Table of Contents

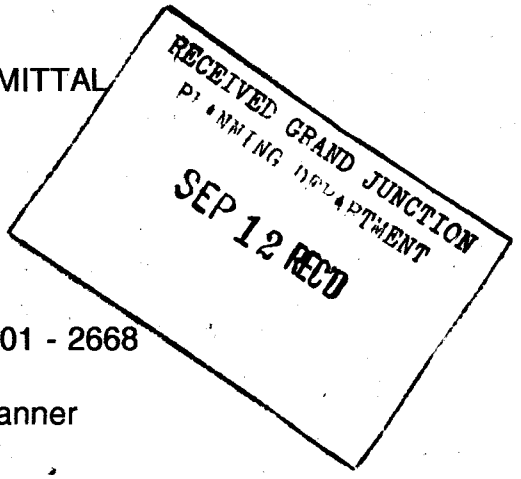
File SPR-1996-080 Name: Orchard Lodge – E. of 28 1/4 Rd btw. Patterson /Orchard Ave .-Site Plan Review

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

DOCUMENT DESCRIPTION:

X	X	Drainage Report – 3/96	X		Hydrology Map
X	X	Correspondence	X		Storm Drain Details
X		Easement Deed and Agreement – Bk 2207 / Pg 446-not conveyed to City	X		Miscellaneous Standard Details
X		Warranty Deed – Bk 2100 / Pg 58 – not conveyed to City	X		Accessible Ramp and Parking Stall Details
X	X	Traffic Impact Study – 10/16/95	X		Sanitary Sewer Details
X	X	Engineers Opinion of Cost – 3/21/96	X		Layout and Fine Grading Plan
X		E-mails – (a few are scanned)	X		Construction Details
X	X	Preliminary Estimate – 6/4/96	X		Construction Specifications
X	X	Geotechnical Investigation	X		Irrigation Plan
X		Composite Utility and Storm Sewer Plan	X		Irrigation Details
X	X	Site, Grading and Drainage Plan – to be scanned (2 pages)	X		Irrigation Specifications
X	X	Sanitary Sewer Plan and Profile	X		Landscape Plan – Tree and Vine Planting
X		Planting Specifications	X		Shrub and Groundcover Planting
X		Site Lighting Plan	X		Planting Details

THE OFFICE OF WILLIAM RABBEN
LANDSCAPEARCHITECTUREURBANDESIGNPLANNING



TRANSMITTAL

Date: September 8, 1995

To: City planning Department
City of Grand Junction
250 North 5th Street
Grand Junction, Colorado 81501 - 2668

Attn: Mr. Michael Drollinger, City Planner

From: William Rabben

Ref: Preliminary Landscape Plan Submittal
Orchard Lodge Congregate Living Facility

Dear Michael,

Attached is one colored original of the Preliminary Landscape Plan at 1" = 20' - 0" that I promised to send to you during our telephone conversation in August.

Based on your review and approval of this Preliminary Submittal, we will proceed with final Construction Documents to be submitted to you in conjunction with issuance of the occupancy permit for this project.

I would be glad to meet with you to discuss any questions you may have regarding this plan, at your convenience.

I will call you next week just to make sure that you received the plan.

Sincerely,

William Rabben, Principal
ASLA

cc: Ms. Jilie Gilbert, Mr. Noel Hart

23 CHICKADEE ALISO VIEJO CALIFORNIA 92656 TEL•FAX 714 470 0230

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

October 3, 1995

William Rabin
23 Chickadee
Aliso Viejo CA 92656

RE: Preliminary Landscape Plan
Orchard Lodge Congregate Living Facility

Dear Mr. Rabin,

This is a follow-up to your September 8, 1995 letter and accompanying preliminary landscape plan. I have done a preliminary review of the plan and found that it appears to conform with the landscaping requirements of the City. In fact, many areas contain more landscaping than is required by Code. A formal review of the landscape plan will be done in conjunction with the site plan review for the project.

If you have any questions or require further information please do not hesitate to contact me.

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: Orchard Lodge File

h:\cityfil\1995\orchard1.wpd

LONCO, INC.

CONSULTING ENGINEERS since 1962 *CIVIL • STRUCTURAL • TRANSPORTATION*

Principals
WILLIAM E. HAMOUZ, P.E.
RANDALL E. DeLANCEY, P.E.

Associate Principals
J. P. ILLES, P.E.
JESSIE B. FITZGERALD, P.E.
MARK A. HAMOUZ, P.E.

October 16, 1995

Ms. Jody Kliska, PE
City of Grand Junction
250 North 5th Street
Grand Junction, Colorado 81501

RE: Orchard Lodge Elderly Housing Center Traffic Impact Study
Orchard Avenue & 28 1/4 Road
FILE: 9501.15

Dear Ms. Kliska:

On behalf of the applicant, LONCO Consulting Engineers, Inc. has analyzed potential traffic impacts that are expected to result from the construction of the above-referenced project. That project will be a 89,560 SF retirement center comprised of 112 apartment-like dwelling units to be located along the west side of 28 1/4 Road just north of the 28 1/4 Road/Orchard Avenue intersection in Grand Junction. This project will have one access located approximately 380 feet north of the 28 1/4 Road/Orchard Avenue intersection, which will align with Pinyon Court.

Trip Generation & Traffic Congestion

An estimate of the traffic that will be generated by this development was calculated by using trip generation rates outlined in ***Trip Generation***, 5th Edition, Institute of Transportation Engineers (ITE), 1991. The land-use that best matches this project is "Elderly Housing - Attached". ***Trip Generation*** defines that land-use as follows:

"Elderly housing (attached) - restricted to senior citizens - contain residential units similar to apartments and condominiums, and are sometimes self-contained villages. They may also contain special services such as medical facilities, dining facilities, and some limited supporting retail facilities."

Table 1 summarizes the trip generation expected to result from this project.

TABLE 1 - TRIP GENERATION
ELDERLY HOUSING - ATTACHED

LAND-USE	PARAMETER	SIZE	AM PEAK ENTER (vph)	AM PEAK EXIT (vph)	AM PEAK TOTAL (vph)	PM PEAK ENTER (vph)	PM PEAK EXIT (vph)	PM PEAK TOTAL (vph)
ELDERLY HOUSING - ATTACHED (LAND-USE CODE 253)	DWELLING UNIT	112	3	3	6	6	3	9

Rates contained within ***Trip Generation*** are based on studies performed at similar land-use locations throughout the country. For the above land-use, ***Trip Generation*** lists a total of four studies used to develop trip generation rates. ***Trip Generation*** recognizes limitations in estimating traffic based on a low number of studies, such as four studies for this land-use.

