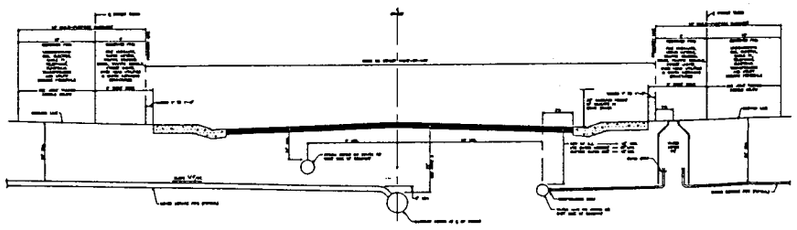




TYPICAL STREET SECTION

SCALE: 1" = 50'

CITY OF GRAND JUNCTION

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____

ACCEPTED AS CONSTRUCTED

BY: _____ DATE: _____

REVISIONS	
No.	DATE

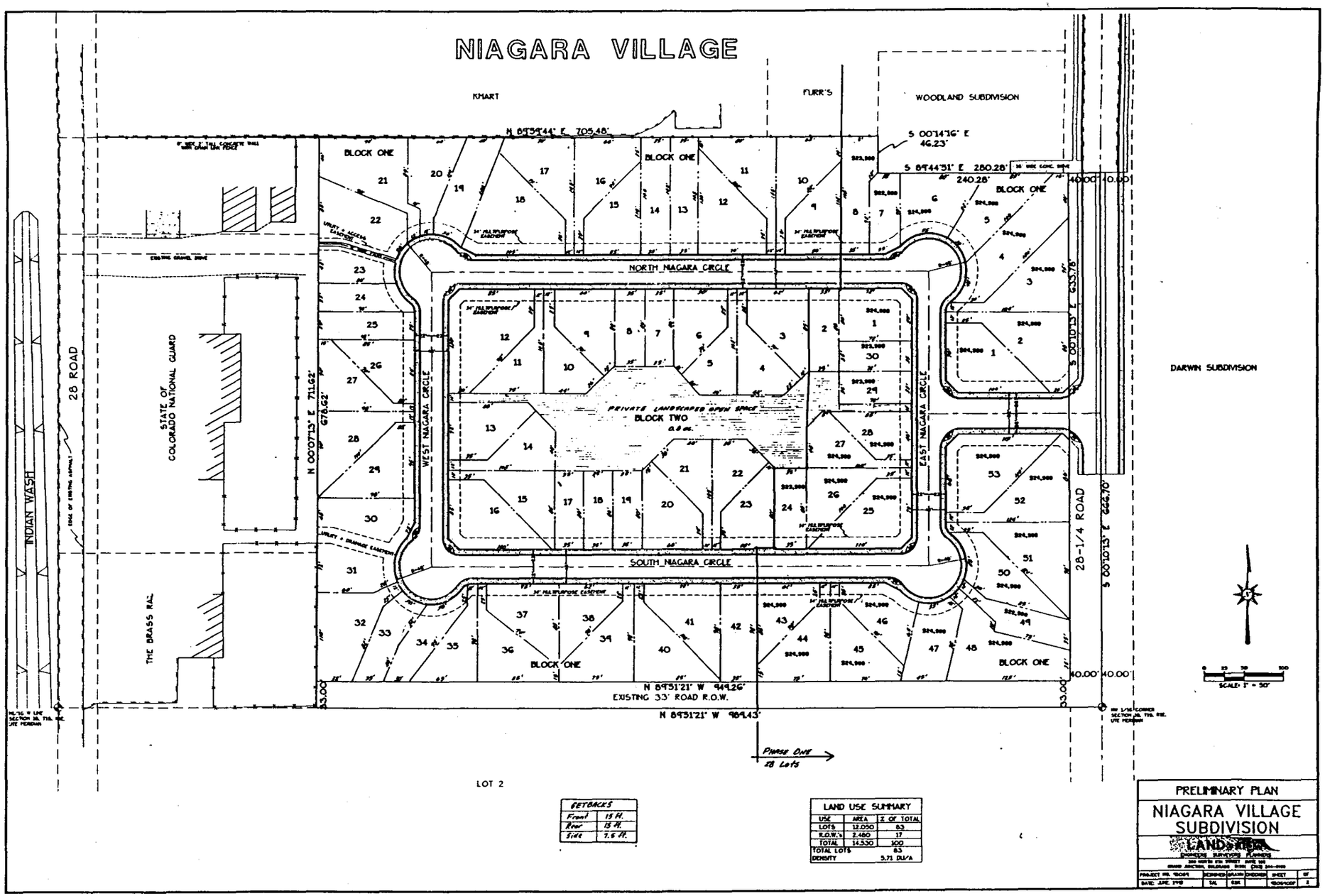
PHILIP M. HART
REGISTERED PROFESSIONAL ENGINEER
P.E. NO. 13348

UTILITY COMPOSITE

NIAGARA VILLAGE SUBDIVISION

LAND esign
ENGINEERS SURVEYORS PLANNERS
200 NORTH 6TH STREET SUITE 102
GRAND JUNCTION, COLORADO 81501 (303) 244-8180

PROJECT NO. 85069	DESIGNED	DRAWN	CHECKED	SHEET	OF
DATE: SEPT 1, 1985	BR	JOS/BR		UC-1	1



SETBACKS	
Front	15 ft.
Rear	15 ft.
Side	7.5 ft.

LAND USE SUMMARY		
USE	AREA	% OF TOTAL
LOTS	12.050	83
R.O.W.'s	2.480	17
TOTAL	14.530	100
TOTAL LOTS		83
DENSITY		5.71 DU/A

PRELIMINARY PLAN

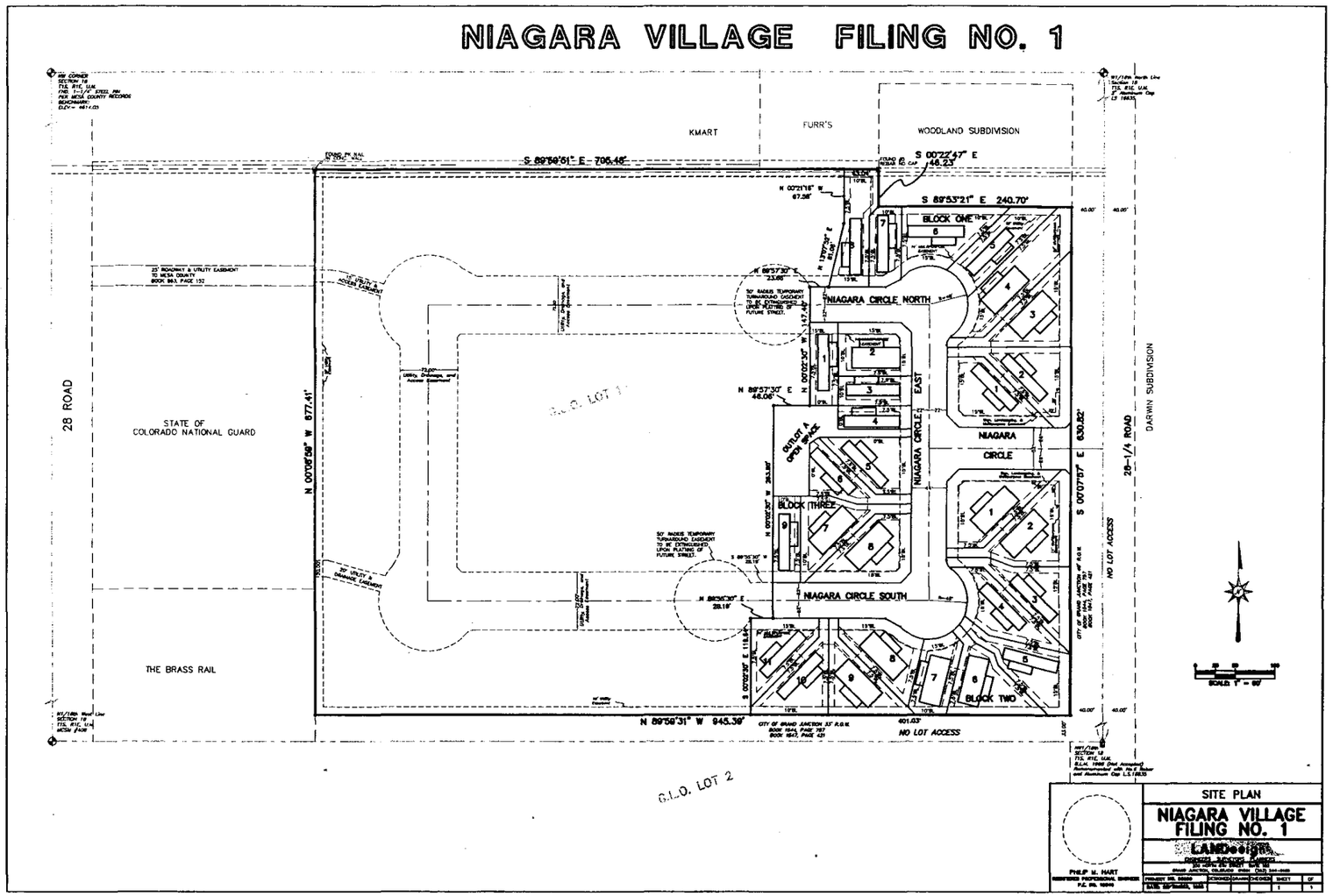
NIAGARA VILLAGE SUBDIVISION

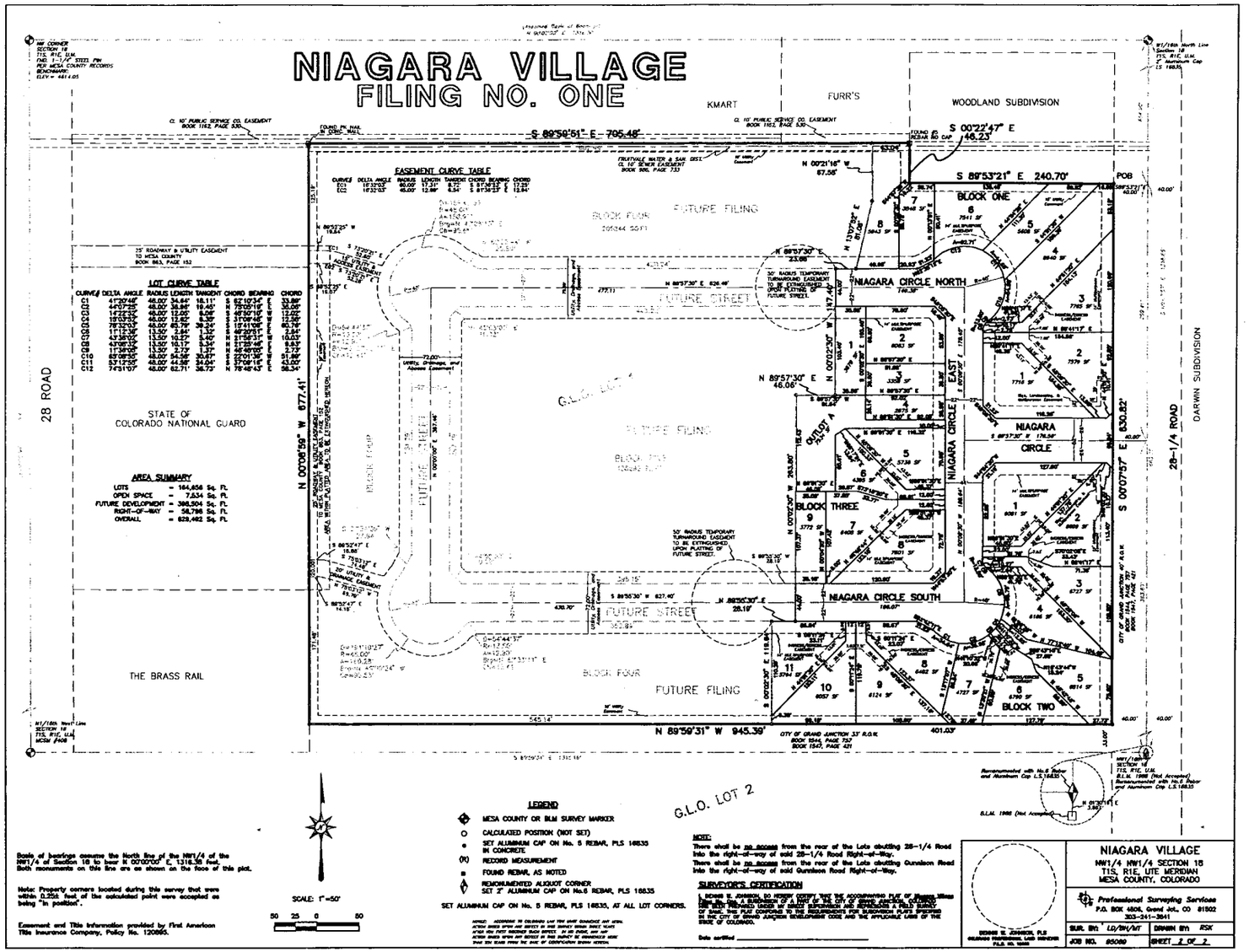
LAND TECH

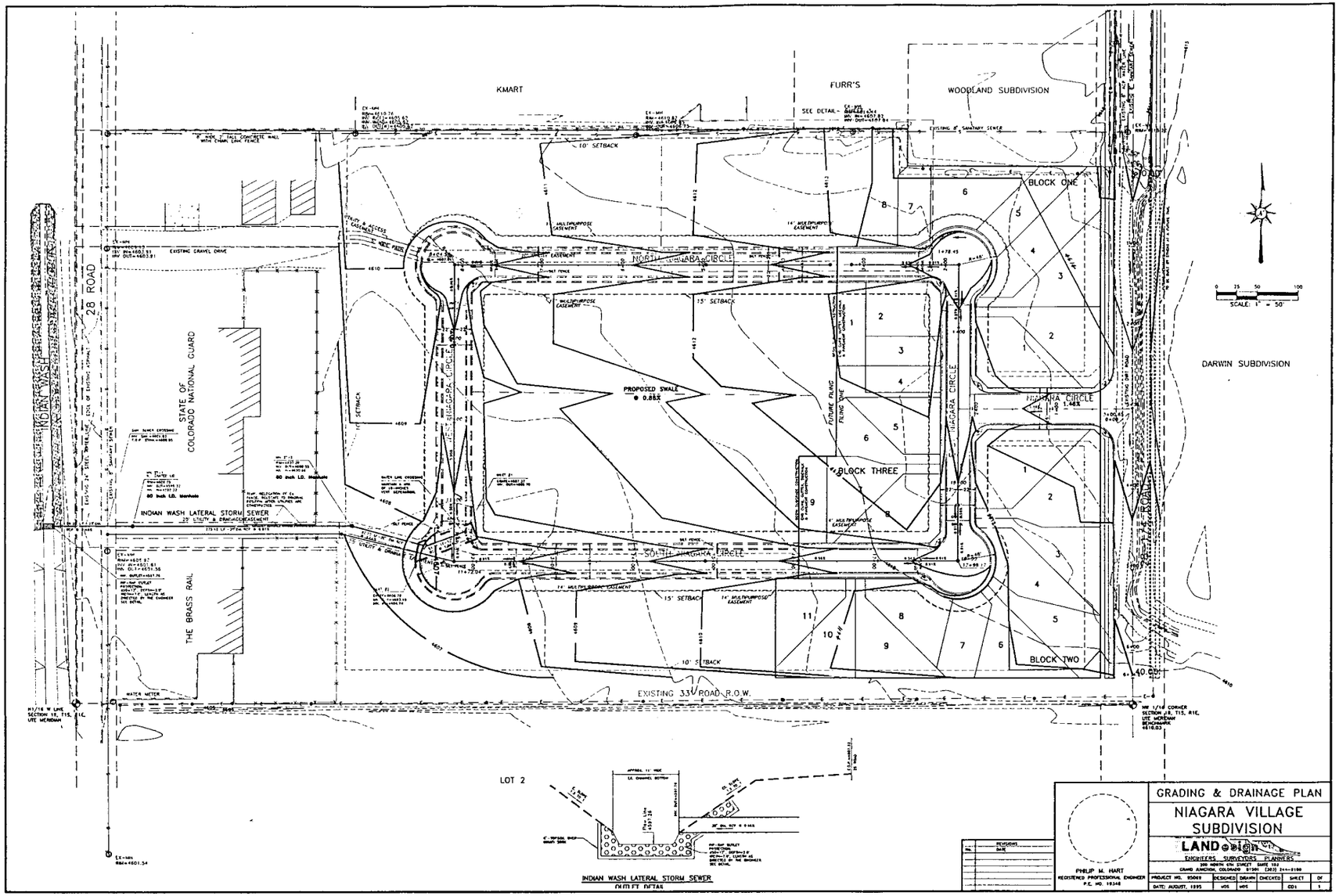
ENGINEERS SURVEYORS PLANNERS

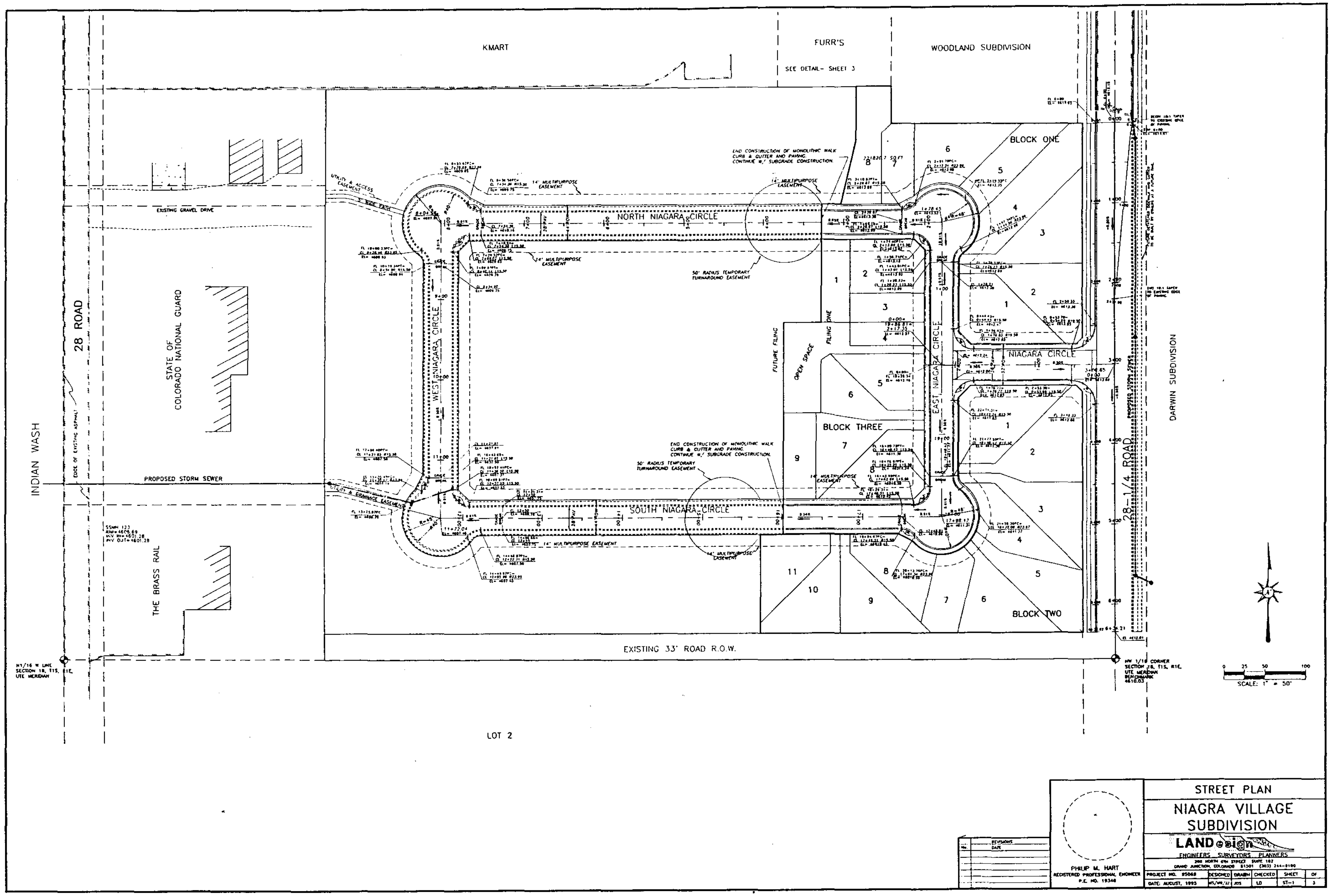
PROJECT NO. 90491	DESIGNED	DRAWN	CHECKED	SHEET	OF
DATE: JUNE 1990	SAL	RSK		90491DP	1

NIAGARA VILLAGE FILING NO. 1




NIAGARA VILLAGE
FILING NO. ONE
KMART
FURR'S
WOODLAND SUBDIVISION
S 89°56'51" E 705.48'
S 00°22'47" E 46.23'
S 89°53'21" E 240.70'
POB
N 00°21'16" W 67.56'
BLOCK ONE
BLOCK TWO
BLOCK THREE
BLOCK FOUR
FUTURE FILING
FUTURE STREET
NIAGARA CIRCLE NORTH
NIAGARA CIRCLE EAST
NIAGARA CIRCLE
NIAGARA CIRCLE SOUTH
N 89°57'30" E 46.08'
N 89°57'30" E 626.49'
28 ROAD
28-1/4 ROAD
DARWIN SUBDIVISION
N 00°08'59" W 877.41'
S 00°07'57" E 830.82'
STATE OF COLORADO NATIONAL GUARD
THE BRASS RAIL
N 89°56'31" W 945.39'
G.L.O. LOT 2
EASEMENT CURVE TABLE
LOT CURVE TABLE
AREA SUMMARY
LOTS = 164,456 Sq. Ft.
OPEN SPACE = 7,534 Sq. Ft.
FUTURE DEVELOPMENT = 398,504 Sq. Ft.
RIGHT-OF-WAY = 58,796 Sq. Ft.
OVERALL = 629,482 Sq. Ft.
LEGEND
MESA COUNTY OR BLM SURVEY MARKER
CALCULATED POSITION (NOT SET)
SET ALUMINUM CAP ON No. 5 REBAR, PLS 16635 IN CONCRETE
(R) RECORD MEASUREMENT
FOUND REBAR, AS NOTED
REMONUMENTED ALIQUOT CORNER
SET 3" ALUMINUM CAP ON No.5 REBAR, PLS 16635
SET ALUMINUM CAP ON No. 5 REBAR, PLS 16635, AT ALL LOT CORNERS.
NOTE:
There shall be no access from the rear of the Lots abutting 28-1/4 Road into the right-of-way of said 28-1/4 Road Right-of-Way.
There shall be no access from the rear of the Lots abutting Gunnison Road into the right-of-way of said Gunnison Road Right-of-Way.
SURVEYOR'S CERTIFICATION
Basis of bearings assume the North line of the NW1/4 of the NW1/4 of Section 18 to bear N 00°07'00" E, 1,316.36 feet. Both monuments on this line are as shown on the face of this plat.
Note: Property corners located during this survey that were within 0.25± feet of the calculated point were accepted as being "in position".
Easement and Title Information provided by First American Title Insurance Company, Policy No. 120895.
SCALE: 1"=50'
50 25 0 50
NIAGARA VILLAGE
NW1/4 NW1/4 SECTION 18
T1S, R1E, UTE MERIDIAN
MESA COUNTY, COLORADO
Professional Surveying Services
P.O. BOX 4808, Grand Jct., CO 81502
303-241-3841
SUR. BY: LD/BW/MT DRAWN BY: RSK
JOB NO. 85089 SHEET 2 OF 2


KMART
FURR'S
WOODLAND SUBDIVISION
28 ROAD
INDIAN WASH
STATE OF COLORADO NATIONAL GUARD
THE BRASS RAIL
INDIAN WASH LATERAL STORM SEWER
NORTH NIAGARA CIRCLE
SOUTH NIAGARA CIRCLE
NIAGARA CIRCLE
PROPOSED SWALE
BLOCK ONE
BLOCK THREE
BLOCK TWO
DARWIN SUBDIVISION
EXISTING 33' ROAD R.O.W.
SCALE: 1" = 50'
LOT 2
INDIAN WASH LATERAL STORM SEWER
PHILIP M. HART
REGISTERED PROFESSIONAL ENGINEER
P.E. NO. 19348
GRADING & DRAINAGE PLAN
NIAGARA VILLAGE SUBDIVISION
LANDesign
ENGINEERS SURVEYORS PLANNERS
PROJECT NO. 95069
DESIGNED WDS
DRAWN WDS
CHECKED
SHEET 1
DATE: AUGUST, 1995


KMART
FURR'S
SEE DETAIL- SHEET 3
WOODLAND SUBDIVISION
BLOCK ONE
BLOCK TWO
BLOCK THREE
NORTH NIAGARA CIRCLE
SOUTH NIAGARA CIRCLE
WEST NIAGARA CIRCLE
EAST NIAGARA CIRCLE
NIAGARA CIRCLE
OPEN SPACE
FUTURE FILING
FILING ONE
28 ROAD
28-1/4 ROAD
INDIAN WASH
STATE OF COLORADO NATIONAL GUARD
THE BRASS RAIL
DARWIN SUBDIVISION
EXISTING GRAVEL DRIVE
PROPOSED STORM SEWER
EXISTING 33' ROAD R.O.W.
LOT 2
14' MULTIPURPOSE EASEMENT
50' RADIUS TEMPORARY TURNAROUND EASEMENT
END CONSTRUCTION OF MONOLITHIC WALK CURB & GUTTER AND PAVING. CONTINUE W/ SUBGRADE CONSTRUCTION.
SCALE: 1" = 50'
STREET PLAN
NIAGRA VILLAGE SUBDIVISION
LANDesign
ENGINEERS SURVEYORS PLANNERS
PHILIP M. HART
REGISTERED PROFESSIONAL ENGINEER
P.E. NO. 19348
PROJECT NO. 95068
DATE: AUGUST, 1995
SHEET ST-1 OF 3

SUBSURFACE SOILS EXPLORATION

NIAGARA VILLAGE SUBDIVISION

GRAND JUNCTION, COLORADO

Prepared For:

SIDNEY J. SPIVAK Q.C.
Box 98 Sta. L
Winnipeg, Manitoba, Canada R3HoZ4

Prepared By:

LINCOLN-DeVORE, INC.
1441 Motor Street
Grand Junction, CO 81505

September 28, 1995

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

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

September 28, 1995

SIDNEY J. SPIVAK, Q.C.
Box 98 Sta. L
Winnipeg, Manitoba, Canada R3HoZ4

Re: SUBSURFACE SOILS EXPLORATION

NIAGARA VILLAGE SUBDIVISION

Grand Junction, Colorado

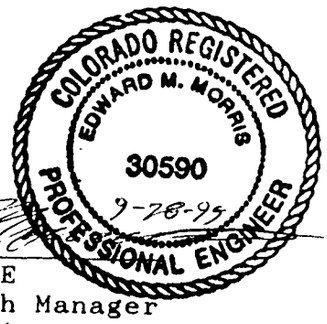
Dear Sir:

Transmitted herein are the results of a Subsurface Soils Exploration for the proposed Niagara Village Subdivision.

If you have any questions after reviewing this report, please feel free to contact this office at any time. This opportunity to provide Geotechnical Engineering services is sincerely appreciated.

Respectfully submitted,

LINCOLN-DeVORE, INC.



By: _____
Edward M. Morris, PE
Western Slope Branch Manager
Grand Junction, Office

LDTL Job No. 84110-J

EMM/bh

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INTRODUCTION

PROJECT DESCRIPTION

This report presents the results of our geotechnical evaluation performed to determine the general subsurface conditions of the site applicable to construction of a residential subdivision. A vicinity map is included in the Appendix of this report.

To assist in our exploration, we were provided with a site plan and drainage basin map prepared by LANDesign of Grand Junction, Colorado. The Boring Location Plan attached to this report is based on that plan provided to us.

We understand that the proposed structures will consist of single story, wood framed stick built and manufactured residential structures with no basements and either concrete floor slabs on grade or crawl-space type construction. Lincoln DeVore has not seen a full set of building plans, but structures of this type typically develop wall loads on the order of 300-900 l ' and column loads on the order of 4-12 kips.

The characteristics of the subsurface materials encountered were evaluated with regard to the type of construction described above. Recommendations are included herein to match the described construction to the soil characteristics found. The information contained herein may or may not be valid for other purposes. If the proposed site use is changed or types of construction proposed, other than noted herein, Lincoln DeVore should be contacted to determine if the information in this report can be used for the new construction without further

field evaluations.

PROJECT SCOPE

The purpose of our exploration was to evaluate the surface and subsurface soil and geologic conditions of the site and, based on the conditions encountered, to provide recommendations pertaining to the geotechnical aspects of the site development as previously described. The conclusions and recommendations included herein are based on an analysis of the data obtained from our field explorations, laboratory testing program, and on our experience with similar soil and geologic conditions in the area.

Specifically, the intent of this study is to:

1. Explore the subsurface conditions to the depth expected to be influenced by the proposed construction.
2. Evaluate by laboratory and field tests the general engineering properties of the various strata which could influence the development.
3. Define the general geology of the site including likely geologic hazards which could have an effect on site development.
4. Develop geotechnical criteria for site grading and earthwork.
5. Identify potential construction difficulties and provide recommendations concerning these problems.
6. Recommend an appropriate foundation system for the anticipated structure and develop criteria for foundation design.

FIELD EXPLORATION AND LABORATORY TESTING

A field evaluation was performed on 9-22-95, and consisted of a site reconnaissance by our geotechnical personnel and the drilling of 3 shallow exploration borings. These shallow exploration borings were drilled within the proposed building areas near the locations indicated on the Boring Location Plan. The exploration borings were located to obtain a reasonably good profile of the subsurface soil conditions. All exploration borings were drilled using a CME 45-B, truck mounted drill rig with continuous flight auger to depths of approximately 15-32 feet. Samples were taken with a standard split spoon sampler, lined California sampler, think walled Shelby tubes, and by bulk methods. Logs describing the subsurface conditions are presented in the attached figures.

The boring logs and related information show subsurface conditions at the date and location of this exploration. Soil conditions may differ at locations other than those of the exploratory borings. If the structure is moved any appreciable distance from the locations of the borings, the soil conditions may not be the same as those reported here. The passage of time may also result in a change in the soil conditions at the boring locations.

The lines defining the change between soil types or rock materials on the attached boring logs and soil profiles are determined by interpolation and therefore are approximations. The transition between soil types may be abrupt or may be gradual.

Laboratory tests were performed on representative soil samples to determine their relative engineering properties. Tests were performed in accordance with test methods of the American Society for Testing and Materials or other accepted standards. The results of our laboratory tests are included in this report. The in-place soil density, moisture content and the standard penetration test values are presented on the attached drilling logs.

FINDINGS

SITE DESCRIPTION

The project site is located in the Northwest Quarter of the Northwest Quarter of Section 18, Township 1 South, Range 1 East of the Ute Principal Meridian, Mesa County, Colorado. More specifically the site is located West of 28 1/4 Road and North of the Gunnison Avenue extension within the Corporate limits of the City of Grand Junction.

The topography of the site is relatively flat, with a very slight overall gradient to the South. The exact direction of surface runoff on this site will be controlled by the proposed construction and therefore will be variable. In general, surface runoff is expected to travel along the proposed interior roadways and East to 28 1/4 Road and an existing drainage or to the Southwest into a holding basin with ultimate discharge to the Southwest. The drainage on the site will probably be directed either to the Indian Wash drainage feature along 28 Road or to the Mesa County Ditch along 28 1/4 Road and ultimately into the Colorado River to the South. Surface and subsurface drainage on this site would be described as poor.

GENERAL GEOLOGY AND SUBSURFACE DESCRIPTION

The geologic materials encountered under the site consist of moderately thick sequence of unconsolidated alluvial soils which are deposited over a thick sequence of sedimentary rocks. The geologic and engineering properties of the materials found in our 3 shallow exploration borings will be

discussed in the following sections.

The soils on this site consist of an alluvial deposit placed by the action of the Colorado River, covered with approximately 30'-32' alluvium/ colluvium transported by mudflows from the hills to the North and Northeast. This stratification of upper soils results in a layered system of silts and clays with thin, interbedded sand lenses overlying a sand/gravel deposit. Generally, the silts and clays are soft, wet and of low density. Soil density decreases and the moisture content increases with increasing depth. The upper 2-8 feet of the soil profile are stiffer and relatively dry due to surface desiccation and some reworking of the ground surface due to previous uranium mill tailings remediation.

The surface soils on this site consisted of essentially 1 soil type which is designated Soil Type I for purposes of this report. This soil type was found to be approximately 32' thick. These soils will probably be somewhat stratified with some clayey silts and possibly sandy silts.

This Soil Type was classified as a silty clay (CL) under the Unified Classification System. This material is of low plasticity, of low to moderate permeability, and was encountered in a low density, wet condition below approximately 6-12'. This soil is found to be relatively dry and of medium density in the upper 3'-6' of the soil profile and may undergo mild expansion with the entry of small amounts of moisture. This soil will exhibit minor expansive properties in the upper few feet of the soil profile and will settle in the lower portions of

the soil profile. The maximum allowable bearing capacity for this soil was found to be 1800 psf, with 750 minimum dead load pressure required for foundations placed in the upper 4' of the soil profile over the majority of the site. If foundations are placed below 4' of the existing ground surface, or if low density soils are encountered in the excavations, the maximum allowable bearing capacity should be reduced to 1000 psf, with 100 psf minimum deadload pressure required. The finer grained portion of Soil Type No. I contains sulfates in detrimental quantities.

These soils were found to contain large amounts of soluble sulfate salts. In general, the sulfate salt content was found to range from 2000 parts per million to as high as 10,000 parts per million (1%). Landscaping using these soils may require some plant types which can tolerate the high soluble salt contents. Any landscaping plans for this project should follow the recommendations found in the Drainage and Gradient portion of this report.

The coarse grained alluvial sandy gravels and cobbles of the Ancient Colorado River Terrace were encountered at a depth of 32' below the ground surface. If heavy structures are anticipated for this project, these gravels and the underlying Mancos Shale would probably be utilized as foundation bearing for either driven piles or drilled piers. Information presently available to Lincoln DeVore indicates that the proposed structures are to be light weight and should not require a deep foundation system. If information regarding deep foundations are required for this site, Lincoln DeVore can provide additional information.

GROUND WATER:

A free water table came to equilibrium during drilling at 7 1/2 feet to 14 1/2 feet below the present ground surface. This is probably not a true phreatic surface but is an accumulation of subsurface seepage moisture (perched water). In our opinion the subsurface water conditions shown are a permanent feature on this site. The depth to free water would be subject to fluctuation, depending upon external environmental effects.

Because of capillary rise, the soil zone within a few feet above the free water level identified in the borings will be quite wet. Pumping and rutting may occur during the excavation process, particularly if the bottom of the foundations are near the capillary fringe. Pumping is a temporary, quick condition caused by vibration of excavating equipment on the site. If pumping occurs, it can often be stopped by removal of the equipment and greater care exercised in the excavation process. In other cases, geotextile fabric layers can be designed or cobble sized material can be introduced into the bottom of the excavation and worked into the soft soils. Such a geotextile or cobble raft is designed to stabilize the bottom of the excavation and to provide a firm base for equipment.

In general, the Northwest portion of the tract appears to exhibit a higher water table. The cause of this relatively high water table are not known but, may be related to area drainage practices and runoff discharge from the K-Mart store to the North and parking lot drainage to the West.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL DISCUSSION

No geologic conditions were apparent during our reconnaissance which would preclude the site development as planned, provided the recommendations contained herein are fully complied with. Based on our investigation to date and the knowledge of the proposed construction, the site condition which would have the greatest effect on the planned development is the slightly expansive soils encountered near the existing ground surface.

Since the exact magnitude and nature of the foundation loads are not precisely known at the present time, the following recommendations must be somewhat general in nature. Any special loads or unusual design conditions should be reported to Lincoln DeVore so that changes in these recommendations may be made, if necessary. However, based upon our analysis of the soil conditions and project characteristics previously outlined, the following recommendations are made.

OPEN FOUNDATION OBSERVATION

Since the recommendations in this report are based on information obtained through random borings, it is possible that the subsurface materials between the boring points could vary. Therefore, prior to placing forms or pouring concrete, an open excavation observation should be performed by representatives of Lincoln DeVore. The purpose of this observa-

tion is to determine if the subsurface soils directly below the proposed foundations are similar to those encountered in our exploration borings. If the materials below the proposed foundations differ from those encountered, or in our opinion, are not capable of supporting the applied loads, additional recommendations could be provided at that time.

EXCAVATION:

Site preparation in any areas to receive structural fill should begin with the removal of all topsoil, vegetation, and other deleterious materials. Prior to placing any fill, the subgrade should be observed by representatives of Lincoln DeVore to determine if the existing vegetation has been adequately removed and that the subgrade is capable of supporting the proposed fills. The subgrade should then be scarified to a depth of 10 inches, brought to near optimum moisture conditions and compacted to at least 90% of its maximum modified Proctor dry density [ASTM D-1557]. The moisture content of this material should be within + or - 2% of optimum moisture, as determined by ASTM D-1557.

In general, we recommend all structural fill in the area beneath any proposed structure or roadway be compacted to a minimum of 90% of its maximum modified Proctor dry density (ASTM D1557). This structural fill should be placed in lifts not to exceed six (6) inches after compaction. We recommend that fill be placed and compacted at approximately its optimum moisture content (+/-2%) as determined by ASTM D 1557. Structural fill should be a granular, non-expansive soil.

Allowable slope angle for cuts in the native soils is dependent on soil conditions, slope geometry, the moisture content and other factors. Should deep cuts be planned for this site, we recommend that a slope stability analysis be performed when the location and depth of the cut is known.

No major difficulties are anticipated in the course of excavating into the surficial soils on the site. It is probable that safety provisions such as sloping or bracing the sides of excavations over 4 feet deep will be necessary. Any such safety provisions shall conform to reasonable industry safety practices and to applicable OSHA regulations. The OSHA Classification for excavation purposes on this site is Soil Class C.

DRAINAGE AND GRADIENT:

Adequate site drainage should be provided in the foundation area both during and after construction to prevent the ponding of water and the saturation of the subsurface soils. We recommend that the ground surface around the structure be graded so that surface water will be carried quickly away from the building. The minimum gradient within 10 feet of the building will depend on surface landscaping. We recommend that paved areas maintain a minimum gradient of 2%, and that landscaped areas maintain a minimum gradient of 8%. It is further recommended that roof drain downspouts be carried across all backfilled areas and discharged at least 10 feet away from the structure. Proper discharge of roof drain downspouts may require the use of subsur-

face piping in some areas. Planters, if any, should be so constructed that moisture is not allowed to seep into foundation areas or beneath slabs or pavements.

To give the buildings extra lateral stability and to aid in the rapidity of runoff, it is recommended that all backfill around the building and in utility trenches in the vicinity of the building be compacted to a minimum of 85% of its maximum Proctor dry density, ASTM D 698. The native soils on this site may be used for such backfill. We recommend that all backfill be compacted using mechanical methods. No water flooding techniques of any type may be used in placement of fill on this site.

Should an automatic lawn irrigation system be used on this site, we recommend that the sprinkler heads be installed no less than 5 feet from the building. In addition, these heads should be adjusted so that spray from the system does not fall onto the walls of the building and that such water does not excessively wet the backfill soils.

It is recommended that lawn and landscaping irrigation be reasonably limited, so as to prevent undesirable saturation of subsurface soils or backfilled areas. Several methods of irrigation water control are possible, to include, but not limited to:

* Metering the Irrigation water.
* Sizing the irrigation distribution service piping to limit on-site water usage.
* Encourage efficient landscaping practices.
* Enforcing reasonable limits on the size of high water usage landscaping for each lot and any park areas.

FOUNDATIONS

We recommend the use of a conventional shallow foundation system consisting of continuous spread footings beneath all bearing walls and isolated spread footings beneath all columns and other points of concentrated load. Such a shallow foundation system, resting on the native alluvial and possibly reworked surface soils, may be designed on the basis of an allowable bearing capacity of 1800 psf maximum. A minimum dead load of 750 psf must be maintained. If soft soils are encountered in the excavation or if the excavations are deeper than 4' below the existing ground surface, the maximum allowable bearing capacity should be reduced to 1000 psf and a minimum deadload of 100 psf must be maintained.

Contact stresses beneath all continuous walls should be balanced to within + or -150 psf at all points. Isolated interior column footings should be designed for contact stresses of about 150 psf less than the average used to balance the continuous walls. The criterion for balancing will depend somewhat upon the nature of the structure. Single-story, slab on grade structures may be balanced on the basis of dead load only. Multi-story structures may be balanced on the basis of dead load plus 1/2 live load, for up to 3 stories.

It should be noted that the term "footings" as used above includes the wall on grade or "no footing" type of foundation system. On this particular site, the use of a more conventional footing, the use of a "no footing", or the use of voids will depend entirely upon the foundation loads exerted

by the structure. We would anticipate the use of a relatively narrow standard footing or possibly a no-footing type foundation on this site.