Trip Generation contains another land-use, Retirement Community, that is described as follows:

"Retirement communities - restricted to adults or senior citizens - contain residential units similar to apartments or condominiums, and are usually self-contained villages. They may also contain special services such as medical facilities, dining facilities, and some limited supporting retail facilities."

Based on our understanding of the project, the description of the "Elderly Housing - Attached" more accurately classifies the proposed Orchard Lodge than the description for "Retirement Community". However, since the number of studies used to develop trip generation rates for Elderly Housing - Attached is low, a comparison is offered with the Retirement Community land-use:

TABLE 2 - TRIP GENERATION
RETIREMENT COMMUNITY

LAND-USE	PARAMETER	SIZE	AM PEAK ENTER (vph)	AM PEAK EXIT (vph)	AM PEAK TOTAL (vph)	PM PEAK ENTER (vph)	PM PEAK EXIT (vph)	PM PEAK TOTAL (vph)
RETIREMENT COMMUNITY	DWELLING UNIT	112	9	10	19	20	16	36

Table 2 indicates a PM Peak Total trip generation of 36 vehicles per hour based on the Retirement Community land-use. This compares with 9 vehicles per hour based on the Elderly Housing - Attached land-use. In either case, the amount of traffic generated by this project during

the PM Peak Hour is relatively low. Therefore, it is anticipated that no adverse traffic congestion impacts will result from the construction of this project. Should you have any questions regarding this analysis, please contact me.

Very truly yours,

Brendan J. Kelly, PE

cc: Noel Hart

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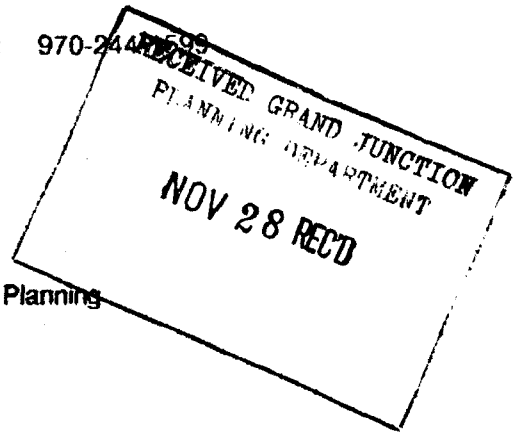
Date: November 25, 1995 FAX: 970-244-1599



To: Mr. Michael Drollinger
Grand Junction City Planning Department
250 North Street
Grand Junction, Colorado 81501-2668

From: William Rabben
OWR Landscape Architecture Urban Design Planning
23 Chickadee
Aliso Viejo, Ca. 92656

Project: Orchard Lodge, Grand Junction, Colorado

The following are some of the questions and information (that I said I would send you last week) that we will need to complete our Landscape and Irrigation documents for the above mentioned project:

1. What is the water source and quality of water? Irrigation
domestic, reclaimed or well water, etc.

2. Static pressure or phone number of water department? Trent P.

contact Ute re: water service permission to serve

3. Winterization requirements, if any.
   a. Frost line depth
   b. Any area standards, depth of footings, landscape walls, fences, trellis elements etc?

4. Any restrictions for separate water meter for landscape? Millie
Costs: 1-1/2" vs. 2"

$2050 1½"
$4150 2"

5. Water use calculations and/or irrigation scheduling requirements as part of landscape documents.

6. A.D.A. standards and uniform building code U.B.C. reference year for this project, for specifications.

7. Irrigation criteria for Gardens
   a. Quantity of hose bibbs required
   b. Drip irrigation - Use of considering climate and seasonal variations?

8. Landscape standards state 30" x42" max. sheet size for drawings. We would like to use one base sheet at 30" x 42" with a match line and reorientation of a small portion of the plan near the canal so that all of our work area can be included on one sheet. Is this acceptable?

9. Will the documents we prepare in California be acceptable if the Landscape Architect preparing them is not licensed in Colorado?

I will call you on Tuesday to discuss these questions in more detail. Thanks again Michael

Best Regards Bill R.

Bill R

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JESSIE B. FITZGERALD, P.E.
MARK A. HAMOUZ, P.E.

January 23, 1996

Ms. Jody Kliska, PE
City of Grand Junction
250 North 5th Street
Grand Junction, Colorado 81501

RE: Orchard Lodge Elderly Housing Center Traffic Impact Study
Orchard Avenue & 28 1/4 Road
FILE: 9501.15

Dear Ms. Kliska:

As you requested yesterday by telephone, LONCO has reviewed the City of Grand Junction's Volume Warrants for Left-turn Deceleration Lanes as it pertains to the above-referenced project.

Our letter/report to you dated October 16, 1995 estimates the peak entering traffic for this project to be 6 vehicles per hour occurring during the PM peak hour. A review of a September 28, 1995 City traffic count at the 28 1/4 Road and Elm Street intersection indicates an approximate 50% northbound/southbound directional split of traffic along 28 1/4 Road during the PM peak hour. Therefore, of the total 6 vehicles expected to enter the project during the peak hour, 3 vehicles will be executing left-turns.

The City's enclosed warrants show that a left-turn deceleration lane is not required for left-turn entering volumes equal to or less than 12 vehicles per hour. Since it is anticipated that this project will create a peak left-turn entering volume of 3 vehicles per hour, a left-turn deceleration lane is not warranted for this project.

Should you have any questions regarding the above, please contact me.

Very truly yours,

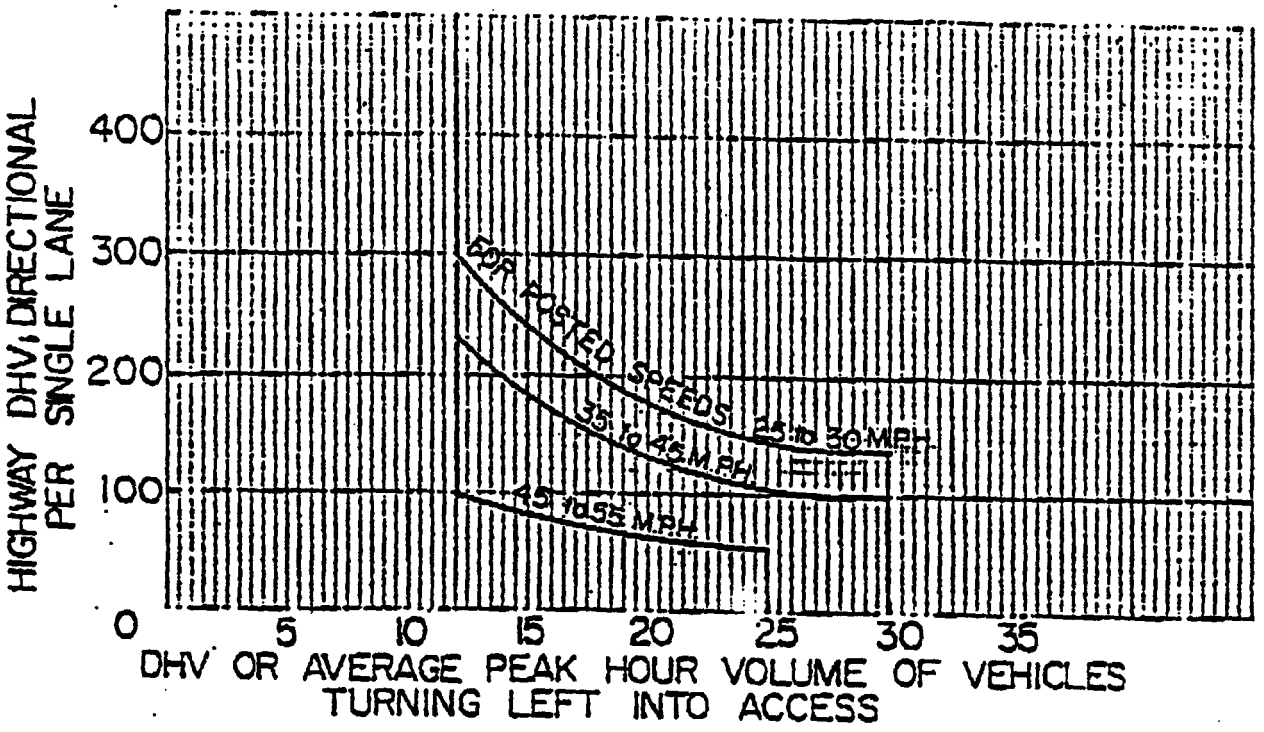
Brendan J. Kelly, PE

Enclosure

cc: Noel Hart

d:\ldata\a\9501.15\let1.doc

LAWRENCE STREET CENTER • 1380 LAWRENCE STREET, SUITE 1100 • DENVER, COLORADO 80204 • 303/620-0098 • FAX 303/620-9397



STATE HIGHWAYS AND CITY STREETS

CITY OF GRAND JUNCTION
DEPARTMENT OF PUBLIC WORKS

VOLUME WARRANTS FOR LEFT-TURN DECELERATION LANES

FIGURE 5

TABLE 1 - TRIP GENERATION
ELDERLY HOUSING - ATTACHED

LAND-USE	PARAMETER	SIZE	AM PEAK ENTER (vph)	AM PEAK EXIT (vph)	AM PEAK TOTAL (vph)	PM PEAK ENTER (vph)	PM PEAK EXIT (vph)	PM PEAK TOTAL (vph)
ELDERLY HOUSING - ATTACHED (LAND-USE CODE 253)	DWELLING UNIT	112	3	3	6	6	3	9

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Based on our understanding of the project, the description of the "Elderly Housing - Attached" more accurately classifies the proposed Orchard Lodge than the description for "Retirement Community". However, since the number of studies used to develop trip generation rates for Elderly Housing - Attached is low, a comparison is offered with the Retirement Community land-use:

TABLE 2 - TRIP GENERATION
RETIREMENT COMMUNITY

LAND-USE	PARAMETER	SIZE	AM PEAK ENTER (vph)	AM PEAK EXIT (vph)	AM PEAK TOTAL (vph)	PM PEAK ENTER (vph)	PM PEAK EXIT (vph)	PM PEAK TOTAL (vph)
RETIREMENT COMMUNITY	DWELLING UNIT	112	9	10	19	20	16	36

Table 2 indicates a PM Peak Total trip generation of 36 vehicles per hour based on the Retirement Community land-use. This compares with 9 vehicles per hour based on the Elderly Housing - Attached land-use. In either case, the amount of traffic generated by this project during

Drainage Report

28 1/4 Road Senior Housing

March 1996

Prepared for:

Terra Properties
11999 San Vicente Blvd.
Lox Angeles, CA 92705
Ph. (714) 835-7178

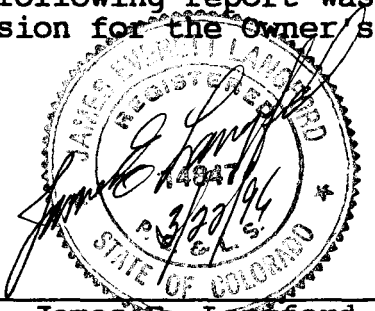
Prepared by:

THOMPSON-LANGFORD CORPORATION
529 251/2 RD., SUITE B-210
Grand Junction, CO 81505
PH. 243-6067

Job. No 0249-001.03

Engineer's Certification

I hereby certify that the following report was prepared by me or under my direct supervision for the Owner's hereof.



James E. Langford, PE & LS
Reg. No. 14847

. Site and Major Basin Description

1. Acreage: Original Plat 7.05 acres
   Tributary to Canal 1.09 acres
   Devel. below Canal 5.96 acres

2. Ground cover types:
   The site is presently covered with wheat grasses, weeds and a few scattered small Elm trees.

3. Hydrologic soil types:
   Billings Silty Clay Loam, locally called adobe. The soil is derived from deep alluvial deposits that came mainly from Mancos shale. The hydrologic soil group is "C"

Existing Drainage Conditions

The upper 1.09 acres of the site sheds directly to the Grand Valley Canal. There are no current plans to do anything with this area.

The lower 5.96 acres is the subject of this report. Historically, the area has drained to the southwest eventually collecting in a nearly obliterated wastewater ditch which eventually fed a 15-inch CMP running beneath Orchard Avenue and into Indian Wash.

There are no off-site areas tributary to this site.

Proposed Drainage Conditions

The upper 1/3 of the 5.96 acres scheduled for development slopes at between 2% and 9% to the south. Though some grading will take place to create more maintainable slopes, there are no plans for either hardscape or buildings in this area.

Overland sheet flows from the upper 1/3 of the developed area will be collected in area inlets and enter the underground conduit system designed to service the lower area.

The lower 2/3 of the area below the canal slopes at between 1% and 2% towards the southwest corner of the site. The area has been divided into 10 sub-basins, as shown on the Site Plan, delineated primarily by the canal to the north, 28

1/4 Rd. improvements, a perimeter barrier wall on the west and south sides and the building roof lines. The area will be developed as shown on the Site Plan with a system of underground conduits and shallow roadside swales, directing the developed condition flows in the historic direction to a detention facility located in the southwest corner of the property.

Design Criteria & Approach

The site was analyzed using the Modified Rational Method as detailed in the City of Grand Junctions Storm Water Management Manual (SWMM). The various coefficients and the intensities were also taken from exhibits found in this manual. The calculation procedures for determination of the detention pond size and for design of the two stage outlet structure were as outlined in Appendix "N" of the SWMM.