Stem walls for a shallow foundation system should be designed as grade beams capable of spanning at least 12 feet. These "grade beams" should be horizontally reinforced both near the top and near the bottom. The horizontal reinforcement required should be placed continuously around the structure with no gaps or breaks. A foundation system designed in this manner should provide a rather rigid system and, therefore, be better able to tolerate differential movements associated with the relatively low expansive pressures exerted by the native soils and possible areas of settlement associated with low density soils.

SETTLEMENT:

We anticipate that total and/or differential settlements for the proposed structures may be considered to be within tolerable limits, provided the recommendations presented in this report are fully complied with. In general, we expect total settlements for the proposed structure to be less than 1 inch.

FROST PROTECTION

We recommend that the bottom of all foundation components rest a minimum of 1 1/2 feet below finished grade or as required by the local building codes. Foundation components must not be placed on frozen soils.

CONCRETE SLABS ON GRADE

Slabs could be placed directly on the natural soils or on a structural fill. We recommend that all slabs on grade be constructed to act independently of the other structural portions of the building. One method of allowing the slabs to float freely is to use expansion material at the slab-structure interface.

If the slab is to be placed directly on the expansive soils or on a thin fill overlying these soils, the risk of slab movement is high and stringent mitigation techniques are recommended. No design method known at this time will prevent slab movement should moisture enter the expansive soils below. Therefore, to mitigate the effects of slab movement should they occur, we recommend the following:

1. Control joints should be placed in such a manner that no floor area exceeding 400 square feet remains without a joint. Additional joints should be placed at columns and at inside corners. These control joints should minimize cracking associated with expansive soils by controlling location and direction of cracks.

2. We recommend that all slabs on grade be isolated from all structural members of the building. This is generally accomplished by an expansion joint at the floor slab / foundation interface. In addition, positive separation should be maintained between the slab and all interior columns, pipes and mechanical systems extending through the slab.

3. The slab subgrade should be kept moist 3 to 4 days prior to placing the slab. This is done by periodically sprinkling the subgrade with water. However, under no circumstances should the subgrade be kept wet by the flooding or ponding water.

4. Any partitions which will rest on the slabs on grade should be constructed with a minimum void space of 1-

1/2 inches at the bottom of the wall (see figure in the Appendix). This base should allow for future upward movement of the floor slabs and minimize movement and damage in walls and floors above the slabs. This void may require rebuilding after a period of time, should heave exceed 1-1/2 inches.

Problems associated with slab 'curling' are usually minimized by proper curing of the placed concrete slab. This period of curing usually is most critical within the first 5 days after placement. Proper curing can be accomplished by continuous water application to the concrete surface or, in some instances by the placement of a 'heavy' curing compound, formulated to minimize water evaporation from the concrete. Curing by continuous water application must be carefully undertaken to prevent the wetting or saturation of the subgrade soils.

EARTH RETAINING STRUCTURES

The active soil pressure for the design of earth retaining structures may be based on an equivalent fluid pressure of 62 pounds per cubic foot. The active pressure should be used for retaining structures which are free to move at the top (unrestrained walls). For earth retaining structures which are fixed at the top, such as basement walls, an equivalent fluid pressure of 78 pounds per cubic foot may be used. It should be noted that the above values should be modified to take into account any surcharge loads, sloping backfill or other externally applied forces. The above equivalent fluid pressures should also be modified for the effect of free water, if any.

The passive pressure for resistance to lateral movement may be considered to be 180 pcf per foot of depth. The coefficient of friction for concrete to soil may be assumed to be 0.2 for resistance to lateral movement. When combining frictional and passive resistance, the latter must be reduced by approximately 1/3.

REACTIVE SOILS

Since groundwater in the Grand Junction area typically contains sulfates in quantities detrimental to a Type I cement, a Type II or Type I-II or Type II-V cement is recommended for all concrete which is in contact with the subsurface soils and bedrock. Calcium chloride should not be added to a Type II, Type I-II or Type II-V cement under any circumstances.

LIMITATIONS

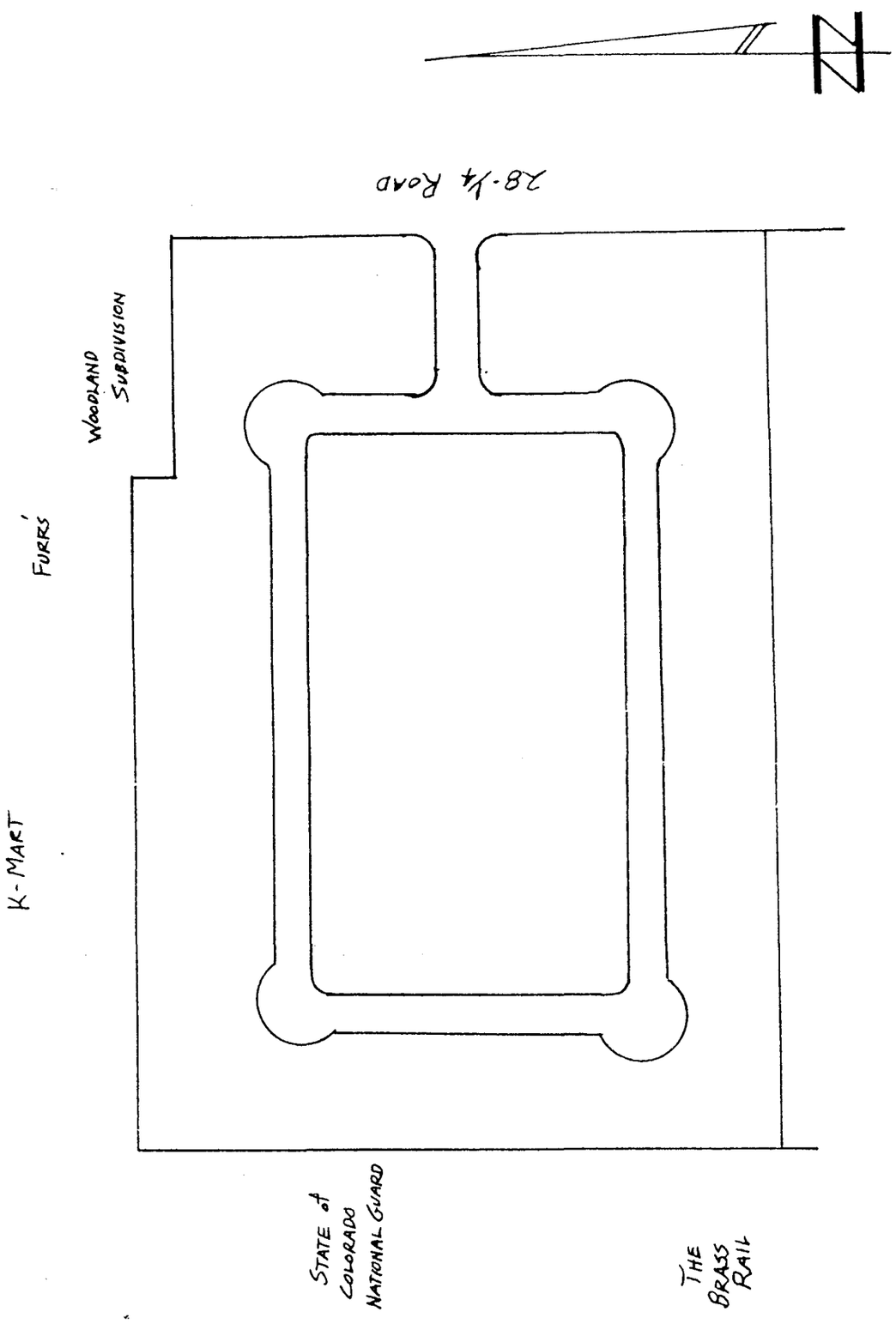
This report is issued with the understanding that it is the responsibility of the owner, or his representative to ensure that the information and recommendations contained herein are brought to the attention of the individual lot purchasers for the subdivision. In addition, it is the responsibility of the individual lot owners that the information and recommendations contained herein are brought to the attention of the architect and engineer for the individual projects and the necessary steps are taken to see that the contractor and his subcontractors carry out the appropriate recommendations during construction.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in acceptable or appropriate standards may occur or may result from legislation or the broadening of engineering knowledge. Accordingly, the findings of this report may be invalid, wholly or partially, by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of 3 years.

The recommendations of this report pertain only to the site investigated and are based on the assumption that the soil conditions do not deviate from those described in this report. If any variations or undesirable conditions are encountered during construction or the proposed

construction will differ from that planned on the day of this report, Lincoln DeVore should be notified so that supplemental recommendations can be provided, if appropriate.

Lincoln DeVore makes no warranty, either expressed or implied, as to the findings, recommendations, specifications or professional advice, except that they were prepared in accordance with generally accepted professional engineering practice in the field of geotechnical engineering.



Lincoln DeVore, Inc.
Geotechnical Consultants

NIAGARA VILLAGE - GRAND JUNCTION, CO.		
MR. SIDNEY SPIVAK, Q.C.		DATE 10-3-95
JOB NO. 84110-J	DRAWN EMM	No SCALE

SOILS DESCRIPTIONS:

SYMBOL	USCS	DESCRIPTION
		Topsoil
		Man-made Fill
	GW	Well-graded Gravel
	GP	Poorly-graded Gravel
	GM	Silty Gravel
	GC	Clayey Gravel
	SW	Well-graded Sand
	SP	Poorly-graded Sand
	SM	Silty Sand
	SC	Clayey Sand
	ML	Low-plasticity Silt
	CL	Low-plasticity Clay
	OL	Low-plasticity Organic Silt and Clay
	MH	High-plasticity Silt
	CH	High-plasticity Clay
	OH	High-plasticity Organic Clay
	Pt	Peat
	GW/GM	Well-graded Gravel, Silty
	GW/GC	Well-graded Gravel, Clayey
	GP/GM	Poorly-graded Gravel, Silty
	GP/GC	Poorly-graded Gravel, Clayey
	GM/GC	Silty Gravel, Clayey
	GC/GM	Clayey Gravel, Silty
	SW/SM	Well-graded Sand, Silty
	SW/SC	Well-graded Sand, Clayey
	SP/SM	Poorly-graded Sand, Silty
	SP/SC	Poorly-graded Sand, Clayey
	SM/SC	Silty Sand, Clayey
	SC/SM	Clayey Sand, Silty
	CL/ML	Silty Clay

ROCK DESCRIPTIONS:

SYMBOL	DESCRIPTION
SEDIMENTARY ROCKS	
	CONGLOMERATE
	SANDSTONE
	SILTSTONE
	SHALE
X X X X X X	CLAYSTONE
	COAL
	LIMESTONE
	DOLOMITE
	MARLSTONE
	GYPSUM
	Other Sedimentary Rocks
IGNEOUS ROCKS	
	GRANITIC ROCKS
	DIORITIC ROCKS
	GABBRO
	RHYOLITE
	ANDESITE
	BASALT
	TUFF & ASH FLOWS
	BRECCIA & Other Volcanics
	Other Igneous Rocks
METAMORPHIC ROCKS	
	GNEISS
	SCHIST
	PHYLLITE
	SLATE
	METAQUARTZITE
	MARBLE
	HORNFELS
	SERPENTINE
	Other Metamorphic Rocks

SYMBOLS & NOTES:

SYMBOL	DESCRIPTION
	9/12 Standard penetration drive Numbers indicate 9 blows to drive the spoon 12" into ground.
	ST 2-1/2" Shelby thin wall sample
	W_o Natural Moisture Content
	W_x Weathered Material
Free water	Free water table
	γ^o Natural dry density
	T.B. – Disturbed Bulk Sample
	② Soil type related to samples in report
15' W_x Form.	Top of formation
	Test Boring Location
	Test Pit Location
	Seismic or Resistivity Station. Lineation indicates approx. length & orientation of spread (S = Seismic, R = Resistivity)

Standard Penetration Drives are made by driving a standard 1.4" split spoon sampler into the ground by dropping a 140 lb. weight 30". ASTM test des. D-1586.

Samples may be bulk, standard split spoon (both disturbed) or 2-1/2" I.D. thin wall ("undisturbed") Shelby tube samples. See log for type.

The boring logs show subsurface conditions at the dates and locations shown, and it is not warranted that they are representative of subsurface conditions at other locations and times.

LINCOLN DeVORE INC.

COLORADO SPRINGS
PUEBLO – GRAND JUNCTION

EXPLANATION OF BOREHOLE LOGS AND LOCATION DIAGRAMS

BORING NO. 1

DEPTH (FT.)	SOIL LOG	BORING ELEVATION: DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		Sulfates on Ground Surface				
		COMPACTED				
		LOW EXPANSION — VERY HIGH SULFATES				
	CL	Very SILTY CLAY	ST		104.4	9.0%
5	I	ALLUVIAL — SI. MOIST	5			
		LOW DENSITY				
		Occ. MEDIUM DENSITY STRATA				
	CL	Very SILTY CLAY SLIGHTLY EXPANSIVE	CS	9/6	103	19.0%
10	I	INCREASING MOISTURE	10	20/12		
		ALLUVIAL CLAYS		32/18		
		VERY HIGH SULFATES				
		VERY SOFT to DRILL				
	CL	COMPRESSIBLE	SPT	2/6		22.6%
15		**Free Water** ▽	15	5/12		
	I	Very SILTY CLAY — COMPRESSIBLE		8/18		
		HOLE IS SQUEEZING SHUT				
20		VERY SOFT	20			
		COMPRESSIBLE				
25			25			
30			BULK 30			25.7%
		Blow Counts are cumulative for each				
	GM	6 inches of sampler penetration.				
		Sandy Gravel — **Free Water @ 14-1/2'**				
		During Drilling 9-22-95				

LOG OF SUBSURFACE EXPLORATION

NIAGARA VILLAGE SUBDIVISION
Gunnison & 28-1/4 Road, Grd. Jct, Co.

LINCOLN - DeVORE, Inc.
Geotechnical Consultants
Grand Junction, Colorado

Mr. Sidney Spivak Q.C.
LANDesign Consultants

Date **9-26-95**

Job No. **84110-J**

Drawn **EMM**

BORING NO. **2**

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION			BLOW COUNT	SOIL DENSITY pcf	WATER %
		6" of MAN-MADE FILL 'PITRUN'					
		COMPACTED VERY HIGH SULFATES					
		LOW EXPANSION					
	CL	Very SILTY CLAY	ALLUVIAL	SPT	6/6		15.9%
5	I	SILT STRATA	MOIST	5	11/12		
			VERY HIGH SULFATES		17/18		
		Occ. MEDIUM DENSITY STRATA					
	CL	Very SILTY CLAY	SLIGHTLY EXPANSIVE	ST		109.3	15.6%
10	I		INCREASING MOISTURE	10			
		ALLUVIAL CLAYS					
			DECREASING DENSITY				
	CL	Very SILTY CLAY	COMPRESSIBLE	CT	4/6	97.4	21.4%
15	I	SILT STRATA		15	9/12		
			VERY SOFT to DRILL		14/18		
		Free Water					
20				20			
25				25			
30				30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.					
		Free Water @ 12'					
		During Drilling 9-22-95					

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

NIAGARA VILLAGE SUBDIVISION

Gunnison & 28-1/4 Road, Grd. Jct, Co.

Mr. Sidney Spivak Q.C.
LANDesign Consultants

Date **9-26-95**

Job No. **84110-J**

Drawn **EMM**

BORING NO. 3

DEPTH (FT.)	SOIL LOG	BORING ELEVATION: DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		COMPACTED GROUND SURFACE				
		EXPANSIVE VERY HIGH SULFATES				
		MEDIUM to HIGH DENSITY				
	CL	Very SILTY CLAY SLIGHTLY EXPANSIVE MOIST	CT	7/6	119.8	11.2%
5	I	INCREASING MOISTURE	5	17/12		
		ALLUVIAL CLAYS HIGH SULFATES		26/18		
		DECREASING DENSITY				
		Free Water ▽				
	CL	Very SILTY CLAY COMPRESSIBLE	SPT	2/6		25.5%
10	I	SILT STRATA	10	3/12		
		VERY SOFT to DRILL		4/18		
	CL	Very SILTY CLAY	ST		92.3	24.1%
15	I	COMPRESSIBLE	15			
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		Free Water @ 7-1/2'				
		During Drilling 9-22-95				

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.
Geotechnical Consultants
Grand Junction, Colorado

NIAGARA VILLAGE SUBDIVISION
Gunnison & 28-1/4 Road, Grd. Jct, Co.

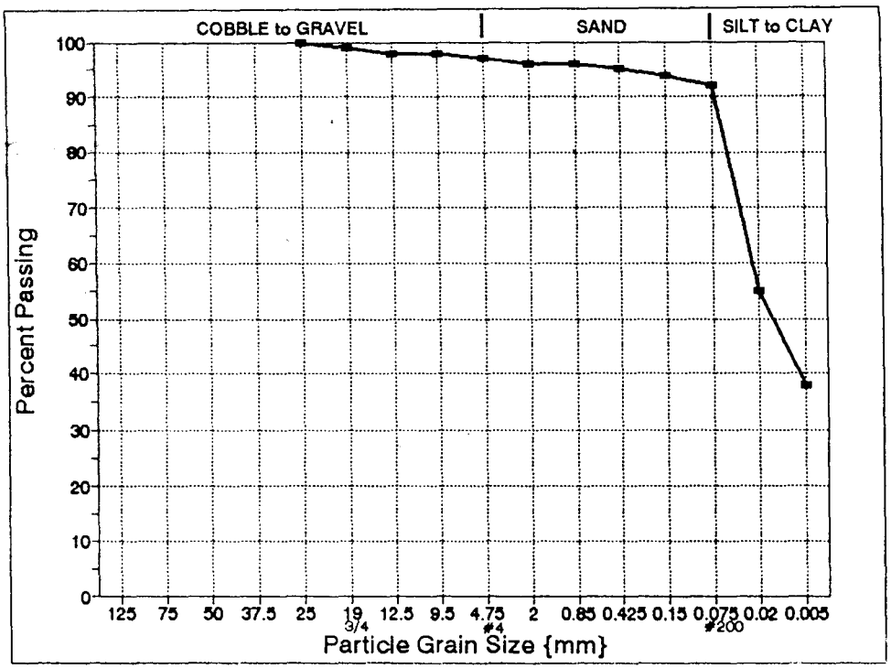
Mr. Sidney Spivak Q.C.
LANDesign Consultants

Date **9-26-95**

Job No. **84110-J**

Drawn **EMM**

Soil Sample:	**Very Silty Clay (CL)**	Sample No.:	**(Typical)**	2
Location:	**Niagara Village, Grand Junction**	Test by:	**LRS**	
Natural Water Content (w):	**15.6%**	Boring No.:	**2**	Depth: **8'**
Soil Specific Gravity (Gs):	**2.66**	In-Place Density (pcf):	**109.3**	



Effective size mm

Cu

Cc

Plastic Limit (PL)	21	%
Liquid Limit (LL)	31	%
Plasticity Index (PI)	10	%
Shrinkage Limit (SL)		%
Shrinkage Ratio		%

DIRECT SHEAR:

Shear Angle:	deg.
Tan Shear Angle:	
Cohesion:	psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	100
3/4"	19	99
1/2"	12.5	98
3/8"	9.5	98
# 4	4.75	97
#10	2	96
#20	0.85	96
#40	0.425	95
#100	0.15	94
#200	0.075	92.1
	0.02	55
	0.005	38

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density pcf:

Optimum Moisture %:

HVEEM-CARMANY:		**FHA Soil Swell:**
'R' Value @ 300 psi:	9	% Swell
Displacement 300 psi:	4.57	psf
Expansion @ 300 psi:	17.3	

ALLOWABLE BEARING (net):

Standard Penetration (SPT):			1800	psf
Unconfined Compression (qu):				psf
CONSOLIDATION:	0.44	%	901	psf
	1.02	%	2007	psf
SULFATE SALTS:	+2000	ppm		

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

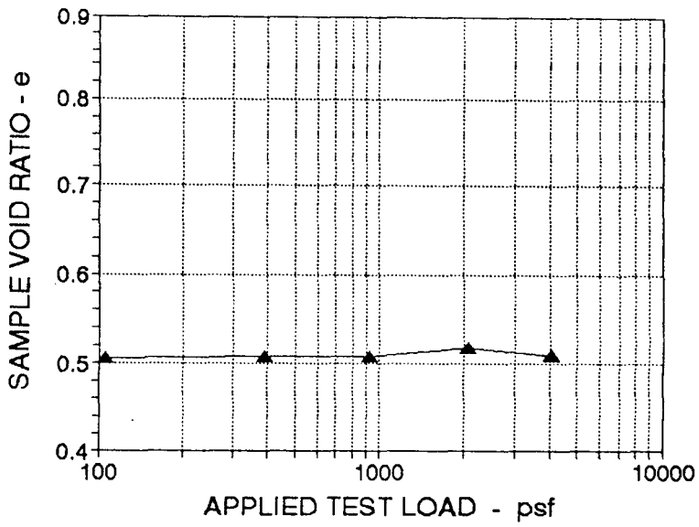
NIAGARA VILLAGE SUBDIVISION

Gunnison & 28-1/4 Road, Grd. Jct, Co.

Mr. Sidney Spivak Q.C.
LANDesign Consultants

Date **9-26-95**

Job No.	Drawn	
84110-J	**EMM**	



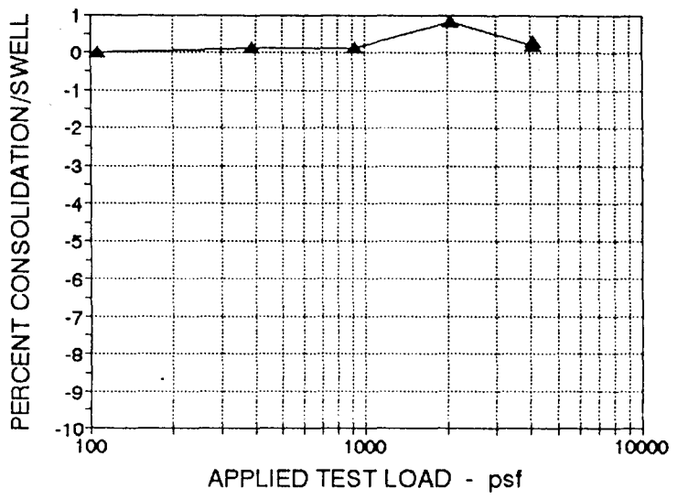
The Consolidation Test (ASTM D-2435) Was Run By First Subjecting The Soil Specimen To A 'Seating' Load.

The 'Seating' Load Is To Remove Slack From The Apparatus And To Provide An Accurate Point of Beginning.

The Test Begins With The Specimen At Approximately Natural Moisture Content.

The Sample is Loaded to Approximately 4069 psf And Then Saturated With Water.

The Constant Swelling Of The Specimen Is Noted And The Loading Is Continued.



LOAD SUMMARY

106	*psf SEATING LOAD*
4069	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0.84	*% SOIL EXPANSION/SWELL*
-0.3	*% SAMPLE REBOUND @ UNLOAD*
0	*% MAXIMUM CONSOLIDATION*
4069	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	110.2	110.0	109.9
SOIL MOISTURE (%)	13.5%	19.1%	19.2%
CONSOLIDATION (%)	-0-	-0.30%	0.00%
VOID RATIO (e)	0.506	0.509	0.510
SATURATION (%)	71%	100%	100%

SOIL #:	I
SOIL TYPE:	CL
TEST HOLE #:	#1 @ 3'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

NIAGARA VILLAGE SUBDIVISION

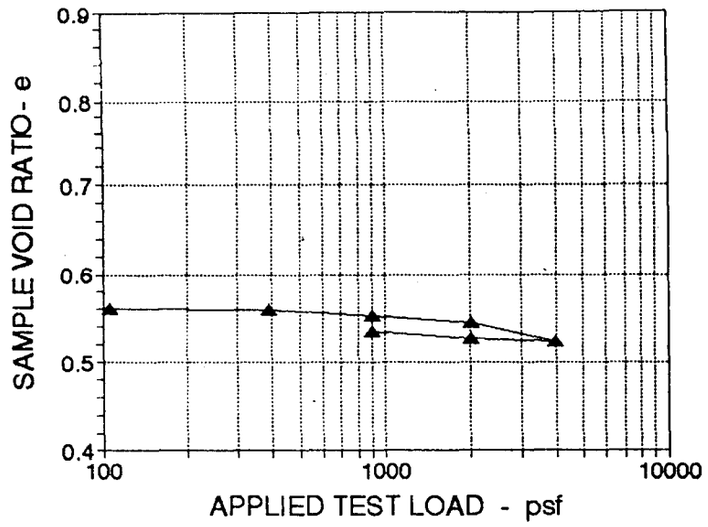
Gunnison & 28-1/4 Road, Grd. Jct, Co.

Mr. Sidney Spivak Q.C.
LANDesign Consultants

Date **9-26-95**

Job No. **84110-J**

Drawn **EMM**



The Consolidation Test (ASTM D-2435) Was Run By First Subjecting The Soil Specimen To A 'Seating' Load.

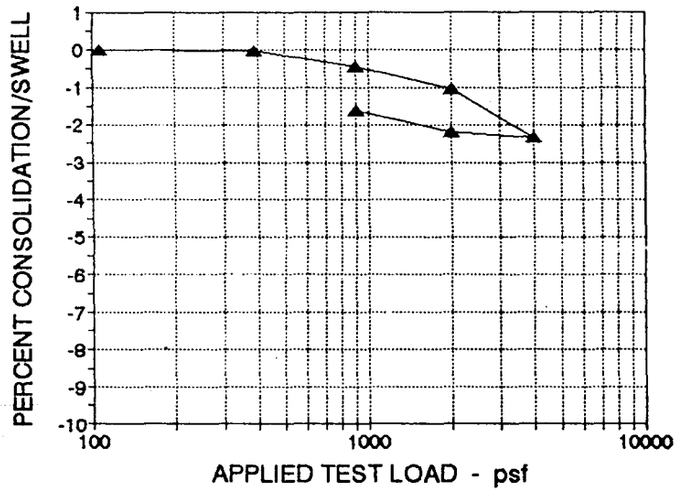
The 'Seating' Load Is To Remove Slack From The Apparatus And To Provide An Accurate Point of Beginning.

The Test Begins With The Specimen At Approximately Natural Moisture Content.

The Sample is Loaded to Approximately 900 psf And Then Saturated With Water.

Any Swell Or Collapse Of The Specimen Is Noted And The Loading Is Continued.

After The Maximum Test Load, The Soil Specimen Is Unload, To Measure Rebound And Swelling Potential, After Consolidation.



LOAD SUMMARY

106	*psf SEATING LOAD*
901	*psf SAMPLE SATURATED*
	% SOIL COLLAPSE
	% SOIL EXPANSION/SWELL
0.72	*% SAMPLE REBOUND @ UNLOAD*
2.33	*% MAXIMUM CONSOLIDATION*
3990	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	106.0	108.5	107.7
SOIL MOISTURE (%)	18.1%	19.8%	20.2%
CONSOLIDATION (%)	-0-	2.33%	1.61%
VOID RATIO (e)	0.560	0.524	0.535
SATURATION (%)	86%	100%	100%

SOIL #:	I
SOIL TYPE:	CL
TEST HOLE #:	#2 @ 8'
SAMPLE Gs:	2.65
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

NIAGARA VILLAGE SUBDIVISION

Gunnison & 28-1/4 Road, Grd. Jct, Co.

Mr. Sidney Spivak Q.C.
LANDesign Consultants

Date **9-26-95**

Job No. **84110-J**

Drawn **EMM**

Final Plan Narrative For:

NIAGARA VILLAGE FILING NO. ONE

September 25, 1995

Prepared for;

Waterloo Nevada Limited
P.O. Box 98, Station L
Winnipeg, Manitoba, R3H OZ4 Canada

Prepared by;

LANDesign L.L.C.
200 North 6th. Street
Grand Junction, Colorado 81501
(303) 245-4099

LOCATION - Niagara Village contains approximately 14.5 acres. The subject property is located in the east/central area of Grand Junction, Colorado, west of 28 1/4 Road and one quarter mile south of North Avenue. The property is located in part of the NW 1/4 of Section 18, Township One South, Range One East, of the Ute Meridian.

EXISTING LAND USE - The site is currently vacant of any structures and is in a fallow state. No recent agricultural production has occurred on the property. Topography of the property is considered to be "flat" in nature. The land within Niagara Village slopes towards the southwest at a average rate of one percent. Several years ago the City zoned the property PR-20 for multi-family dwellings, and PB (Planned Business).

SURROUNDING LAND USE - The Surrounding land use in the vicinity of the subject property is considered to be of high intensity. Predominately non-residential uses, which includes:

NORTH
Kmart
Furr's Cafeteria
Appliance Repair

SOUTH
Vacant Undeveloped Land

EAST
Vacant Undeveloped Land

WEST
National Guard Armory
The Brass Rail Lounge
Convenience Store
Shop Building
Indian Wash

A Location Map at the end of the narrative statement illustrates the location of Niagara Village in relationship to the surrounding land ownership. A reproduction from the City of Grand Junction Zoning Map can be found on the following page:

PROPOSED LAND USE - The proposal calls for the ultimate development of 83 manufactured home sites on 14.5 acres. The resulting density is 5.7 dwelling units per acre. The accompanying Preliminary Plan depicts the relationship of each site to the property boundary, roadway access, and other features of the proposed development.

In addition to the individual lot development standards presented herein, strict controls will be instigated to protect the development from undesirable influences. To achieve this, a set of Covenants, Conditions and Restrictions recorded to insure ongoing protection to the future residents of Niagara Village and surrounding property owners. Additionally a set of Landscape Guidelines will be provided to each lot owner. These guidelines will include minimum landscape, fencing, and storage requirements.

LAND USE SUMMARY CHART

Use	Area	% of total
Streets	2.5	17
Lots	12.0	83
Total	14.3	100
Single Wide Sites	47	
Double Wide Sites	36	
Total Sites	83	
Density	5.7 du/ac	
Total Off Street Parking	245	

ACCESS -
Primary access to Niagara Village will be from 28 1/4 Road which is designated as a collector by the City. Review of the accompanying Location Map reveal that existing access is available to North Avenue, a major east/west arterial. 28 Road, a collector, is located 300 feet west of the subject site. It can be assumed that as the undeveloped area south of Niagara Village develops, additional access points will be available.

Proposed roadway improvements call for the construction of approximately 2160 feet of new public street. The proposal includes an oversized single point of access to 28 1/4 Road. The proposal also calls for the construction of one-half width plus one additional driving lane along 28 1/4 Road for it's entire length of the properties frontage.

According to Trip Generation studies by the Institute of Transportation Engineers, approximately 830 average total daily trips would occur after site development is complete

UTILITY SERVICE

DOMESTIC WATER - All spaces within Niagara Village will be served by a domestic water distribution system. An existing 6 inch water main located adjacent to the northeast property corner will be extended into the site to provide water service to lots within the development. The new 8 inch main will be extended across the site to an existing 12 inch main in 28 Road and will provide water for fire protection. The existing water mains are owned and maintained by the City of Grand Junction. Sufficient flows and pressure should exist to provide adequate water supply for fire protection.

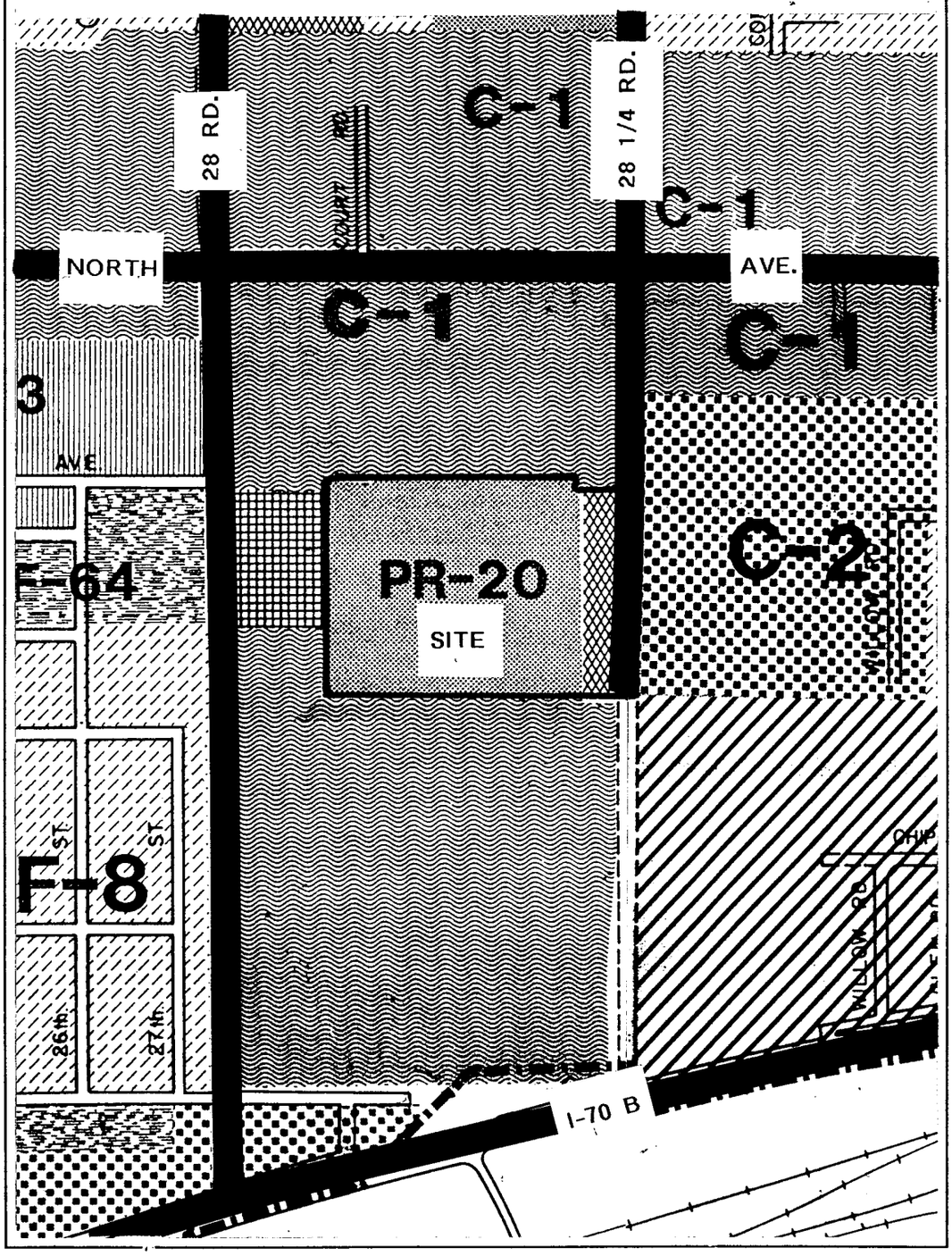
SANITARY SEWER - A new sanitary sewage collection system will be constructed to serve all lots within Niagara Village. The Fruitvale Sanitation District will administer sewer service to the development from an existing main which is located in 28 Road. It is estimated that peak sewage flows generated by the lots within the development will be 25,000 gallons per day.

ELECTRIC, GAS PHONE AND CTV - Electric, gas and communication lines will be extended to each site within the development from existing lines located adjacent to the proposed development.

DRAINAGE - A Drainage Report which evaluated the impacts on existing drainage patterns has been submitted to the City's Engineering and Community Development departments under separate cover. Future drainage will be carried on the ground surface to the proposed street system to a point near the southwest corner of the development. A new storm sewer pipeline will be constructed to discharge stormwater directly into the Indian Wash located adjacent to 28 Road.

DEVELOPMENT SCHEDULE - The rate at which development of Niagara Village will occur is dependent upon the City's future growth and housing needs. At this point in time it is anticipated that site development for the first three phases will begin upon the City's acceptance of the Final Plant and Plan. The first phase will consist of 27 lots adjacent to the site's easterly boundary.

SURROUNDING ZONING MAP



STORMWATER MANAGEMENT PLAN

FOR

NIAGARA VILLAGE SUBDIVISION

August, 1995

Prepared For:

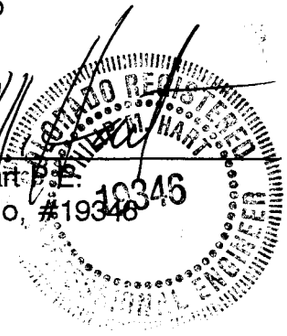
Irving Nacht
950 Borebank Street
Winnipeg, Manitoba, Canada R3C 3H9

Prepared By:

LANDesign
200 North 6th Street, Grand Junction, Colorado 81501
(303) 245-4099

Prepared by: _____
Monty D. Stroup

Reviewed and Approved by: _____
Philip M. Hart, P.E.
State of Colorado, #19346



A. Site and Project Description

1. Site Location:

Niagara Village Subdivision contains approximately 14.5 acres and is located within the City of Grand Junction. The property is located in the NW 1/4 of the NW 1/4 of Section 18, Township One South, Range One East, of the Ute Meridian.

Streets in the vicinity include 28 1/4 Road which defines the east boundary of the site, North Avenue 600 feet to the north, and 28 Road 280' to the west. Access to the site is attained from 28 1/4 Road.

Development in the vicinity is mixed use in nature. To the north lies K-Mart, Furr's Cafeteria and Appliance Repair. To the south and east are vacant lands. To the west is The Colorado National Guard Armory, The Brass Rail Lounge, a Convenience Store and a Shop Building.

2. Description of Property:

The project site contains approximately 14.5 acres. The site is vacant of structures and is in a fallow state. Recent agricultural production has not occurred on the property.

Approximately 100 percent of the onsite historic sub-basin drains from the northeast to the southwest in a sheetflow fashion towards an existing ditch along the south property line of the site. The flow within this ditch is conveyed west to Indian Wash.

The site is affected by offsite runoff from a small sub-basin northeast of site. Runoff from areas north of the site including K-Mart and Furr's is intercepted by parking lot grading elements and is directed west away from the site towards 28 Road. Topography of the property is flat in nature and slopes from the northeast to the southwest at approximately 0.75 percent.

3. Description of Proposed Construction Activity:

Activity shall include the construction of roadway, water, sanitary sewer, storm sewer, irrigation, dry utility infrastructures followed by the construction of 83 single family manufactured residential structures and associated landscaping.

4. Proposed Sequence of Major Construction Activities:

Phase I Clearing and grubbing of proposed roadway alignments and disposal of construction debris.

Phase II Construction of roadways to proposed subgrade elevations including cut and fill activities as required. Excess embankment material to be stockpiled in designated areas.

Phase III Utility infrastructures to be installed including storm sewers and culverts, swales and permanent erosion control features.

Phase IV Curb, gutter and sidewalks installed.

Phase V Clearing, Grubbing and overlot grading of single or multiple lots as sales and market conditions allow.

Phase VI Construction of building structures as sales and market conditions allow.

Phase VII Final landscaping of individual lots as required by the project Covenants, Conditions and Restrictions.

5. Estimate of Areas Subject to Clearing, Grubbing and Excavation:

Niagra Village contains a total of 14.5 acres. Construction Phases I will consist of approximately 5.1 acres. Phases II will consist of the residual area of 9.4 acres.

6. Preconstruction and Postconstruction Runoff Coefficients:

As defined in the Master Drainage Report For Niagara Village (References 8) the historic runoff coefficients for the 2 year and 100 year storm events respectively are 0.20 and 0.26.
With the construction of proposed roadways coefficients are expected to increase to 0.45 and 0.53 respectively.

7. Soil Erosion Potential:

Based on the "Soil Survey, Mesa County Area" (Reference 4, Exhibit 3.0) onsite soils are defined as (Bc), Billings silty clay loam, 0 to 2 percent slopes, hydrological soil group "C".

cut and fill slopes shall be revegitated with a annual and perennial seed mixture.

Dust Abatement The contractor shall be required to provide a consistent and reliable source of construction water. Watering to prevent dust shall be ongoing for the duration of the project. In the event high winds and heavy traffic loads create a situation where watering by itself is not sufficient the contractor is to apply an approved dust palliative other than or in addition to water.

Soil Tracking Where construction traffic enters or exits unimproved areas onto asphalted public roadways a crushed rock construction staging pad shall be installed to minimize soil tracking.

Waste Disposal Construction debris shall be stockpiled in a central location. Debris shall be removed from the site and disposed of at appropriate locations secured by the contractor.

Sedimentation Control The contractor shall be responsible for inspecting the entire site on a weekly basis to ensure compliance and identify existing or potential sedimentation problems.

Final Stabilization and Long Term Management

The project's Covenants Conditions and Restrictions obligate each lot owner to fully landscape front yard within 60 days and the rear yard within 1 year from the issuance of a Certificate of Occupancy. Other areas including open-space are to be landscaped by the developer and maintained by the Homeowners Association.

Permanent structural BMP's include pipe outlet protection, rip-rap over filter fabric and grassed swales as shown on the Drainage and Grading Plan.

Inspection and Maintenance

The Contractor shall be ultimately responsible for compliance and maintenance during construction. The owners representative and the contractor shall make weekly inspections of the site to assure compliance and implementation of the proposed BMPs.