Results and Conclusions

All site drainage will be collected via grassed swales, curb and gutter, and an underground collection system and delivered to a detention facility stretching across the south line of the property.

The 2-year and 100-year flows were calculated for design purposes. The results were as follows:

Q2(historic) = 1.36 cfs

Q2(developed) = 6.50 cfs

Q100 (historic) = 4.54 cfs

Q100 (developed) = 17.63 cfs

The detention facility was designed to hold up to the 100-year developed condition event and discharge at the historic rates for the 2 and 100 year events. The storage volume was calculated in accordance with the criteria outlined in the City of Grand Junction's Storm Water Management Manual (SWMM) with the following results:

V2 = 18,568.67 cu-ft or 0.4263 Ac-Ft

V100 = 31,974.79 cu-ft or 0.7340 Ac-Ft

A two stage outlet control structure was designed per City criteria as found in the SWMM with the following results:

2-year orifice diameter = 0.50′ or 6″. The orifice is to be located in the side of the standpipe with the invert even with the bottom of the retention facility at elevation 4624.0.

100-year wier width = 0.50′ or 6″. The wier is to be located near the top of the standpipe with the crest at the 2-year storage elevation of 4626.70. The depth of flow over the wier will be equal to the difference between the 100 and 2 year storage elevations, or 1.25′.

The calculation sheets supporting the above results are attached to this report.

TABLE - 4a

RUNOFF VOLUME **(2-year)**

For: 28 1/4 SENIOR HOUSING

USING

RATIONAL METHOD Q=CxCfxIxA

BASIN	Q Volume cfs	C Composite Coefficient n/a	Cf Antecedent Precip. Fac. n/a	I* Rainfall Intensity in/hr	A Basin Area acres
	(Based on 300' of overland flow and 600' of shallow channel flow				
Historic flow=	**1.36**	0.30	1	0.76	5.95
Devel. flow =	**6.50**				
Basin-A	0.26	0.30	1	1.95	0.44
Basin-B	1.02	0.66	1	1.95	0.79
Basin-C	0.91	0.72	1	1.95	0.65
Basin-D	0.43	0.30	1	1.95	0.74
Basin-E	0.58	0.73	1	1.95	0.41
Basin-F	0.52	0.58	1	1.95	0.46
Basin-G	0.56	0.75	1	1.95	0.38
Basin-H	0.75	0.74	1	1.95	0.52
Basin-I	0.70	0.68	1	1.95	0.53
Basin-J	0.77	0.38	1	1.95	1.04
					5.96

*Rainfall intensity was picked from the Intensity/Duration curves for Grand Junction, Table A-1, SWMM

TABLE - 1a

COMPOSITE RUNOFF COEFFICIENTS
For: 28 1/4 Rd. SENIOR HOUSING

PRE-DEVELOPMENT RUNOFF COEFFICIENTS (2-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-A Unit Area	BASIN-A Wt'd Value	BASIN-B Unit Area	BASIN-B Wt'd Value	BASIN-C Unit Area	BASIN-C Wt'd Value	BASIN-D Unit Area	BASIN-D Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
				(Northern landscape area - assuming pre. & Post. Devel. "C"s the same)									
Total Basin Area:		(Acres)		0.44		0.79		0.65		0.74		0.00	
Pavement and Roofs		0.93	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.20 to 0.28	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	6+%	0.28 to 0.36	0.30	0.44	0.13	0.79	0.24	0.65	0.20	0.74	0.22	0.00	0.00
COMPOSITE "C" VALUE					0.30		0.30		0.30		0.30		0.00

POST-DEVELOPMENT RUNOFF COEFFICIENTS (2-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-A Unit Area	BASIN-A Wt'd Value	BASIN-B Unit Area	BASIN-B Wt'd Value	BASIN-C Unit Area	BASIN-C Wt'd Value	BASIN-D Unit Area	BASIN-D Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		(Acres)		0.44		0.79		0.65		0.74		0.00	
Pavement and Roofs		0.93	0.93	0.00	0.00	0.47	0.44	0.45	0.42	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.20 to 0.28	0.24	0.00	0.00	0.20	0.05	0.14	0.03	0.00	0.00	0.00	0.00
Native	6+%	0.28 to 0.36	0.30	0.44	0.13	0.12	0.04	0.05	0.02	0.74	0.22	0.00	0.00
COMPOSITE "C" VALUE					0.30		0.66		0.72		0.30		0.00

COMPOSITE RUNOFF COEFFICIENTS
For: 28 1/4 Rd. SENIOR HOUSING

PRE-DEVELOPMENT RUNOFF COEFFICIENTS (2-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-E Unit Area	BASIN-E Wt'd Value	BASIN-F Unit Area	BASIN-F Wt'd Value	BASIN-G Unit Area	BASIN-G Wt'd Value	BASIN-H Unit Area	BASIN-H Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.41**		**0.46**		**0.38**		**0.52**		**0.00**	
Pavement and Roofs		0.93	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.20 to 0.28	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	0% to 2%	0.20 to 0.28	0.22	0.41	0.09	0.46	0.10	0.38	0.08	0.52	0.11	0.00	0.00
COMPOSITE "C" VALUE					**0.22**		**0.22**		**0.22**		**0.22**		**0.00**

POST-DEVELOPMENT RUNOFF COEFFICIENTS (2-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-E Unit Area	BASIN-E Wt'd Value	BASIN-F Unit Area	BASIN-F Wt'd Value	BASIN-G Unit Area	BASIN-G Wt'd Value	BASIN-H Unit Area	BASIN-H Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.41**		**0.46**		**0.38**		**0.52**		**0.00**	
Pavement and Roofs		0.93	0.93	0.29	0.27	0.26	0.24	0.28	0.26	0.38	0.35	0.00	0.00
Lawns	0% to 2%	0.20 to 0.28	0.24	0.09	0.02	0.09	0.00	0.10	0.02	0.10	0.02	0.00	0.00
Native	0% to 2%	0.20 to 0.28	0.22	0.03	0.01	0.11	0.02	0.00	0.00	0.04	0.01	0.00	0.00
COMPOSITE "C" VALUE					**0.73**		**0.58**		**0.75**		**0.74**		**0.00**

COMPOSITE RUNOFF COEFFICIENTS
For: 28 1/4 Rd. SENIOR HOUSING

PRE-DEVELOPMENT RUNOFF COEFFICIENTS (2-YEAR EVENT

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-I Unit Area	BASIN-I Wt'd Value	BASIN-J Unit Area	BASIN-J Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.53**		**1.04**		**0.00**		**0.00**		**0.00**	
Pavement and Roofs		0.93	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.20 to 0.28	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	0% to 2%	0.20 to 0.28	0.22	0.53	0.12	1.04	0.23	0.00	0.00	0.00	0.00	0.00	0.00
COMPOSITE "C" VALUE					**0.22**		**0.22**		**0.00**		**0.00**		**0.00**