V. References

1. Mesa County Storm Drainage Criteria Manual, Final Draft, Mesa County, Colorado, March 1992.

2. Flood Hazard Information, Colorado River and Tributaries, Grand Junction, Colorado, prepared for the City of Grand Junction and Mesa County, by The Department Of The Army, Sacramento District, Corps Of Engineers, Sacramento, California, November, 1976.

3. Flood Insurance Rate Map, Mesa County, Colorado, (Unincorporated Areas), Community Panel Number 080115 0480 C, Federal Emergency Management Agency, Map Revised July 15th, 1992.

4. Soil Survey, Grand Junction Area, Colorado, Series 1940, No. 19, U.S. Department of Agriculture, issued November, 1955.

5. Urban Storm Drainage Criteria Manual, Urban Drainage and Flood Control District, prepared by Wright-McLaughlin Engineers, March 1969, Revised May, 1984.

6. Interim Outline of Grading and Drainage Criteria, City of Grand Junction, July 1992.

7. Douglas County Storm Drainage Design and Technical Criteria, Addendum A, Erosion Control Criteria, prepared by HydroDynamics Incorporated, Parker, Colorado, October, 1992.

8. Master Drainage Report for: Niagara Village Subdivision, prepared by LANDesign, LLC, August 1995.

9. Colorado Department of Transportation, Erosion Control and Stormwater Quality Guide, Draft version, November 27, 1992.

APPENDIX

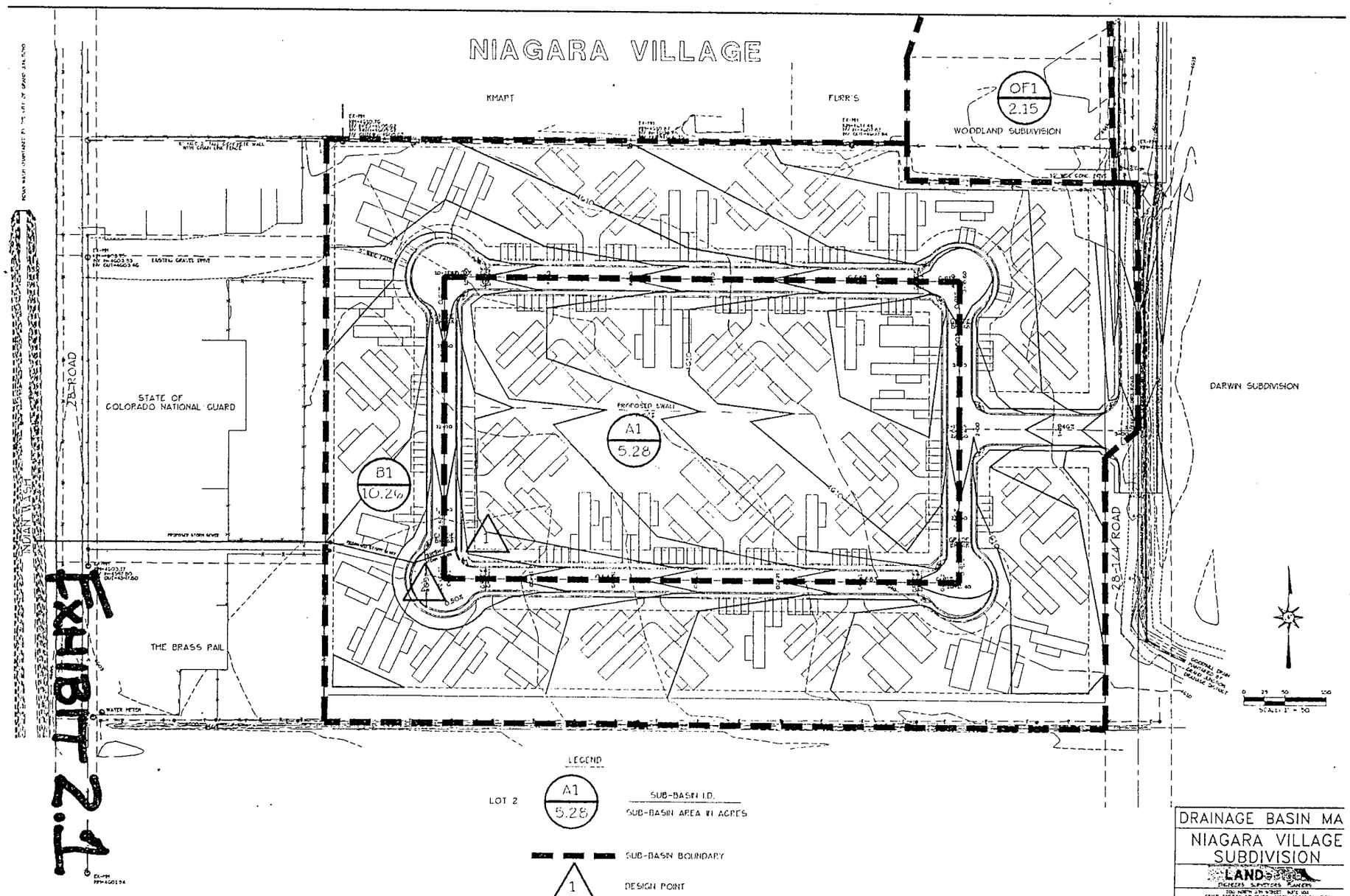

NIAGARA VILLAGE
KMART
FURR'S
OF1
2.15
WOODLAND SUBDIVISION
DARWIN SUBDIVISION
INDIANA ST.
28 ROAD
STATE OF
COLORADO NATIONAL GUARD
THE BRASS RAIL
A1
5.28
B1
10.26
PROPOSED SWALE
28 1/4 ROAD
LEGEND
LOT 2
A1
5.28
SUB-BASIN I.D.
SUB-BASIN AREA IN ACRES
SUB-BASIN BOUNDARY
1
DESIGN POINT
SCALE 1" = 50'
DRAINAGE BASIN MA
NIAGARA VILLAGE
SUBDIVISION
LAND
PIONEERS SURVEYORS PLANNERS

Exhibit 2.1

MASTER DRAINAGE REPORT FOR:

NIAGARA VILLAGE SUBDIVISION

August, 1995

Prepared For:

Irving Nacht
950 Borebank Street
Winnipeg, Manitoba, Canada R3C 3H9

Prepared By:

LANDesign
200 North 6th Street, Grand Junction, Colorado 81501
(303) 245-4099

Prepared By: _____
Monty D. Stroup

"I hereby certify that this report for the preliminary drainage design of the Niagara Village Subdivision was prepared under my direct supervision."

Reviewed By: _____
Philip M. Hart, P.E.
State of Colorado, #19346

I. General Location and Description

A. Site and Major Basin Location:

Niagara Village Subdivision contains approximately 14.5 acres and is located within the City of Grand Junction. The property is located in the NW 1/4 of the NW 1/4 of Section 18, Township One South, Range One East, of the Ute Meridian.

Streets in the vicinity include 28 1/4 Road which defines the east boundary of the site, North Avenue 600 feet to the north, and 28 Road 280' to the west. Access to the site is attained from 28 1/4 Road.

Development in the vicinity is mixed use in nature. To the north lies K-Mart, Furr's Cafeteria and Appliance Repair. To the south and east are vacant lands. To the west is The Colorado National Guard Armory, The Brass Rail Lounge, a Convenience Store and a Shop Building.

B. Site and Major Basin Description:

The project site contains approximately 14.5 acres. The site is vacant of structures and is in a fallow state. Recent agricultural production has not occurred on the property.

Based on the "Soil Survey, Mesa County Area" (Reference 4, Exhibit 3.0) onsite soils are defined as (Bc), Billings silty clay loam, 0 to 2 percent slopes, hydrological soil group "C".

II. Existing Drainage Conditions

A. Major Basin:

Onsite and offsite lands drain generally from the northeast to the southwest towards the southwest corner of the site where it is conveyed westerly via an existing ditch towards Indian Wash (Exhibit 2.0). Runoff from areas east of the site is intercepted and convey south via an existing drainageway known as the Goodwill Drain.

Indian Wash is maintained by The City of Grand Junction. The Goodwill Drain is operated and maintained by The Grand Junction Drainage District.

There are no wetlands on the site. The site is nearly void of ground cover with the exception of isolated pockets of natural grasses.

The subject site is within Zone X as determined by the FIRM Flood Insurance Rate Map and is not within the 100 and 500 year flood plain of Indian Wash (Exhibit 1.0).

B. Site:

Approximately 100 percent of the onsite historic sub-basin drains from the northeast to the southwest in a sheetflow fashion towards an existing ditch along the south property line of the site. The flow within this ditch is conveyed west to Indian Wash.

The site is affected by offsite runoff from a small sub-basin northeast of site. Runoff from areas north of the site including K-Mart and Furr's is intercepted by parking lot grading elements and is directed west away from the site towards 28 Road. Topography of the property is flat in nature and slopes from the northeast to the southwest at approximately 0.75 percent.

III. Proposed Drainage Conditions

A. Changes in Drainage Patterns:

Historic offsite drainage patterns will be not altered. Runoff from offsite sub-basin OF1 will continue to be directed through the site via proposed roadways towards the southwest corner of the site. Runoff from areas east of the site shall continue to be intercepted by the Goodwill Drain.

The site is planned for a 83 single family manufactured home sites. Improvements to 28 1/4 Road shall include curb, gutter and sidewalk on the west side of the road and one lane of pavement. Improvements to the Goodwill Drain shall include the extension of the existing 18" CMP storm sewer under 28 1/4 Road with 18" RCP to the south end of the development.

There is 1 offsite tributary sub-basin OF1 (2.15 Ac.) which affects the subject property (Exhibit 2.0). Offsite drainage runoff from this sub-basin shall be directed towards the proposed storm sewer located at the southwest corner of the development and subsequently to Indian Wash.

All of the future onsite drainage will be directed by lot grading, swales and the proposed roadway system to a single low point in the southwest portion of the site where it is to be collected and conveyed by a proposed 30" RCP storm sewer directly to Indian Wash. The proposed site plan divides the site into 2 sub-basins labeled A1(5.28 Ac.) and B1(10.26 Ac.). Sub-basins A1 and B1 are to be graded to direct runoff to the proposed roadways and subsequently to the aforementioned storm sewer. A single combination inlet will be installed on the east side of the south end of West Niagara Circle to capture the runoff from Basin A-1 and a double combination inlet will be installed on the west side of the road to receive the remaining runoff from the development. All inlets and storm sewers have been designed to convey the 100 year developed flows. The developer will pay a fee in lieu of detention.

B. Maintenance Issues:

Access to and through the site shall be by a fully improved roadway section.

Ownership and responsibility for maintenance of the proposed storm sewer to Indian Wash shall be that of the City of Grand Junction. The storm sewer is to be located within a proposed dedicated easement along the south boundary line of the Colorado National Guard Property.

Ownership and responsibility for maintenance of the proposed storm sewer improvements to the Goodwill Drain shall be that of the Grand Junction Drainage District.

IV. Design Criteria & Approach

A. Hydrology:

The Soil Conservation Service's TR-55 method was used as the basis for analysis and facility design for determination of historic and developed flow rates for the 2 and 100 year storm events.

Due to the site's close proximity to Indian Wash, onsite detention requirements are considered mitigated. Developed runoff is to be discharged unabated to Indian Wash.

Runoff Coefficients to be used in the computations shall be based on Table 2-2a of the TR-55 manual and shown at the back of this report. The Soil Conservation Service defines site soils as being (Bc) Billings silty clay loam, 0 to 2 percent slopes (Reference 4, Exhibit 3.0). This soils falls within the Hydrologic Soil Group C .

The Intensity values (Ia) tabulated and shown in the back of this report have been used for design and analysis.

Times of Concentration shall be calculated based on the Average Velocities For Overland Flow and the Overland Flow Curves as provided.

B. Hydraulics:

All site facilities and conveyance elements are to be designed in accordance with the City of Grand Junction as provided in Reference 1.

V. Conclusions

Because the development of this project will result in the disturbance of more than five acres of land a "Construction Stormwater Discharge Permit" shall be required.

This Master Drainage Report has been prepared to address site-specific drainage concerns in accordance with the requirements of the City of Grand Junction, Colorado. The Appendix of this report includes criteria, exhibits, tables and calculations to be used in the design and analysis.

References

1. Stormwater Management Manual (SWMM), City of Grand Junction, Colorado, Department of Public Works, June 1994.

2. Urban Hydrology for Small Watersheds, Soil Conservation Service, Washington D.C. June, 1986.

3. Flood Insurance Rate Map, City Of Grand Junction, Colorado, Mesa County, Community Panel Number 080117 0007 E, Federal Emergency Management Agency, Map Revised July 15th, 1992.

4. Soil Survey, Mesa County Area, Colorado, , U.S. Department of Agriculture, issued November, 1955.

APPENDIX

HISTORIC BASIN MAP

EXHIBIT 2.0

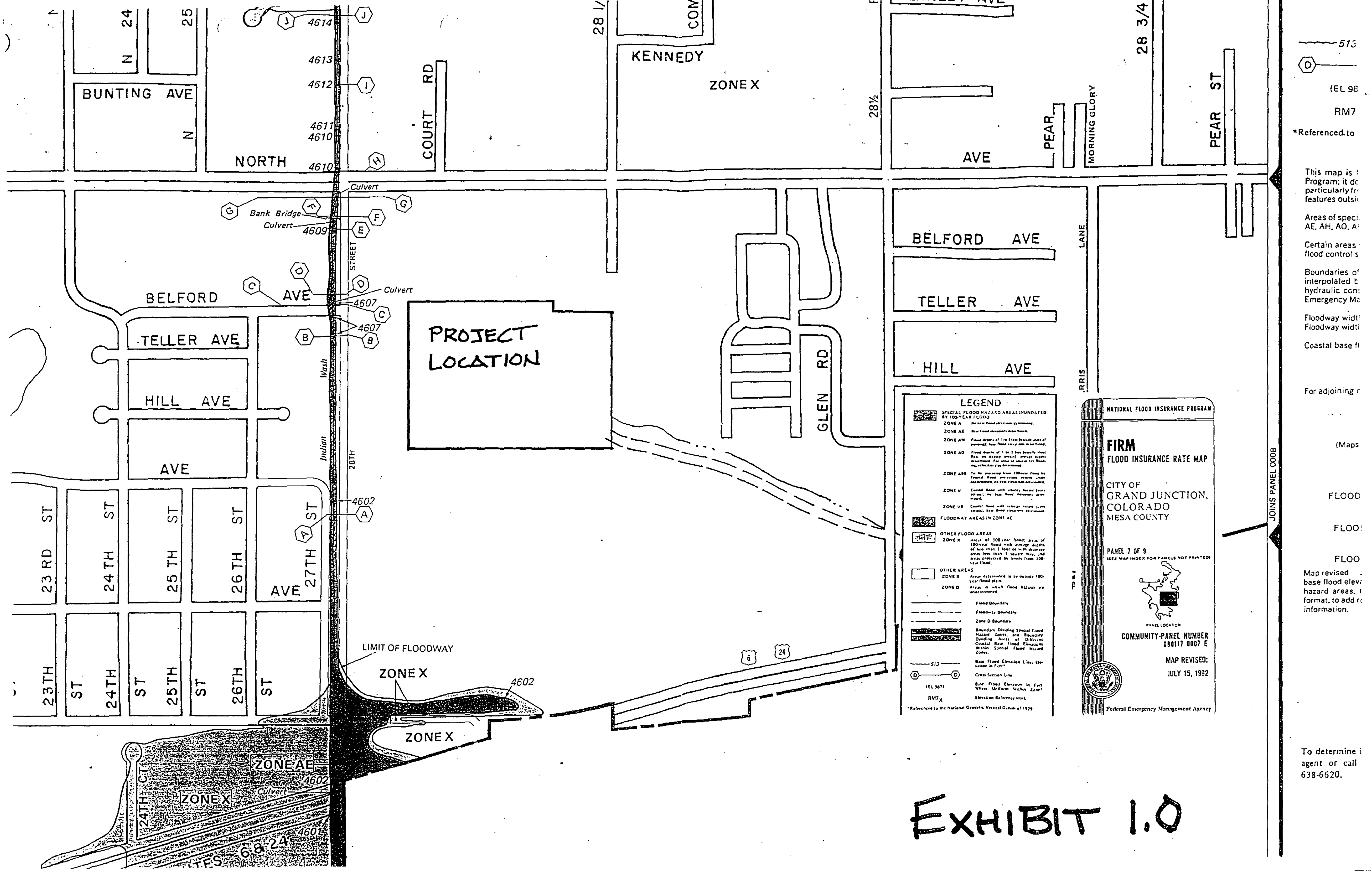
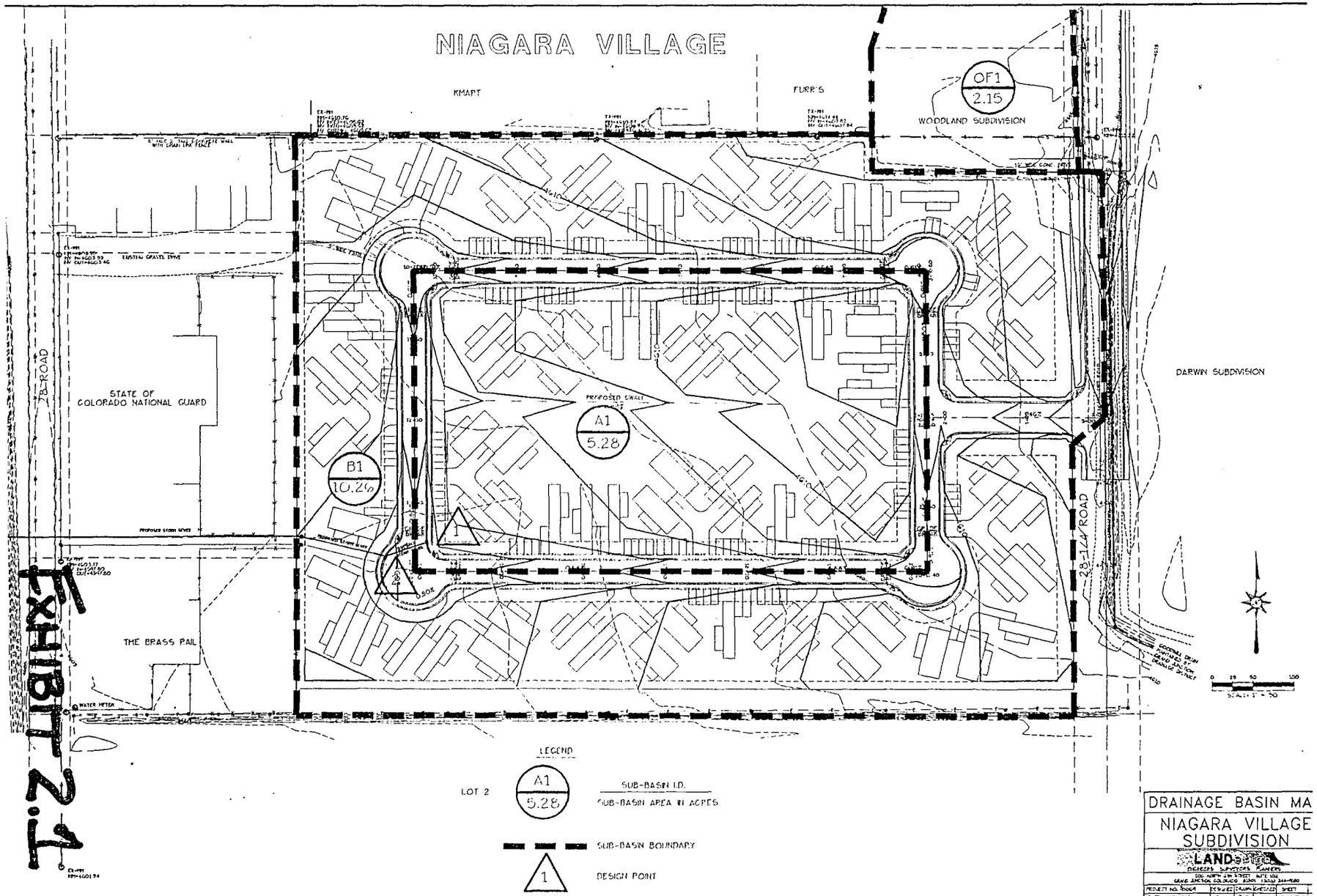
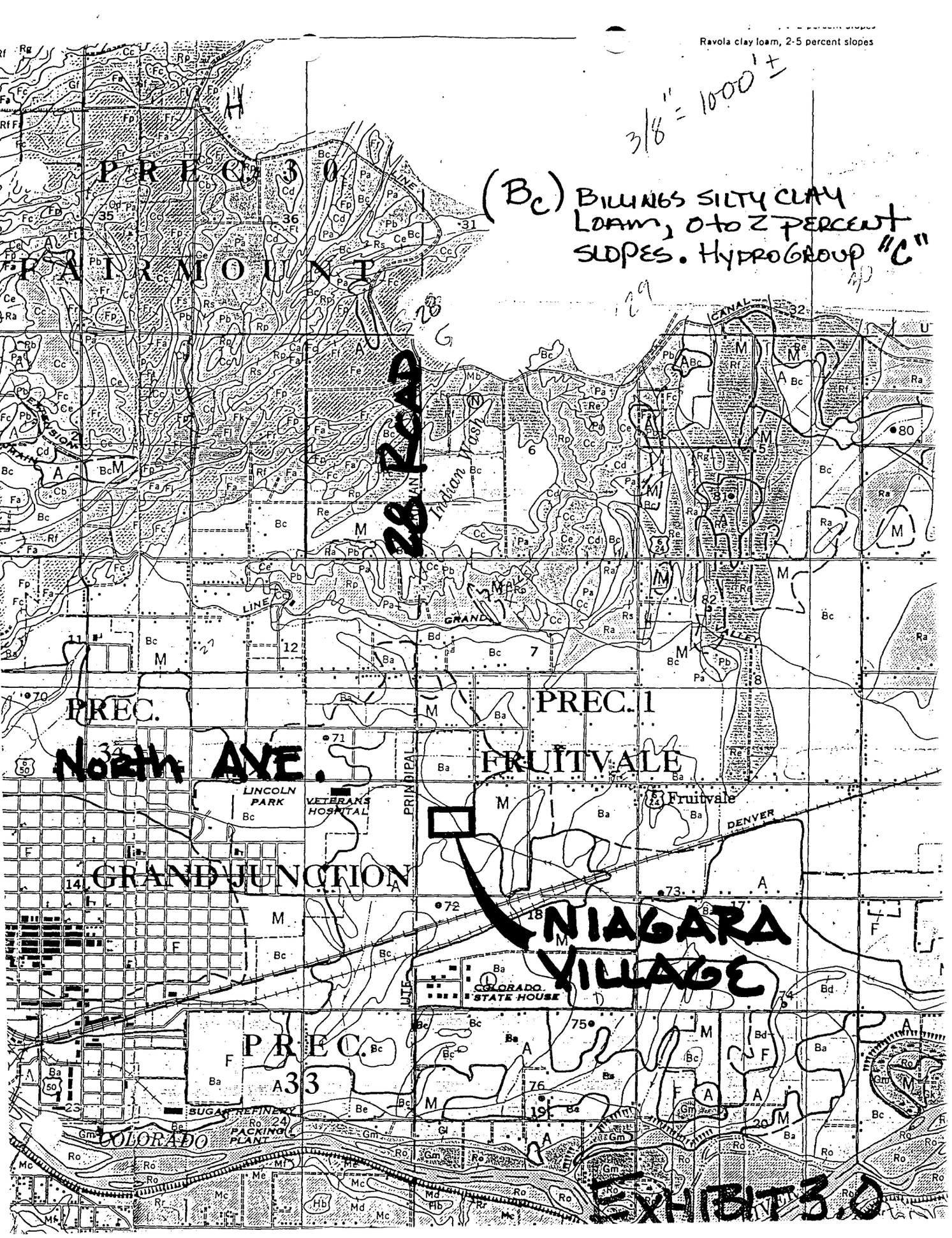

PROJECT LOCATION
BUNTING AVE
NORTH
AVE
BELFORD AVE
TELLER AVE
HILL AVE
KENNEDY
ZONE X
COURT RD
28TH STREET
Indian Wash
Culvert
Bank Bridge
LIMIT OF FLOODWAY
ZONE AE
23 RD ST
24 TH ST
25 TH ST
26 TH ST
27TH ST
GLEN RD
PEAR ST
MORNING GLORY
28 3/4
28½
JOINS PANEL 0008
LEGEND
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF
GRAND JUNCTION,
COLORADO
MESA COUNTY
PANEL 7 OF 9
COMMUNITY-PANEL NUMBER
080117 0007 E
MAP REVISED:
JULY 15, 1992
Federal Emergency Management Agency

EXHIBIT 1.0


NIAGARA VILLAGE
KMART
FURR'S
OF1
2.15
WOODLAND SUBDIVISION
DARWIN SUBDIVISION
STATE OF
COLORADO NATIONAL GUARD
THE BRASS RAIL
A1
5.28
B1
10.26
PROPOSED SWALE
28 ROAD
28 1/4 ROAD
EXHIBIT 2.1
LEGEND
LOT 2
A1
5.28
SUB-BASIN I.D.
SUB-BASIN AREA IN ACRES
SUB-BASIN BOUNDARY
1
DESIGN POINT
DRAINAGE BASIN MA
NIAGARA VILLAGE
SUBDIVISION
LAND TEC
DESIGN SURVEYORS PLANNERS


Ravola clay loam, 2-5 percent slopes
3/16" = 1000' ±
(Bc) BILLINGS SILTY CLAY LOAM, 0 to 2 PERCENT SLOPES. HYDROGROUP "C"
PREC. 30
FAIRMOUNT
PREC.
North AVE.
PREC. 1
FRUITVALE
Fruitvale
LINCOLN PARK
VETERANS HOSPITAL
PRINCIPAL
DENVER
GRAND JUNCTION
NIAGARA VILLAGE
COLORADO STATE HOUSE
PREC. A33
SUGAR REFINERY
PACKING PLANT
COLORADO
Indian Wash
CANAL
GRAND VALLEY
EXHIBIT 3.0

LAND USE OR SURFACE CHARACTERISTICS	SCS HYDROLOGIC SOIL GROUP (SEE APPENDIX "C" FOR DESCRIPTIONS)											
	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
UNDEVELOPED AREAS Bare ground	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .28 - .36	.30 - .38 .37 - .45	.20 - .28 .26 - .34	.28 - .36 .35 - .43	.36 - .44 .40 - .48	.24 - .32 .30 - .38	.30 - .38 .40 - .48	.40 - .48 .50 - .58
Cultivated/Agricultural	.08 - .18 .14 - .24	.13 - .23 .18 - .28	.16 - .26 .22 - .32	.11 - .19 .16 - .24	.15 - .23 .21 - .29	.21 - .29 .28 - .36	.14 - .22 .20 - .28	.19 - .27 .25 - .33	.26 - .34 .34 - .42	.18 - .26 .24 - .32	.23 - .31 .29 - .37	.31 - .39 .41 - .49
Pasture	.12 - .22 .15 - .25	.20 - .30 .25 - .35	.30 - .40 .37 - .47	.18 - .26 .23 - .31	.28 - .36 .34 - .42	.37 - .45 .45 - .53	.24 - .32 .30 - .38	.34 - .42 .42 - .50	.44 - .52 .52 - .60	.30 - .38 .37 - .45	.40 - .48 .50 - .58	.50 - .58 .62 - .70
Meadow	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .28 - .36	.30 - .38 .37 - .45	.20 - .28 .26 - .34	.28 - .36 .35 - .43	.36 - .44 .44 - .52	.24 - .32 .30 - .38	.30 - .38 .40 - .48	.40 - .48 .50 - .58
Forest	.05 - .15 .08 - .18	.08 - .18 .11 - .21	.11 - .21 .14 - .24	.08 - .16 .10 - .18	.11 - .19 .14 - .22	.14 - .22 .18 - .26	.10 - .18 .12 - .20	.13 - .21 .16 - .24	.16 - .24 .20 - .28	.12 - .20 .15 - .23	.16 - .24 .20 - .28	.20 - .28 .25 - .33
RESIDENTIAL AREAS 1/8 acre per unit	.40 - .50 .48 - .58	.43 - .53 .52 - .62	.46 - .56 .55 - .65	.42 - .50 .50 - .58	.45 - .53 .54 - .62	.50 - .58 .59 - .67	.45 - .53 .53 - .61	.48 - .56 .57 - .65	.53 - .61 .64 - .72	.48 - .56 .56 - .64	.51 - .59 .60 - .68	.57 - .65 .69 - .77
1/4 acre per unit	.27 - .37 .35 - .45	.31 - .41 .39 - .49	.34 - .44 .42 - .52	.29 - .37 .38 - .46	.34 - .42 .42 - .50	.38 - .46 .47 - .55	.32 - .40 .41 - .49	.36 - .44 .45 - .53	.41 - .49 .52 - .60	.35 - .43 .43 - .51	.39 - .47 .47 - .55	.45 - .53 .57 - .65
1/3 acre per unit	.22 - .32 .31 - .41	.26 - .36 .35 - .45	.29 - .39 .38 - .48	.25 - .33 .33 - .41	.29 - .37 .38 - .46	.33 - .41 .42 - .50	.28 - .36 .36 - .44	.32 - .40 .41 - .49	.37 - .45 .48 - .56	.31 - .39 .39 - .47	.35 - .43 .43 - .51	.42 - .50 .53 - .61
1/2 acre per unit	.16 - .26 .25 - .35	.20 - .30 .29 - .39	.24 - .34 .32 - .42	.19 - .27 .28 - .36	.23 - .31 .32 - .40	.28 - .36 .36 - .44	.22 - .30 .31 - .39	.27 - .35 .35 - .43	.32 - .40 .42 - .50	.26 - .34 .34 - .42	.30 - .38 .38 - .46	.37 - .45 .48 - .56
1 acre per unit	.14 - .24 .22 - .32	.19 - .29 .26 - .36	.22 - .32 .29 - .39	.17 - .25 .24 - .32	.21 - .29 .28 - .36	.26 - .34 .34 - .42	.20 - .28 .28 - .36	.25 - .33 .32 - .40	.31 - .39 .40 - .48	.24 - .32 .31 - .39	.29 - .37 .35 - .43	.35 - .43 .46 - .54
MISC. SURFACES Pavement and roofs	.93 .95	.94 .96	.95 .97	.93 .95	.94 .96	.95 .97	.93 .95	.94 .96	.95 .97	.93 .95	.94 .96	.95 .97
Traffic areas (soil and gravel)	.55 - .65 .65 - .70	.60 - .70 .70 - .75	.64 - .74 .74 - .79	.60 - .68 .68 - .76	.64 - .72 .72 - .80	.67 - .75 .75 - .83	.64 - .72 .72 - .80	.67 - .75 .75 - .83	.69 - .77 .77 - .85	.72 - .80 .79 - .87	.75 - .83 .82 - .90	.77 - .85 .84 - .92
Green landscaping (lawns, parks)	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .28 - .36	.30 - .38 .37 - .45	.20 - .28 .26 - .34	.28 - .36 .35 - .43	.36 - .44 .42 - .52	.24 - .32 .30 - .38	.30 - .38 .40 - .48	.40 - .48 .50 - .58
Non-green and gravel landscaping	.30 - .40 .34 - .44	.36 - .46 .42 - .52	.45 - .55 .50 - .60	.45 - .55 .50 - .60	.42 - .50 .48 - .56	.50 - .58 .57 - .65	.40 - .48 .46 - .54	.48 - .56 .55 - .63	.56 - .64 .64 - .72	.44 - .52 .50 - .58	.50 - .58 .60 - .68	.60 - .68 .70 - .78
Cemeteries, playgrounds	.20 - .30 .24 - .34	.26 - .36 .32 - .42	.35 - .45 .40 - .50	.35 - .45 .40 - .50	.32 - .40 .38 - .46	.40 - .48 .47 - .55	.30 - .38 .36 - .44	.38 - .44 .45 - .53	.46 - .54 .54 - .62	.34 - .42 .40 - .48	.40 - .48 .50 - .58	.50 - .58 .60 - .68

NOTES:
1. Values above and below pertain to the 2-year and 100-year storms, respectively.
2. The range of values provided allows for engineering judgement of site conditions such as basic shape, homogeneity of surface type, surface depression storage, and storm duration. In general, during shorter duration storms (Tc ≤ 10 minutes), infiltration capacity is higher, allowing use of a "C" value in the low range. Conversely, for longer duration storms (Tc) 30 minutes), use a ""C value in the higher range.
3. For residential development at less than 1/8 acre per unit or greater than 1 acre per unit, and also for commercial and industrial areas, use values under MISC SURFACES to estimate "C" value ranges for use.

RATIONAL METHOD RUNOFF COEFFICIENTS
(Modified from Table 4, UC-Davis, which appears to be a modification of work done by Rawls)

TABLE "B-1"

Table 2-2a.—Runoff curve numbers for urban areas[1]

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1]Average runoff condition, and $I_a = 0.2S$.
[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
[4]Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
[5]Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4, based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

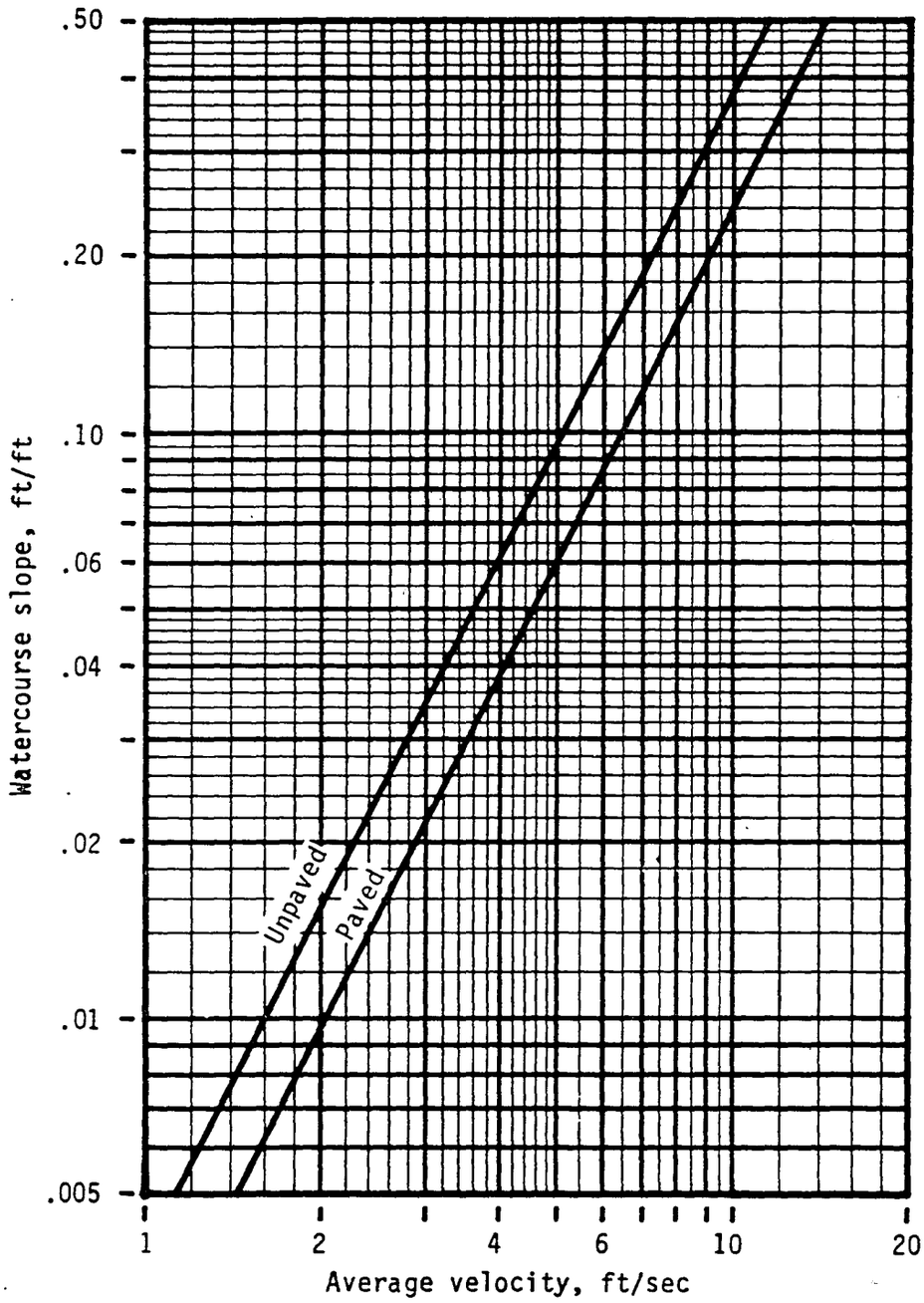


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

Exhibit 4-II: Unit peak discharge (q_u) for SCS type II rainfall distribution

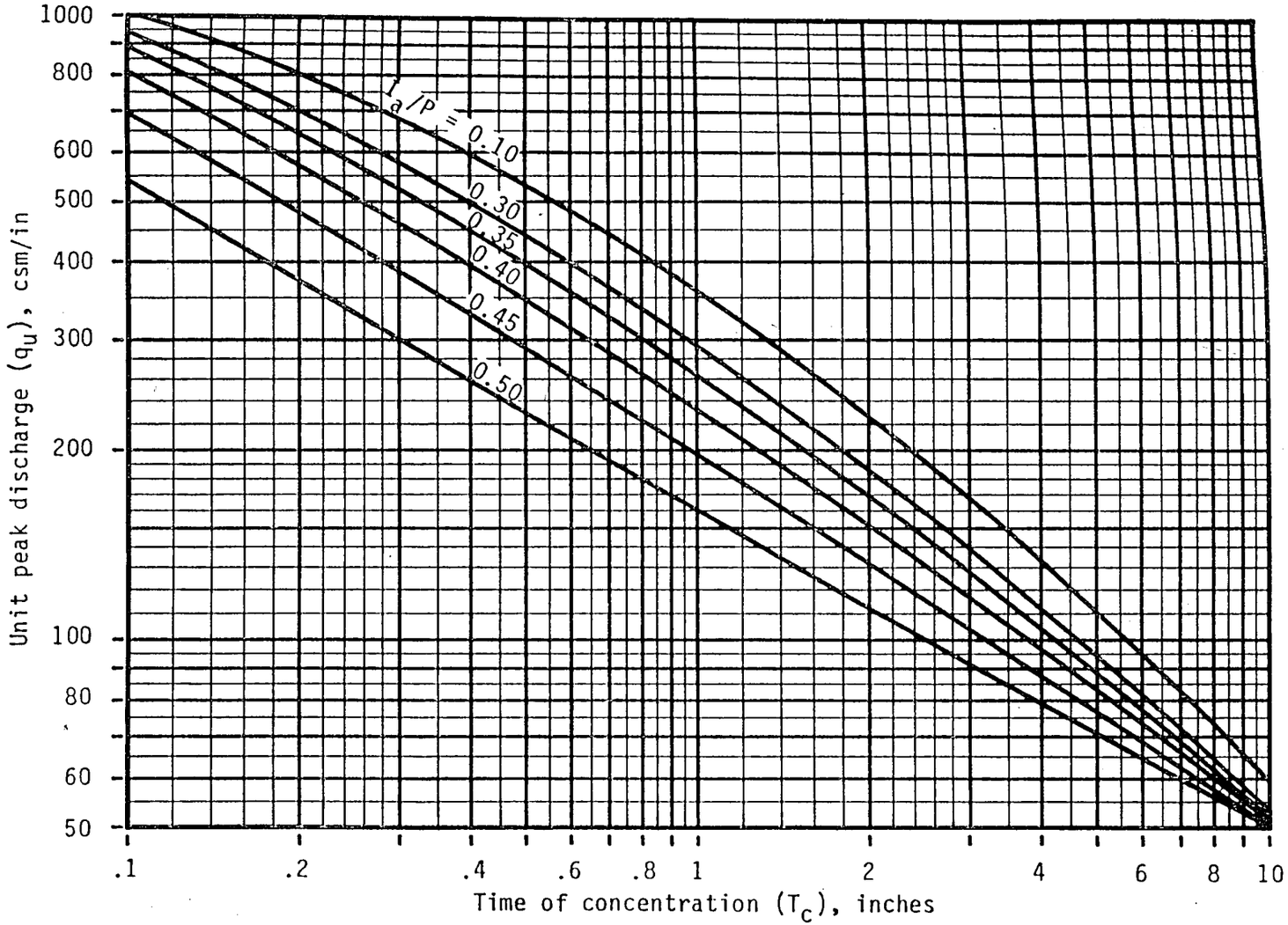


Table 4-1.—I_a values for runoff curve numbers

Curve number	I_a (in)	Curve number	I_a (in)
40	3.000	70	0.857
41	2.878	71	0.817
42	2.762	72	0.778
43	2.651	73	0.740
44	2.545	74	0.703
45	2.444	75	0.667
46	2.348	76	0.632
47	2.255	77	0.597
48	2.167	78	0.564
49	2.082	79	0.532
50	2.000	80	0.500
51	1.922	81	0.469
52	1.846	82	0.439
53	1.774	83	0.410
54	1.704	84	0.381
55	1.636	85	0.353
56	1.571	86	0.326
57	1.509	87	0.299
58	1.448	88	0.273
59	1.390	89	0.247
60	1.333	90	0.222
61	1.279	91	0.198
62	1.226	92	0.174
63	1.175	93	0.151
64	1.125	94	0.128
65	1.077	95	0.105
66	1.030	96	0.083
67	0.985	97	0.062
68	0.941	98	0.041
69	0.899		

STREET CARRYING CAPACITY (2 & 100 YEAR)

PROJECT: NIAGAGRA VILLAGE
LOCATION: CITY OF GRAND JUNCTION, COLORADO
DATE: Aug-95

Street Information:					
	R.O.W. Width =	44.00	FT.	Flow Area =	3.76 SF.
	Flowline Width =	31.00	FT.		
	Classification =	URBAN			
	Mannings =	0.015			
	Max. Depth =	0.42	FT.	Above Gutter Flowline	
	Str/ X-Slope =	1.00	%		
	Gutter Slope =	8.33	%	Drive Over Curb, Gutter and Walk	
	Sidewalk Slope =	2.08	%	1/4" / FT.	
	Roadside Slope =	2.08	%	1/4" / FT.	