POST-DEVELOPMENT RUNOFF COEFFICIENTS (2-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-I Unit Area	BASIN-I Wt'd Value	BASIN-J Unit Area	BASIN-J Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.53**		**1.04**		**0.00**		**0.00**		**0.00**	
Pavement and Roofs		0.93	0.93	0.34	0.32	0.42	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.20 to 0.28	0.24	0.08	0.02	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	0% to 2%	0.20 to 0.28	0.22	0.11	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COMPOSITE "C" VALUE					**0.68**		**0.38**		**0.00**		**0.00**		**0.00**

TABLE - 1b

COMPOSITE RUNOFF COEFFICIENTS
For: 28 1/4 Rd. SENIOR HOUSING

PRE-DEVELOPMENT RUNOFF COEFFICIENTS (100-YEAR EVENT)

Description Surface Area	Runoff Coeff.'s	Selected Coeff.	BASIN-A Unit Area	BASIN-A Wt'd Value	BASIN-B Unit Area	BASIN-B Wt'd Value	BASIN-C Unit Area	BASIN-C Wt'd Value	BASIN-D Unit Area	BASIN-D Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
			(Northern landscape area - assuming pre. & Post. Devel. "C"s the same)									
Total Basin Area:	**(Acres)**		**0.44**		**0.79**		**0.65**		**0.74**		**0.00**	
Pavement and Roofs	0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawns 0% to 2%	0.26 to 0.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native 6+%	0.35 to 0.43	0.37	0.44	0.16	0.79	0.29	0.65	0.24	0.74	0.27	0.00	0.00
COMPOSITE "C" VALUE				**0.37**		**0.37**		**0.37**		**0.37**		**0.00**

POST-DEVELOPMENT RUNOFF COEFFICIENTS (100-YEAR EVENT)

Description Surface Area	Runoff Coeff.'s	Selected Coeff.	BASIN-A Unit Area	BASIN-A Wt'd Value	BASIN-B Unit Area	BASIN-B Wt'd Value	BASIN-C Unit Area	BASIN-C Wt'd Value	BASIN-D Unit Area	BASIN-D Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:	**(Acres)**		**0.44**		**0.79**		**0.65**		**0.74**		**0.00**	
Pavement and Roofs	0.95	0.95	0.00	0.00	0.47	0.45	0.45	0.43	0.00	0.00	0.00	0.00
Lawns 0% to 2%	0.26 to 0.34	0.28	0.00	0.00	0.20	0.06	0.14	0.04	0.00	0.00	0.00	0.00
Native 6+%	0.35 to 0.43	0.37	0.44	0.16	0.12	0.04	0.05	0.02	0.74	0.27	0.00	0.00
COMPOSITE "C" VALUE				**0.37**		**0.69**		**0.75**		**0.37**		**0.00**

COMPOSITE RUNOFF COEFFICIENTS
For: 28 1/4 Rd. SENIOR HOUSING

PRE-DEVELOPMENT RUNOFF COEFFICIENTS (100-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-E Unit Area	BASIN-E Wt'd Value	BASIN-F Unit Area	BASIN-F Wt'd Value	BASIN-G Unit Area	BASIN-G Wt'd Value	BASIN-H Unit Area	BASIN-H Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.41**		**0.46**		**0.38**		**0.52**		**0.00**	
Pavement and Roofs		0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.26 to 0.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	0% to 2%	0.35 to 0.43	0.37	0.41	0.15	0.46	0.17	0.38	0.14	0.52	0.19	0.00	0.00
COMPOSITE "C" VALUE					**0.37**		**0.37**		**0.37**		**0.37**		**0.00**

POST-DEVELOPMENT RUNOFF COEFFICIENTS (100-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-E Unit Area	BASIN-E Wt'd Value	BASIN-F Unit Area	BASIN-F Wt'd Value	BASIN-G Unit Area	BASIN-G Wt'd Value	BASIN-H Unit Area	BASIN-H Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.41**		**0.46**		**0.38**		**0.52**		**0.00**	
Pavement and Roofs		0.95	0.95	0.29	0.28	0.26	0.25	0.28	0.27	0.38	0.36	0.00	0.00
Lawns	0% to 2%	0.26 to 0.34	0.28	0.09	0.03	0.09	0.00	0.10	0.03	0.10	0.03	0.00	0.00
Native	0% to 2%	0.35 to 0.43	0.37	0.03	0.01	0.11	0.04	0.00	0.00	0.04	0.01	0.00	0.00
COMPOSITE "C" VALUE					**0.76**		**0.63**		**0.77**		**0.78**		**0.00**

TABLE - 3b

COMPOSITE RUNOFF COEFFICIENTS
For: 28 1/4 Rd. SENIOR HOUSING

PRE-DEVELOPMENT RUNOFF COEFFICIENTS (100-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-I Unit Area	BASIN-I Wt'd Value	BASIN-J Unit Area	BASIN-J Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.53**		**1.04**		**0.00**		**0.00**		**0.00**	
Pavement and Roofs		0.95	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.26 to 0.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	0% to 2%	0.35 to 0.43	0.37	0.53	0.20	1.04	0.38	0.00	0.00	0.00	0.00	0.00	0.00
COMPOSITE "C" VALUE					**0.37**		**0.37**		**0.00**		**0.00**		**0.00**

POST-DEVELOPMENT RUNOFF COEFFICIENTS (100-YEAR EVENT)

Description Surface Area		Runoff Coeff.'s	Selected Coeff.	BASIN-I Unit Area	BASIN-I Wt'd Value	BASIN-J Unit Area	BASIN-J Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value	BASIN Unit Area	BASIN Wt'd Value
Total Basin Area:		**(Acres)**		**0.53**		**1.04**		**0.00**		**0.00**		**0.00**	
Pavement and Roofs		0.95	0.95	0.34	0.32	0.42	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Lawns	0% to 2%	0.26 to 0.34	0.28	0.08	0.02	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Native	0% to 2%	0.35 to 0.43	0.37	0.11	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COMPOSITE "C" VALUE					**0.73**		**0.39**		**0.00**		**0.00**		**0.00**

Selection of "C" factors

Soil Type is Billings Clay Loam – SCS soil type C

Slopes:
North area developed ~9%
All in ground areas btwn 0-2%
Undeveloped use 2-6% for an average

"C" Coefficients

	Undeveloped: Both "Bare ground" & "Meadow"		Developed	
	0.28–0.36 USE 0.30	(2yr)	0.20–0.28.	USE .22
	0.35–0.43 USE 0.37	(100yr)	0.26–0.34	USE .28

Developed: Landscaped areas to the north will be shrubs / bushes / trees / minimal native grasses. Runoff potential should Not increase. Add'l plantings / Terrain etc should slow down runoff, but to be conservative, use Same coefficients as Undeveloped

2yr. = 0.30
100yr. 0.37

Roofs & Pavement 2yr. = .93
100yr. = .95

Lawn .20–.28 Use .24
.26–.34 Use .30

Pre-development

Time of Concentration:

All the basins in the developed areas are small enough and the percentage of hardscape is high enough that the min. of 5 minutes will be used.