SLOPE OF STREET %	REDUCTION FACTOR FOR SLOPE	ALLOWABLE CAPACITY C.F.S.	VELOCITY F.P.S.
0.50	1.00	9.72	2.59
0.58	1.00	10.47	2.79
0.91	1.00	13.12	3.49

Formula: $Qa = F \times (1.49/N) \times R^{2/3} \times S^{1/2} \times A$

F = Reduction Factor For Slope
N = Mannings Coefficient = 0.0150
R = Hydraulic Radius = A/WP = 0.2234
A = Cross Sectional Area Sq.Ft. = 3.760
WP = Wetted Perimeter Ft. = 16.83
S = Street Slope FT./FT.

Worksheet 2: Runoff curve number and runoff

Project NIAGARA VILLAGE By JR Date 8/28/95

Location 28 1/4 ROAD, SOUTH OF NORTH AV. Checked ____ Date ____

Circle one: (Present) Developed

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
BILLINGS	NATURAL DESERT LANDSCAPING	85			15.5	1317.5
BILLINGS	IMPERVIOUS AREA WOODLAND SUBDIVISION	98			2.2	215.6
				Totals =	17.7	1533.1

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1533.1}{17.7} = 86.6$; Use CN = 85

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	100	2	
Rainfall, P (24-hour) ..... in	2.01	1.40	
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	0.8	0.39	

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project NIAGARA VILLAGE By QC Date 8/28/95

Location 28¼ ROAD Checked ____ Date ____

Circle one: (Present) Developed

Circle one: (T_c) T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID			
1. Surface description (table 3-1)			FALLOW		
2. Manning's roughness coeff., n (table 3-1) ..			0.06		
3. Flow length, L (total L ≤ 300 ft)	ft		300		
4. Two-yr 24-hr rainfall, P_2	in		1.4		
5. Land slope, s	ft/ft		.01		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr		.38	+	= .38
Shallow concentrated flow		Segment ID			
7. Surface description (paved or unpaved)			UNPAVED		
8. Flow length, L	ft		915		
9. Watercourse slope, s	ft/ft		.01		
10. Average velocity, V (figure 3-1)	ft/s		1.6		
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		.16	+	= .16
Channel flow		Segment ID			
12. Cross sectional flow area, a	ft^2				
13. Wetted perimeter, p_w	ft				
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft				
15. Channel slope, s	ft/ft				
16. Manning's roughness coeff., n					
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s				
18. Flow length, L	ft				
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr			+	=
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr				.54

Worksheet 4: Graphical Peak Discharge method

Project NIAGARA VILLAGE By JPC Date 8/28/95

Location 28¼ ROAD Checked ____ Date ____

Circle one: (Present) Developed

1. Data:

   Drainage area ..... A_m = .028 mi^2 (acres/640)

   Runoff curve number .... CN = 85 (From worksheet 2)

   Time of concentration .. T_c = .54 hr (From worksheet 3)

   Rainfall distribution type = II (I, IA, II, III)

   Pond and swamp areas spread throughout watershed ..... = 0 percent of A_m (____ acres or mi^2 covered)

			Storm #1	Storm #2	Storm #3
2.	Frequency	yr	100	2	
3.	Rainfall, P (24-hour)	in	2.01	1.4	
4.	Initial abstraction, I_a ..... (Use CN with table 4-1.)	in	.353	.353	
5.	Compute I_a/P		.176	.252	
6.	Unit peak discharge, q_u ..... (Use T_c and I_a/P with exhibit 4-II)	csm/in	480	450	
7.	Runoff, Q ..... (From worksheet 2).	in	.8	.39	
8.	Pond and swamp adjustment factor, F_p .... (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond and swamp area.)		1	1	
9.	Peak discharge, q_p ..... (Where $q_p = q_u A_m Q F_p$)	cfs	11	5	

Worksheet 2: Runoff curve number and runoff

Project NIAGARA VILLAGE By glc Date 8/28/95

Location 28 1/4 ROAD, SOUTH OF NORTH AV. Checked ____ Date ____

Circle one: Present (Developed) _____

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
BILLINGS	RESIDENTIAL DISTRICT 1/8 AC. OR LESS	90			17.7	1593
1/ Use only one CN source per line.				Totals =	17.7	1593

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = ____ = _____; Use CN = 90

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	100	2	
Rainfall, P (24-hour) ..... in	2.01	1.40	
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	1.09	0.61	

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project NIAGARA VILLAGE By JPC Date 8/28/95

Location 28 1/4 ROAD Checked ____ Date ____

Circle one: Present (Developed)

Circle one: (T_c) T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID	WOODLAND SUBD.			
1. Surface description (table 3-1)			SMOOTH			
2. Manning's roughness coeff., n (table 3-1)			.011			
3. Flow length, L (total L ≤ 300 ft)	ft		260			
4. Two-yr 24-hr rainfall, P_2	in		1.4			
5. Land slope, s	ft/ft		.01			
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$ Compute T_t	hr		.09	+		= .09
Shallow concentrated flow		Segment ID				
7. Surface description (paved or unpaved)			UNPAVED			
8. Flow length, L	ft		100			
9. Watercourse slope, s	ft/ft		.01			
10. Average velocity, V (figure 3-1)	ft/s		1.6			
11. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr		.017	+		= .017
Channel flow		Segment ID				
12. Cross sectional flow area, a	ft^2		3.76			
13. Wetted perimeter, p_w	ft		16.83			
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft		0.223			
15. Channel slope, s	ft/ft		.0058			
16. Manning's roughness coeff., n			.015			
17. $V = \frac{1.49\, r^{2/3}\, s^{1/2}}{n}$ Compute V	ft/s		2.79			
18. Flow length, L	ft		970			
19. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr		.097	+		= .097
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr					.204

Worksheet 4: Graphical Peak Discharge method

Project NIAGARA VILLAGE By JAC Date 8/28/95

Location 28¼ ROAD Checked ____ Date ____

Circle one: Present (Developed) _____

1. Data:

   Drainage area ..... A_m = 0.028 mi^2 (acres/640)

   Runoff curve number .... CN = 90 (From worksheet 2)

   Time of concentration .. T_c = .204 hr (From worksheet 3)

   Rainfall distribution type = II (I, IA, II, III)

   Pond and swamp areas spread throughout watershed ..... = 0 percent of A_m (____ acres or mi^2 covered)

		Storm #1	Storm #2	Storm #3
2. Frequency	yr	100	2	
3. Rainfall, P (24-hour)	in	2.01	1.4	
4. Initial abstraction, I_a ..... (Use CN with table 4-1.)	in	.222	.222	
5. Compute I_a/P		.11	.16	
6. Unit peak discharge, q_u ..... (Use T_c and I_a/P with exhibit 4-II)	csm/in	800	750	
7. Runoff, Q ..... (From worksheet 2).	in	1.09	.61	
8. Pond and swamp adjustment factor, F_p .... (Use percent pond and swamp area with table 4-2. Factor is 1.0 for zero percent pond and swamp area.)		1	1	
9. Peak discharge, q_p ..... (Where $q_p = q_u A_m Q F_p$)	cfs	24	13	

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: INLET 1 TO INLET 2

Comment: INLET 1 TO INLET 2

Solve For Full Flow Capacity

Given Input Data:

Diameter.....	1.00	ft
Slope.....	0.0407	ft/ft
Manning's n.....	0.015	
Discharge.....	6.23	cfs

12"Ø
4.07%
RCP
< 7.16 CFS Q100 C (1)
0.93CFS SPILLS OVER TO INLET # 2

Computed Results:

Full Flow Capacity.....	6.23	cfs
Full Flow Depth.....	1.00	ft
Velocity.....	7.93	fps
Flow Area.....	0.79	sf
Critical Depth....	0.96	ft
Critical Slope....	0.0355	ft/ft
Percent Full.....	100.00	%
Full Capacity.....	6.23	cfs
QMAX @.94D.....	6.70	cfs
Froude Number.....	FULL	

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: INLET 2 TO OUTLET

Comment: INLET 2 TO OUTLET AT INDIAN WASH

Solve For Full Flow Slope

Given Input Data:

Diameter.....	2.50 ft	30" ∅
Manning's n.....	0.015	RCP
Discharge.....	24.00 cfs	Q_{100}

Computed Results:

Full Flow Channel Slope	0.0046 ft/ft	0.46% MIN ALLOWABLE SLOPE
Full Flow Depth.....	2.50 ft	
Velocity.....	4.89 fps	
Flow Area.....	4.91 sf	
Critical Depth....	1.67 ft	
Critical Slope....	0.0074 ft/ft	
Percent Full.....	100.00 %	
Full Capacity.....	24.00 cfs	
QMAX @.94D.....	25.82 cfs	> Q_{100} OK
Froude Number.....	FULL	

ROAD TYPE	COMBINATION INLET CAPACITY (CFS)					
	SINGLE		DOUBLE		TRIPLE	
	2-YR	100-YR	2-YR	100-YR	2-YR	100-YR
Urban Residential (local)	6.4	13	9.5	22	12.7	31
Residential Collector, Commercial and Industrial Streets	3.2	13	4.9	22	6.5	31
Collector Streets (3000 - 8000 ADT)	2.7	13	4.0	22	5.3	31
Principal and Minor Arterials	6.0	13	9.0	22	12.0	31

Inlet capacities shown above are based upon: 1) use of non-curved vane grates (similar to HEC-12 P-1⅞-4 grates; 2) HEC-12 procedures; 3) clogging factors per Section VI; and 4) City/County standard inlets with 2-inch radius on curb face and type C grates. Capacities shown for 2-year storms are based upon depths allowed by maximum street inundation per Figure "G-3". The 100-year capacities are based upon a ponded depth of 1.0 foot. Note that only combination inlets are allowed in sag or sump conditions.

MAXIMUM INLET CAPACITIES: SUMP OR SAG CONDITION — TABLE "G-1"

Q_{100} TO INLET #1 = 7.16 CFS — 13 CFS ALLOWED

Q_{100} TO INLET #2 = 16.84 CFS — 22 CFS ALLOWED

TOTAL 24 CFS

INLET #1 USE SINGLE

INLET #2 USE DOUBLE

SEWER SYSTEM DESIGN REPORT

FOR

NIAGARA VILLAGE FILING 1

September 1, 1995

Prepared for:
Waterloo Nevada Corporation

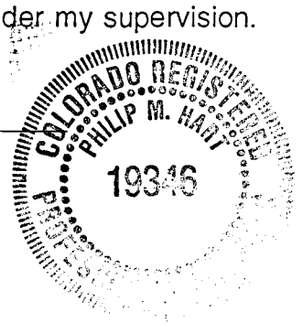
Prepared by:
LANDesign
200 North 6th St.
Suite 102
Grand Junction, Colorado 81501

Prepared by: Charles M. Best

Charles Mike Best

I certify that this study has been prepared by me or under my supervision.

Philip M. Hart P.E.
State of Colorado, #19346



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Information Supplied by Falcon Supply Company, Inc.

Pump Curve

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Easement for access to the Lift Station

Plan and Profile Sheets For the Sanitary Sewer Lift Station and Force Mains

A. INTRODUCTION

This report involves the design of a lift station for a sewer system located in Niagra Village. The area and the population which will be served by the system will be discussed in this report, including the average daily flows and the peak hourly flows. The design flow range will be examined, including the minimum daily flow and the future conditions expected for the system. The pump and lift station designs will be outlined and discussed in relation to the standards the design needs to meet. The appropriate pump type, well dimensions, desired number of pumps, both emergency and operational flow, number of pump cycles under operational conditions, overall size of the well and the effects of buoyancy on the well will all be topics discussed in regard to the design of the system. The discharge line flow velocities and head loss rates for the required pipe size will be provided for the range of flows. The selection of an appropriate pump model will be discussed and the final pump selection will then be reviewed and the horsepower, operational range, impeller size, controls and power source will be outlined.

The sanitary sewer system for Niagara Village including the lift station will be constructed and financed by the Waterloo Nevada Corporation. When construction is complete the Fruitvale Sanitation District will acquire the sewer system including the lift station. The Fruitvale Sanitation District will then own operate and sell sewer taps in Niagara Village. Waterloo Nevada Corporation will be responsible for a one year warranty for the system. For example if the system fails then Waterloo Nevada will be responsible for the repair of the system for one year. The Fruitvale Sanitation District will not sell any sewer taps for this system until the system is accepted and in operation by the Fruitvale Sanitation District.

Waterloo Nevada Corporation will finance the sewer system including the lift station costing approximately $30,000.00 from the sales of the lots in this development.

Waterloo Niagara Corporation has granted an easement to the Fruitvale Sanitation District for the repair and maintenance of the system. A copy of this easement and a copy of the improvements agreement are provided in the appendix of this report.

The Fruitvale Sanitation District will approve this sewer system and lift station design for construction June 1995.

B. SEWAGE SERVICE AND GENERATION

The sewer system involves 83 lots and will accommodate single family homes. The area is rated for a density of 3 people per home, giving a service needed for 249 people. Using 105 gpcd for the average daily flow, Niagra Village service will encompass 26,145 gallons per day. The peak hour estimates for the system are calculated by using 400 gpcd. The peak hourly flow will be 4150 gallons per hour.

C. SANITARY SEWAGE LIFT STATION

1. Design Flow Range

The minimum daily flow is defined as one-third of the average daily flow and is etermined to be 8715 gallons per day. This flow is the minimum flow that the lift tation will be required to handle.

2. Wet Well and Lift Station Pump Design

After consulting with James H. Martinsen of Falcon Supply, he has determined that a pump manufactured by Smith and Loveless, from Lenexa, Kansas model number 4B2B would meet the criteria. Please refer to the information included in the Appendix regarding the data sheets provided by Mr. Martinsen for the wet well mounted pump station.

The lift station will have two pumps and each pump should be designed for a capacity of at least 100% of the peak hourly flow. Each pump in the lift station has a capacity of delivering 100 gpm. The pumps are impeller type and are rated at 1.5 horsepower each. The pumps have internal opening that will pass a 3 inch sphere. The suction and force main are 4 inch PVC pipe. The lift station has a separate suction line for each of the two pumps. There will be one gate valve and one check valve provided on the 4 inch force main. The 4 inch suction lines will be provided with 4 inch check valves. The lift station will be controlled using mercury float switches.

Public Service Company of Colorado will provide the electrical power for the lift station. Pubic Service of Colorado was contacted and they have determined that the average electrical outage for the Feeder is minimal. The electrical wiring will be a single phase 240 volt supply. The voltage will then be converted to 240 volt three phase power using an ARCO Roto-Phase Converter. The lift station will also be provided with run time meters for the pumps. The electrical service and wiring will comply with all the requirements of the current National Electrical Code.

The lift station will be connected to a telephone line sending remote telemetering to the Mesa County Sewage Treatment Facility for 24-hour monitoring. The Fruitvale Sanitation District was contacted and our office was informed that if the lift station electrical power is interrupted, an alarm will sound at the treatment facility and a maintenance truck will be dispatched to repair the lift station or connect the lift station to a portable electrical generator. There is also a pump truck that can be dispatched that will pump out the wet well if electrical service can not be restored to the lift station. This service is 24 hours a day 365 days of the year.

Using a volume created by the minimum daily flow for a cycle of 30 minutes and the inside dimensions of the pump, the operational volume for the pump was found to be 181.56 gallons. This would give the pump a running time of approximately1.82 minutes, with the two available pumps alternating each cycle.

The size of the well is as follows; depth is 14 feet inside and the inside of the wet well will be 6 feet in diameter with fillets as shown on the Sewer Lift Station Plan. The emergency volume is 1245 gallons and operating volume is calculated as 181.56. The emergency volume for the wet well was found to be 1245 gallons, which was determined by calculating the inside dimensions of the wet well up to a surface level meeting the bottom of the manway. The lag volume at the bottom of the well was calculated as 43 gallons.

There was no ground water table encountered near the lift station, therefore effects of buoyancy on the well will not be discussed.

As shown on the Site Map in the appendix of this report the lift station is located in zone X of the FIRM Flood Maps.

3. Force Mains

The velocity for an 4 inch pipe with a pump rating of 100 gpm was determined to be 2.56 fps.

The length of pipe to consider head loss is 350 feet. The elevation difference from the lift station to the manhole receiving the flow is 6.5 feet. The head loss in the pipe due to friction is estimated as 2.84 feet and the velocity head loss is considered to be negligible. This gives the total dynamic head to be approximately 10 feet. The pumps specified by Falcon Supply will provide the required100 gpm at the total head of 10 feet.

D. Conclusions

The sewage lift station required for the subdivision will meet the needs of this subdivision residents.

Details and Calculations

Project: NIAGARA VILLAGE BRL
Date: 9/1/95

LIFT STATION

CALCULATIONS

- (83 UNITS)(3 PERSONS PER LOT) = 249 PEOPLE
- AVERAGE DAILY FLOW = (249)(105 gpcd) = 26,145 GAL/DAY
- MINIMUM DAILY FLOW

  1/3 (26145) = 8715 GAL/DAY

- EMERGENCY HOURLY FLOW

  (249 PEOPLE)(400 gpcd) = 99,600 GAL/DAY = 4,150 GAL/HR

- 30 MINUTE CYCLE VOLUME

  VOLUME = (8715 GAL/DAY)(DAY/24 HR) = 363.13 GAL/HR

  30 MINUTE CYCLE: 363.13/2 = 181.57 GAL/30 MIN

  = 24.27 FT^3/30 MIN

- D (DEPTH FROM TOP OF LAG VOLUME TO TOP OF 30 MIN VOLUME — NEED 24.27 FT^3 VOLUME

  AVERAGE DIAMETER ON BOTTOM

  (1.75+5)/2 = 3.375'

  AVERAGE AREA = $\pi(3.375)^2/4$ = 8.95

Details and Calculations

Project: NIAGARA VILLAGE ~~BP1~~ Page: 2
Date: 9/1/95

APPROXIMATE AREA ON BOTTOM = $8.95 ft^2$.

USE D=2.5' FOR 30 MINUTE VOLUME

EMERGENCY VOLUME

VOLUME 1:

BOTTOM AREA = $8.95 ft^2$
TOP AREA = $\pi (5')^2/4 = 19.63 ft^2$

AVERAGE AREA = $14.29 ft^2$

VOL. 1 = $(375)(14.29 ft^2) = 400.9$ GAL

VOLUME 2:

$(5.75)(19.63 ft^2) = 844.3$ GAL $\quad \Sigma = 1245$ GALLONS.

LAG VOLUME

AVERAGE BOTTOM DIAM. = $1+3.5/2 = 2.25$ AREA = $\frac{\pi(2.25)^2}{4} = 3.97 ft^2$

AVERAGE TOP DIAM = $\frac{1.75}{2}+5 = 3.375$ AREA = $\frac{\pi(3.375)^2}{4} = 8.95 ft^2$

AVERAGE AREA $(3.97+8.95)/2 = 6.46 ft^2$

LAG VOL = (0.875' HEIGHT)$(6.46 ft^2) = 42.25$ GALLONS.