In the northern area where there will be only Trees/ scrubs/ bushes & native grasses

Per equa. P.B-3 SWMM

$$T_o = \frac{1.8(1.1-C)L^{0.5}}{S^{0.33}}$$

Upper Steep Area

$C_2 = 0.30$
$C_{100} = 0.37$
$L = 315$ LF
$S = 8.92\%$

$$\therefore T_{o_2} = \frac{1.8(1.1-0.3)315^{0.5}}{8.92^{0.33}} = 12.4 \text{ min}$$

$$T_{o_{100}} = \frac{1.8(1.1-0.37)315^{0.5}}{8.92^{0.33}} = 11.3 \text{ min}$$

Lower Flat Area

$C_2 = 0.30$
$C_{100} = 0.37$
$L = 300 =$
$S = 1.00\%$

$$T_{o_2} = \frac{1.8(1.1-0.3)300^{0.5}}{1^{0.33}} = 24.9 \text{ min}$$

$$T_{o_{100}} = \frac{1.8(1.1-0.37)300^{0.5}}{1^{0.33}} = 22.8 \text{ min}$$

Pre-development Time of Concentration in lower two reaches.
The overall travel path is 902 ft long, so if the overland flow portion can only be 300' long & broke the lower flatter area into 2 reaches of 300' each to calculate flow velocity and thus TOC in each.

2-yr Event.

To calc. the $\tilde{Q}_2$ for the upper steep area, & used the T_{O_2} = 12.4 min, From Table A-1, i = 1.41

$\therefore \tilde{Q}_2 = 0.30(1.41)2Ac = 0.85$ cfs

To calc the $\tilde{Q}_2$ for the lower flat area, & used the T_{O_2} = 24.9 min, From Table A-1, i = 0.98

$\therefore \tilde{Q}_2 = 0.30(0.98)2Ac = 0.59$ cfs

Flow velocity by Manning Eq. in middle reach based on 0.85 cfs $\Rightarrow$ 3.72 fps

Flow velocity by Manning Eq. in lower reach based on 0.85 + 0.59 = 1.44 cfs $\Rightarrow$ 4.25 fps

Based on 300 ft in each reach

Middle T_T = 300/3.72 = 1.34 min
Lower T_T = 300/4.25 = 1.18 min
} 2.52 min

Total 2yr T_T = 2.52 min + 12.4 min + 24.9 min = 39.8 min

$\therefore$ Intens. i = 0.76

100 yr. Event.

To Calc the $\tilde{Q}_{100}$ for the upper strip Area, D

used $T_{C_{100}}$ = 11.3 min, From Table A-1, i = 3.66

$\therefore \tilde{Q}_{100} = 0.37(3.66)2\,Ac = 2.71$ cfs

To Calc the $\tilde{Q}_{100}$ for the middle flat area, D

used $T_{C_{100}}$ = 22.8 min, From Table A-1, i = 2.63

$\therefore Q_{100} = 0.37(2.63)2\,Ac = 1.95$ cfs

Flow velocity by Mannings Eq. in upper reach based on 2.71 cfs $\Rightarrow$ 4.98 fps

Flow velocity by Mannings Eq in lower reach based on 2.71 + 1.95 cfs = 4.65 cfs $\Rightarrow$ 5.69 fps

Based on 300 ft in each reach

Middle T_T = 300/4.98 = 1.00 min
Lower T_T = 300/5.69 = 0.88 min
} 1.88 min

Total 100-yr T_T = 1.88 min + 11.3 min + 22.8 min

= 36.0 min

$\therefore$ Intens. Eq = 2.06

West Side

W8 → W7 (72') — 1.36 — 12" @ 2.92 fps — 24.7 sec
1.36

W7 → W6 (133') — 3.77 — 12" Full V = 3.77 fps w/bypass Qmax = 2.73 cfs — 48.7 sec
2.41

W6 → W4 (57') — 4.47 — 18" d = 1.02 V = 5.06 fps — 11.3 sec
2.70

W4 → W3 (77') — 7.28 — 18" d = 1.12 V = 5.16 fps — 14.9 sec
0.81

W3 → W2 (214') — 10.27 — 21" d d = 1.23' V = 5.66 fps — 37.8 sec
1.54
1.45

W2 → W1 (132') — 12.28 — 21" d. Full w/bypass V = 5.05 fps — 26.1 sec
2.01

East Side

E4 → E3 — 1.43 — Qmax 12" @ 0.5% = 2.73
1.43

E3 → E2/E1 — 3.35 — Use 12" w/some bypass Qmax 12" = 2.73 cfs
1.92

Σ Time = 163.5 sec
T_t = 2.73 min

Travel Time in Conduit System

Assume all pipes @ 0.50%
RCP, min. Dia 12"

Concrete Pipe

Q_{max} for 18" @ 0.50% n = 0.012 = 8.05 cfs
" " 21" @ " " 12.14 cfs

Area Inlets

PVC Pipe 8" PVC @ 0.50% n = 0.10 Q_{max} = 1.13 cfs
10" " " 1.99 cfs
12" " " 3.28 cfs

100-yr Composite "C" for detention calcs
= Σ Indiv. Composite C's X Areas ÷ Total Area
= 0.60

100-yr Time of Concentration for detention calcs
= Overland flow time of most extreme basin (Basin "D")
which should = $T_{c_{100}}$ as calc'd on S-2 = 11.3 min.
plus the travel time of each reach of pipe flow
from Basin D → Basin H

Trapezoidal Channel Analysis & Design
Open Channel - Uniform Flow

Worksheet Name: 0249-001

Comment: Terra Prop., Hist. 100-Yr middle reach Vel.

Solve For Depth

Given Input Data:

Bottom Width.....	0.00 ft
Left Side Slope..	4.00:1 (H:V)
Right Side Slope.	4.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.1000 ft/ft
Discharge.....	2.71 cfs

Computed Results:

Depth.....	0.37 ft
Velocity.....	4.98 fps
Flow Area.....	0.54 sf
Flow Top Width...	2.95 ft
Wetted Perimeter.	3.04 ft
Critical Depth...	0.49 ft
Critical Slope...	0.0218 ft/ft
Froude Number....	2.04 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 0249-001

Comment: Terra Prop., Hist. 100-Yr lower reach Vel.

Solve For Depth

Given Input Data:

Bottom Width.....	0.00 ft
Left Side Slope..	4.00:1 (H:V)
Right Side Slope.	4.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.1000 ft/ft
Discharge.....	4.65 cfs

Computed Results:

Depth.....	0.45 ft
Velocity.....	5.69 fps
Flow Area.....	0.82 sf
Flow Top Width...	3.61 ft
Wetted Perimeter.	3.73 ft
Critical Depth...	0.61 ft
Critical Slope...	0.0203 ft/ft
Froude Number....	2.11 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 0249-001

Comment: Terra Prop., Hist. 2-Yr. middle reach Vel.

Solve For Depth

Given Input Data:

Bottom Width.....	0.00 ft
Left Side Slope..	4.00:1 (H:V)
Right Side Slope.	4.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.1000 ft/ft
Discharge.....	0.85 cfs

Computed Results:

Depth.....	0.24 ft
Velocity.....	3.72 fps
Flow Area.....	0.23 sf
Flow Top Width...	1.91 ft
Wetted Perimeter.	1.97 ft
Critical Depth...	0.31 ft
Critical Slope...	0.0255 ft/ft
Froude Number....	1.90 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 0249-001

Comment: Terra Prop., Hist. 2-Yr. lower reach Vel.

Solve For Depth

Given Input Data:

Bottom Width.....	0.00 ft
Left Side Slope..	4.00:1 (H:V)
Right Side Slope.	4.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.1000 ft/ft
Discharge.....	1.44 cfs

Computed Results:

Depth.....	0.29 ft
Velocity.....	4.25 fps
Flow Area.....	0.34 sf
Flow Top Width...	2.33 ft
Wetted Perimeter.	2.40 ft
Critical Depth...	0.38 ft
Critical Slope...	0.0237 ft/ft
Froude Number....	1.96 (flow is Supercritical)

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 "A-1" INTENSITY-DURATION-FREQUENCY (IDF) TABLE					
Time (min)	2-Year Intensity (in/hr)	100-Year Intensity (in/hr)	Time (min)	2-Year Intensity (in/hr)	100-Year Intensity (in/hr)
5	1.95	4.95	33	0.83	2.15
6	1.83	4.65	34	0.82	2.12
7	1.74	4.40	35	0.81	2.09
8	1.66	4.19	36	0.80	2.06
9	1.59	3.99	37	0.79	2.03
10	1.52	3.80	38	0.78	2.00
11	1.46	3.66	39	0.77	1.97
12	1.41	3.54	40	0.76	1.94
13	1.36	3.43	41	0.75	1.91
14	1.32	3.33	42	0.74	1.88
15	1.28	3.24	43	0.73	1.85
16	1.24	3.15	44	0.72	1.82
17	1.21	3.07	45	0.71	1.79
18	1.17	2.99	46	0.70	1.76
19	1.14	2.91	47	0.69	1.73
20	1.11	2.84	48	0.68	1.70
21	1.08	2.77	49	0.67	1.67
22	1.05	2.70	50	0.66	1.64
23	1.02	2.63	51	0.65	1.61
24	1.00	2.57	52	0.64	1.59
25	0.98	2.51	53	0.63	1.57
26	0.96	2.46	54	0.62	1.55
27	0.94	2.41	55	0.61	1.53
28	0.92	2.36	56	0.60	1.51
29	0.90	2.31	57	0.59	1.49
30	0.88	2.27	58	0.58	1.47
31	0.86	2.23	59	0.57	1.45
32	0.84	2.19	60	0.56	1.43
Source: Mesa County 1991					

NOTE: THIS IS A REPRODUCTION OF TABLE I, APPENDIX A, "DESIGN CHARTS FOR OPEN CHANNEL FLOW", (HDS #3)