Details and Calculations

Project: NIAGARA VILLAGE BRJ
Date: 9/1/95

VELOCITY

$$100\,gpm \times \frac{0.133\,ft^3}{1\,GAL} \times \frac{1\,min}{60\,sec} = 0.223\,cfs$$

$Q = VA \quad A = \pi(4/12)^2/4 = 0.0873\,ft^2$

$V = Q/A = 0.223\,cfs / 0.0873\,ft^2 = 2.56\,fps$

HEAD LOSS

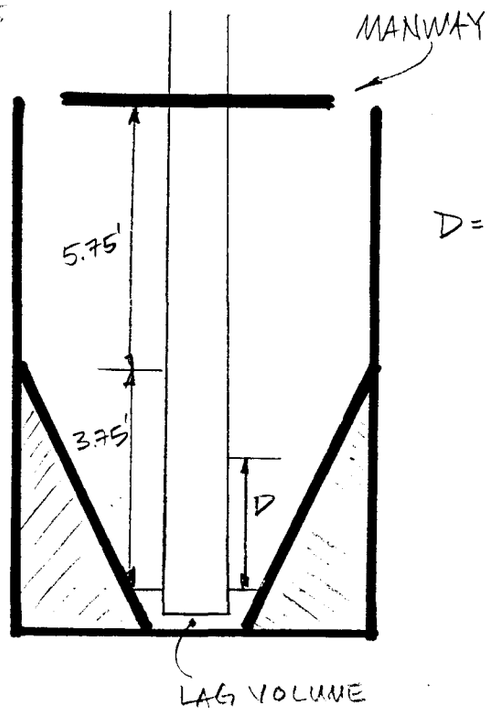
ELEV. DIFF 6.5'

350' @ 4" PVC = 2.84'

$\Sigma = 9.3 \sim 10'$

Details and Calculations

Project: NIAGARA VILLAGE "BP1"
Date: 9/1/95



EMERGENCY VOLUME

= 1245 GAL.

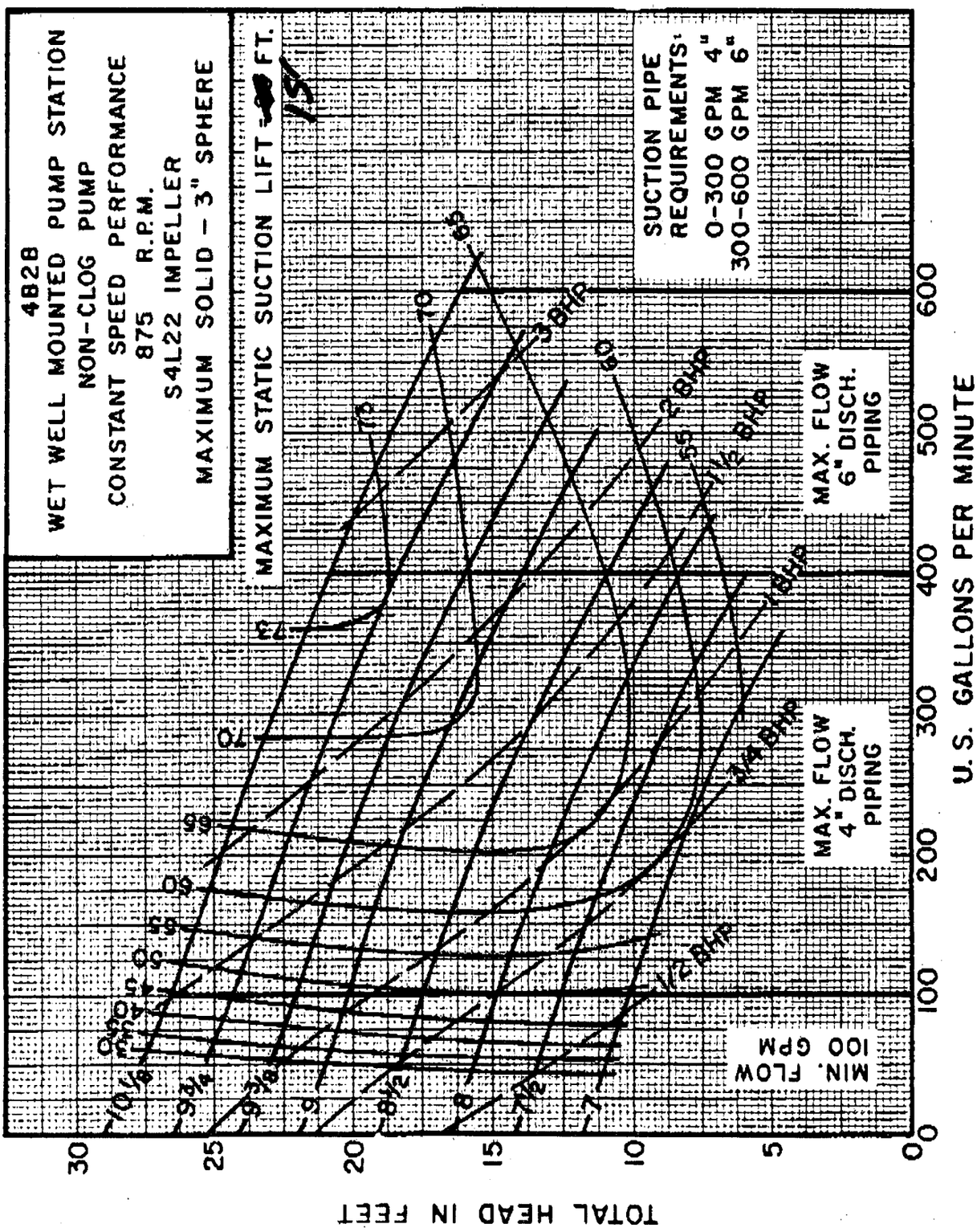
D = 2.5' (DEPTH OF OPERATIONAL VOLUME, MEASURED FROM LAG VOLUME SURFACE.

ENGINEERING DATA

Smith & Loveless, Inc.

14040 W. Santa Fe Trail Dr.
Lenexa, Kansas 66215

Vacuum Primed
Pump Performance Curves
Constant Speed
4B2B
875 RPM



November 2, 1995

City of Grand Junction
Community Development Department
250 North 5th. Street
Grand Junction, Colorado 81501

Attn: Mr. Michael Drollinger.

Re: **Niagara Village Filing No. One, 28 1/4 Road Improvements, File #FPP-95-156.**

Dear Mr. Drollinger;

As requested by your office and the developer we have calculated the cost for the improvements of 28 1/4 Road for it's entire length adjacent to the development.

The cost for improvements is based on actual bid prices for roadway construction within the project. Our opinion of probable cost is $40,221.04 (calculation sheet attached). The developer is requesting this amount be applied to the Traffic Capacity Payment as previously agreed to by your office and the developer.

Please contact our office if you have any questions or concerns regarding this response.

Sincerely

Monty D. Stroup
Project Manager

cc: Jody Kliska

200 NORTH 6TH ST. • GRAND JUNCTION, CO 81501 • FAX (970) 245-3076 • (970) 245-4099

NIAGARA VILLAGE FILING NO. 1
28 1/4 ROAD FROM NIAGARA CIRCLE SOUTH
STREET IMPROVEMENTS 02-Nov-95

ITEM	DESCRIPTION	UNIT	QUAN	UNIT PRICE	TOTAL
1	Remove Clear & Grub	LS	1	$670.00	$670.00
2	Import Pit Run for Street Section To Sub-grade 0-2 Ft Deep Varies w/ Loc.	TONS	1,353	$3.70	$5,006.10
3	Import Fill Material (dirt)	TONS	282	$2.95	$831.90
4	Sub-Grade Preperation	SY	2,316	$0.72	$1,667.52
5	Class 6 ABC Under Curbs & Walkway	TONS	134	$10.60	$1,420.40
6	5" Grading C HBP	TONS	501	$26.45	$13,251.45
7	24-Inch Curb & Gutter	LF	535	$7.62	$4,076.70
8	5-Foot Detached Sidewalk	SF	2,675	$2.05	$5,483.75
9	Gravel Shoulder	LS	1	$700.00	$700.00
10	8" Fillets	SF	420	$3.78	$1,587.60
11	8" Cross Pans	SF	216	$3.47	$749.52
12	Handicap Ramp	SF	489	$2.90	$1,418.10
13	Post Delineators (9 Each)	LS	1	$133.00	$133.00
14	Realign Waste Ditch	LS	1	$1,075.00	$1,075.00
15	Adjust Water Valves	EA	1	$130.00	$130.00
16	Road Barricade	EA	1	$1,350.00	$1,350.00
17	Compliance Testing	LS	1	$670.00	$670.00
	TOTAL STREET IMPROVEMENTS				$40,221.04

WestWater Engineering
Consulting Engineers

2516 FORESIGHT CIRCLE, #1 GRAND JUNCTION, COLORADO 81505 (970) 241-7076 FAX (970) 241-7097

November 6, 1995

Monty Stroup
LANDesign
200 N. 6th Street, Suite 102
Grand Junction, Colorado 81501

SUBJECT: Niagara Village Filing No. One - Review Comments for Submittal #3

Dear Monty,

We have reviewed your recent submittal for construction of the above referenced project. The submittal was received in three parts including 1) a copy of the signed easement deed and agreement between the Brass Rail and the Niagara Village Homeowners Association submitted by Mr. Livingston on November 2nd, 2) the Fruitvale Sanitation District Sewer Line Extension Application and Agreement, a proposed construction schedule, a revised plat and the majority of the design drawings that were hand delivered on November 2nd, and 3) revised sheet ST-3 showing the barricade detail which was hand delivered November 3rd. Our comments are summarized below and are numbered in the same manner as our second review letter dated November 1.

1a. The Extension Application and the Agreement is incomplete and is being returned for completion. Specific information that is missing is as follows: 1) page 1 - common location of property, description of proposed sanitary sewer extension and estimated total cost, and 2) page 3 - date, owner, address, phone number, representative, subdivision, location, contractor and total extension contract price. In addition, we did not receive the required deposit fee of $300 for review of the sewer line extension, but believe this may be because the flow chart and explanation of engineering review and associated costs may have been missing in your package. Since we are close to approval, the deposit will be waived. A copy of the flow chart is enclosed for your reference through completion of the project. The final review fee will be invoiced once a set of plans that can be approved is received.

1b. It is understood that this comment remains in effect.

1c. It is understood that this comment remains in effect.

2a. A revised easement and agreement between the Homeowners and the District was not received. The sewer that is referred to in Section Two of the easement is to be clarified as a "sanitary" sewer, similar to the reference to "storm" sewer. Also, if the signed easement between the Brass Rail and the Homeowners Association has not been recorded, it too should be modified to identify the sewer as a sanitary sewer in Section Two, per our original comments dated October 10, 1995.

2b. It is understood that this comment remains in effect.

2c. The District is willing to waive the requirement that no fences shall be constructed across the easement of the Brass Rail property, however, the language shall allow the District to remove any fence or other obstruction that may be placed in the 20 foot easement in the event the District needs to access the sewer line. Should the District need to remove the fence, it would be reinstalled by the District.

2d. It is understood that this comment remains in effect.

2e. It is understood that this comment remains in effect.

3a. The design modification is accepted.

3b. Removable rails on the barricade on North Niagara Circle are acceptable, however, the note refers to posts being installed at 10' spacing. The detail should be clarified per our telephone conversation on November 2nd, in which you indicated that the center post has been deleted and the space between the two interior posts is 20' to allow a vehicle to drive between the posts when rails are removed.

4a. The correction has been made.

4b. Requirements for construction of the gravel road has been noted.

4c. Requirements for construction of the berm road has been noted.

5a. Correction has been made.

5b. Notes have been added.

5c. The profile on sheet SW-2 has not been clarified to identify which grade line is existing and which is the finished grade. Notes should be added similar to the notes on sheet SW-1.

5d. It is understood that this comment remain in effect.

5e. It is understood that this comment remains in effect.

5f. It is understood that this comment remains in effect.

5g. Clarify the notes on the plan and profile of the 40 foot stub out for the B line sewer at MH-A3. Install a glued end cap and mark the location with a 2x4 post

painted green. The terminology "glue and plug" that is on the drawings is not acceptable. It is understood that the stub out will be subject to all testing required of new sewer lines.

5h. Note 10 of the standard sewer notes is still incorrect. The note is to be corrected to read as follows:

> The Contractor is responsible for all required sewer line testing to be completed in the presence of the District Engineer or their representative. Final testing is to be accomplished only after all other infrastructure has been installed. This includes waterlines, gas lines, electric lines, etc. Testing will be performed after all compaction of street subgrade and prior to street paving. Final lamping will also be accomplished after paving is completed to insure that the line is clean. These tests will be the basis for issuing Initial Acceptance of the sewer line.

5h. The match line has not been added.

5j. The notes have been added.

5k. The approval block has been corrected.

5l. The vertical scale has been added.

5m. It is understood that this comment remains in effect.

5n. No further comment.

5o. The description of MH-A1 has not been corrected to include the invert elevation for the existing 10" inlet pipe. MH-A1 has one 10" inlet from the north, one 8" inlet from the west and one 10" outlet to the south.

5p. Note 4 of the general notes is to refer to existing sanitary sewer lines and manholes. Reference only to manholes does not apply to the project because the design has the new pipe connecting to the existing sewer line, and not to an existing manhole.

5q. Corrections have been made.

5r. Corrections have been made.

5s. It is understood that this comment remains in effect.

Once the above comments are addressed, please submit at least 5 sets of stamped drawings for approval along with the other documents requested herein. We will retain 2 copies, one for our files and one for the District, and return the remaining sets to your office. I will be out of the office from Wednesday the 8th through the following Tuesday. If you have any questions or need assistance during this period, please contact Steve LaBonde.

Respectfully,

C. Kellie Knowles, P.E.

cc: Art Crawford, District Manager
Michael Drollinger, City of Grand Junction
Sidney Spivak, President

LANDesign
PLANNING • ENGINEERING • SURVEYING

November 9, 1995

Mr. Richard Livingston
Golden, Mumby, Summers & LIvingston
Norwest Bank Building, Suite 400
2808 North Avenue
Grand Junction, CO 81502

Re: Niagara Village Subdivision

Dear Rich,

This letter is to inform you as to the payment arrangement of our design fees with Mr. Sidney Spivak on the above mentioned project. It is my understanding that the $12,216.95 will be paid as follows:

- $6,000.00 immediately ← PAID $6,000.00 IN full Nov. 9th, 1995 M Stroup
- $6,216.95 on December 1st

If this arrangement meets with your understanding, I feel that the $12,216.95 can be removed from the Developments Improvement Agreement between Waterloo and the City of Grand Junction.

If there are any questions regarding this matter, please contact me.

Sincerely,

Philip M. Hart, PE
President

200 NORTH 6TH ST. • GRAND JUNCTION, CO 81501 • FAX (970) 245-3076 • (970) 245-4099

FILE

Grand Junction Community Development Department
Planning • Zoning • Code Enforcement
250 North Fifth Street
Grand Junction, Colorado 81501-2668
(970) 244-1430 FAX (970) 244-1599

November 27, 1995

Richard Livingston
Golden, Mumby, Summers, Livingston & Kane
P.O. Box 398
Grand Junction CO 81502

Re: Niagara Village (Our File #FPP-95-156)

Dear Mr. Livingston,

This is a follow-up to your letter to Dan Wilson dated November 17th. As per our conversation please find enclosed copies of the Development Improvements Agreement and Security Agreement for the above project. Also, I have enclosed the original of "page 2" of the Disbursement Agreement with a minor correction to the text suggested by Dan. If this correction meets your approval, please initial it and return the original to my attention.

Please do not hesitate to contact either Dan or myself should you have any questions.

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: Dan Wilson, City Attorney

Encls.

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City's benefit. Escrow Agent warrants: that the funds are to be held in trust solely to secure Developer's obligations under the Improvements Agreement; that the Escrow Agent shall act as agent of the City in holding the funds; that the Funds will not be paid out or disbursed to or on behalf of the Developer except as set forth in this document or as set forth in the Improvements Agreement; and that the Escrow Agent may not modify or revoke its obligation to disburse funds to or on behalf of the Developer except as set forth in this document or as set forth in the Improvements Agreement; and that the Escrow Agent may not modify or revoke its obligation to disburse funds to or on behalf of the Developer or the City. The Escrow Agent warrants that the funds are and will be available exclusively for payment of the costs of satisfactory completion of the improvements.

2. Disbursement Procedures. Funds shall be advanced for payment of costs incurred for the construction of Improvements on the Property in accordance with the Improvements List/Detail, attached hereto as Exhibit "A". All disbursements must comply with the following procedures:

a. Request for Advance. Developer shall deliver to the Escrow Agent a written request for the disbursement of funds on forms acceptable to the City. Such requests shall be signed by Developer, Developer's Project Engineer and, ~~if applicable,~~ the City Engineer and shall certify: that all costs for which the advance is being requested have been incurred in connection with the construction of the improvements on the Property; that all work performed and materials supplied are in accordance with the plans and specifications submitted to and approved by the City; that the work has been performed in a workmanlike manner; that no funds are being requested for work not completed, nor for material not installed; that the Project Engineer has inspected the improvements for which payment is requested; and that such improvements have been completed in accordance with all terms, specifications and conditions of the approved plans. The City Engineer shall respond to all disbursement requests within three (3) working days or such requests shall be deemed approved.

Attached hereto as Attachment "A" is the list of those individuals, and their respective signatures, required to sign the above described requests.

b. Documentation, Waivers and Checks. Each request for disbursement of funds shall be accompanied by: (i) one original and one copy of each invoice to be paid; (ii) lien waivers in a form approved by the Escrow Agent prepared for signature by each payee; and (iii) postage paid envelopes addressed to each payee for the mailing of checks. The Escrow Agent shall verify its receipt of all lien waivers relating to any prior disbursements, which lien waivers shall be properly executed and contain no alterations or

FPP-95-15

FILE

LANDesign

ENGINEERING • SURVEYING • PLANNING

January 26, 1996

City of Grand Junction
Engineering Division
Department of Public Works
250 N. 5th Street
Grand Junction, CO 81501

Attn: Mr. Trent Prall

Re: Niagara Village Filing No. 1, Job #95069

Dear Trent;

This letter is to inform you that the proposed 8-inch waterline from the Niagara project to the 28 Road connection has been installed. Chlorination and flushing of the line was accomplished today. The line is to be pressure tested on Monday, January 29, 1996.

In keeping with the conversation between our office, Jody Kliska and yourself we respectfully request that the hold on building permits be removed effective Tuesday, January 30th, 1996.

Sincerely

Monty D. Stroup

cc: M. Drollinger

OK as per Trent P

259 Grand Ave. • GRAND JUNCTION, CO 81501 • (970) 245-4099 • FAX (970) 245-3076

FPP-95-156

SIDNEY J. SPIVAK, Q.C.
202-808 Wellington Ave., Winnipeg, Manitoba
Mailing Address: Box 98, Sta. L, Winnipeg, Manitoba, Canada R3H 0Z4
Telephone: (204) 772-8665
Facsimile: (204) 772-8679

March 12, 1996

VIA FAX

RECEIVED GRAND JUNCTION
PLANNING DEPARTMENT
MAR 12 1996

Mr. Michael Drollinger
Planning Department
City of Grand Junction

Dear Sir:

Re: Niagara Village - Waterloo Nevada Limited

I have just been informed that John Davis has informed the City Inspectors that permission was given to trespass and to commence work on his project on our property.

At no time was John Davis given permission. He was told to contact Richard Livingston.

I understand now that he is interefrring with our people who are installing the pavement.

Would you please contact Richard Livingston at 242-7322.

Yours truly,

WATERLOO NEVADA LIMITED

per: Sidney J. Spivak

xc R. Livingston

TCP CREDIT - NIAGARA VILLAGE

Credit for 28 1/4 Road improvements:	$40,221.04
Filing #1 TCP (27 units X$500/unit)	13,500.00
Net **Filing #1** TCP after credits	0.00
Credit remaining for future filings:	$26,721.04

APPROVED:

Jody Kliska, City Development Engineer — Date: 11-17-95

h:\mdforms\tcpcred.wpd

FPP-1995-1-6

June 20, 1996

Irving Nacht
Waterloo Nevada LTD
P.O. Box 98 Station L
Winnipeg, Manitoba Canada R3HO

City of Grand Junction, Colorado
250 North Fifth Street
81501-2668
FAX: (970)244-1599

Subject: Niagara Village Filing 1 Subdivision

Dear Mr. Nacht:

A final inspection of the streets and drainage facilities in Niagara Village Filing 1 Subdivision was conducted on May 2, 1996. As a result of this inspection, a list of remaining items was given to Monty Stroup of Landesign for completion. These items were reinspected and found to be satisfactorily completed.

"As Built" record drawings and required test results for the streets and drainage facilities were received on April 23, 1996. These have been reviewed and found to be acceptable.

In light of the above, the streets and drainage improvements are eligible to be accepted for future maintenance by the City of Grand Junction one year after the date of substantial completion. The date of substantial completion is May 2, 1996.

Your warranty obligation for all materials and workmanship for a period of one year beginning with the date of substantial completion will expire upon acceptance by the City.
If you are required to replace or correct any defects which are apparent during the period of the warranty, a new acceptance date and extended warranty period will be established by the City.

Thank you for your cooperation in the completion of the work on this project.

Sincerely,

Jody Kliska
City Development Engineer

cc: Don Newton
Doug Cline
Walt Hoyt
Kathy Portner
Landesign