	Manning's n range [8]
I. Closed conduits:	
A. Concrete pipe	0.011–0.013
B. Corrugated-metal pipe or pipe-arch:	
1. 2⅔ by ½-in. corrugation (riveted pipe): [8]	
a. Plain or fully coated	0.024
b. Paved invert (range values are for 25 and 50 percent of circumference paved):	
(1) Flow full depth	0.021–0.018
(2) Flow 0.8 depth	0.021–0.016
(3) Flow 0.6 depth	0.019–0.013
2. 6 by 2-in. corrugation (field bolted)	0.03
C. Vitrified clay pipe	0.012–0.014
D. Cast-iron pipe, uncoated	0.013
E. Steel pipe	0.009–0.011
F. Brick	0.014–0.017
G. Monolithic concrete:	
1. Wood forms, rough	0.015–0.017
2. Wood forms, smooth	0.012–0.014
3. Steel forms	0.012–0.013
H. Cemented rubble masonry walls:	
1. Concrete floor and top	0.017–0.022
2. Natural floor	0.019–0.025
I. Laminated treated wood	0.015–0.017
J. Vitrified clay liner plates	0.015
II. Open channels, lined [4] (straight alinement): [5]	
A. Concrete, with surfaces as indicated:	
1. Formed, no finish	0.013–0.017
2. Trowel finish	0.012–0.014
3. Float finish	0.013–0.015
4. Float finish, some gravel on bottom	0.015–0.017
5. Gunite, good section	0.016–0.019
6. Gunite, wavy section	0.018–0.022
B. Concrete, bottom float finished, sides as indicated:	
1. Dressed stone in mortar	0.015–0.017
2. Random stone in mortar	0.017–0.020
3. Cement rubble masonry	0.020–0.025
4. Cement rubble masonry, plastered	0.016–0.020
5. Dry rubble (riprap)	0.020–0.030
C. Gravel bottom, sides as indicated:	
1. Formed concrete	0.017–0.020
2. Random stone in mortar	0.020–0.023
3. Dry rubble (riprap)	0.023–0.033
D. Brick	0.014–0.017
E. Asphalt:	
1. Smooth	0.013
2. Rough	0.016
F. Wood, planed, clean	0.011–0.013
G. Concrete-lined excavated rock:	
1. Good section	0.017–0.020
2. Irregular section	0.022–0.027
III. Open channels, excavated [4] (straight alinement,[5] natural lining):	
A. Earth, uniform section:	
1. Clean, recently completed	0.016–0.018
2. Clean, after weathering	0.018–0.020
3. With short grass, few weeds	0.022–0.027
4. In gravelly soil, uniform section, clean	0.022–0.025
B. Earth, fairly uniform section:	
1. No vegetation	0.022–0.025
2. Grass, some weeds	0.025–0.030
3. Dense weeds or aquatic plants in deep channels	0.030–0.035
4. Sides clean, gravel bottom	0.025–0.030
5. Sides clean, cobble bottom	0.030–0.040
C. Dragline excavated or dredged:	
1. No vegetation	0.028–0.033
2. Light brush on banks	0.035–0.050
D. Rock:	
1. Based on design section	0.035
2. Based on actual mean section:	
a. Smooth and uniform	0.035–0.040
b. Jagged and irregular	0.040–0.045
E. Channels not maintained, weeds and brush uncut:	
1. Dense weeds, high as flow depth	0.08–0.12
2. Clean bottom, brush on sides	0.05–0.08
3. Clean bottom, brush on sides, highest stage of flow	0.07–0.11
4. Dense brush, high stage	0.10–0.14
IV. Highway channels and swales with maintained vegetation [6] (values shown are for velocities of 2 and 6 f.p.s.):	
A. Depth of flow up to 0.7 foot:	
1. Bermudagrass, Kentucky bluegrass, buffalograss:	
a. Mowed to 2 inches	0.07–0.045
b. Length 4–6 inches	0.09–0.05
2. Good stand, any grass:	
a. Length about 12 inches	0.18–0.09
b. Length about 24 inches	0.30–0.15
3. Fair stand, any grass:	
a. Length about 12 inches	0.14–0.08
b. Length about 24 inches	0.25–0.13
B. Depth of flow 0.7–1.5 feet:	
1. Bermudagrass, Kentucky bluegrass, buffalograss:	
a. Mowed to 2 inches	0.05–0.035
b. Length 4 to 6 inches	0.06–0.04
2. Good stand, any grass:	
a. Length about 12 inches	0.12–0.07
b. Length about 24 inches	0.20–0.10
3. Fair stand, any grass:	
a. Length about 12 inches	0.10–0.06
b. Length about 24 inches	0.17–0.09
V. Street and expressway gutters:	
A. Concrete gutter, troweled finish	0.012
B. Asphalt pavement:	
1. Smooth texture	0.013
2. Rough texture	0.016
C. Concrete gutter with asphalt pavement:	
1. Smooth	0.013
2. Rough	0.015
D. Concrete pavement:	
1. Float finish	0.014
2. Broom finish	0.016
E. For gutters with small slope, where sediment may accumulate, increase above values of n by	*0.002*
VI. Natural stream channels:[9]	
A. Minor streams [5] (surface width at flood stage less than 100 ft.):	
1. Fairly regular section:	
a. Some grass and weeds, little or no brush	0.030–0.035
b. Dense growth of weeds, depth of flow materially greater than weed height	0.035–0.05
c. Some weeds, light brush on banks	0.035–0.05
d. Some weeds, heavy brush on banks	0.05–0.07
e. Some weeds, dense willows on banks	0.06–0.08
f. For trees within channel, with branches submerged at high stage, increase all above values by	*0.01–0.02*
2. Irregular sections, with pools, slight channel meander; increase values given in 1a–e about	*0.01–0.02*
3. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stage:	
a. Bottom of gravel, cobbles, and few boulders	0.04–0.05
b. Bottom of cobbles, with large boulders	0.05–0.07
B. Flood plains (adjacent to natural streams):	
1. Pasture, no brush:	
a. Short grass	0.030–0.035
b. High grass	0.035–0.05
2. Cultivated areas:	
a. No crop	0.03–0.04
b. Mature row crops	0.035–0.045
c. Mature field crops	0.04–0.05
3. Heavy weeds, scattered brush	0.05–0.07
4. Light brush and trees: [10]	
a. Winter	0.05–0.06
b. Summer	0.06–0.08
5. Medium to dense brush: [10]	
a. Winter	0.07–0.11
b. Summer	0.10–0.16
6. Dense willows, summer, not bent over by current	0.15–0.20
7. Cleared land with tree stumps, 100–150 per acre:	
a. No sprouts	0.04–0.05
b. With heavy growth of sprouts	0.06–0.08
8. Heavy stand of timber, a few down trees, little undergrowth:	
a. Flood depth below branches	0.10–0.12
b. Flood depth reaches branches	0.12–0.16
C. Major streams (surface width at flood stage more than 100 ft.): Roughness coefficient is usually less than for minor streams of similar description on account of less effective resistance offered by irregular banks or vegetation on banks. Values of n may be somewhat reduced. Follow recommendation in publication cited [4] if possible. The value of n for larger streams of most regular section, with no boulders or brush, may be in the range of	0.028–0.033

Shallow overland

TYPICAL MANNING "n" VALUES | TABLE "F-1a"

Storage Volume & Outlet Structure

Procedure as outlined in Appendix "N" SWMM

3.1 Page N-6

	Pre-Level		Post-Level	
	2yr	100yr	2yr	100yr
T_c	39.8	36.0	5 min	5 min
C	0.30	0.37	0.22	0.28
Q_p	1.36	4.54	6.50	17.63

3.2 Given that the basin acts like a bowl with only 1 outlet,

$Q_{max} = Q_p$

	2yr	100yr
Q_{max}	1.36	4.54

3.3 Calc. Q_{r_2} & $Q_{r_{100}}$

Since we have sloping sides, $Q_r = \sim 0.82\, Q_{max}$

	2yr	100yr
Q_r	1.12 cfs	3.72 cfs

3.4 $$T_{d_2} = \left(\frac{633.4\,(0.22)\,5.96}{1.12 - \frac{1.12^2\,(5)}{81.2\,(0.22)\,5.96}} \right)^{0.5} - 15.6 = 12.38$$

$$T_{d_{100}} = \left(\frac{1832\,(0.28)\,(5.96)}{3.72 - \frac{3.72^2\,(5)}{213\,(0.28)\,(5.96)}} \right)^{0.5} - 17.2 = 12.25$$

$$I_{d_2} = (40.6/12.38 + 15.6) = 18.88$$

$$I_{d_{100}} = (106.5/12.25 + 17.2) = 25.89$$

$Q_d = C_d A I_d$

$Q_{d_2} = 0.22(5.96)18.88 = 24.76$ cfs

$Q_{d_{100}} = 0.28(5.96)25.89 = 43.21$ cfs

$K = Tc_h / Tc_d$ ∴ $K_2 = 39.8/5 = 7.96$ $K_{100} = 36.0/5 = 7.20$

$V = 60(Q_d T_d - Q_r T_d - Q_r T_{c_d} + K Q_r T_{c_d}/2 + Q_r^2 T_{c_d}/(2Q_d))$

$V_2 = 60((24.76)(12.38) - (1.12)(12.38) - (1.12)(5) + (7.96)(1.12)(5)/2 + (1.12)^2(5)/(2)(24.76))$

$= 18,568.67$ cf. $= 0.4263$ Ac-ft

$V_{100} = 60((43.21)(12.25) - (3.72)(12.25) - (3.72)(5) + (7.20)(3.72)(5)/2 + (3.72)^2(5)/(2)(43.21))$

$= 31,974.79$ cf $= 0.7340$ Ac-ft

3.5 Basin to have 4:1 side slopes

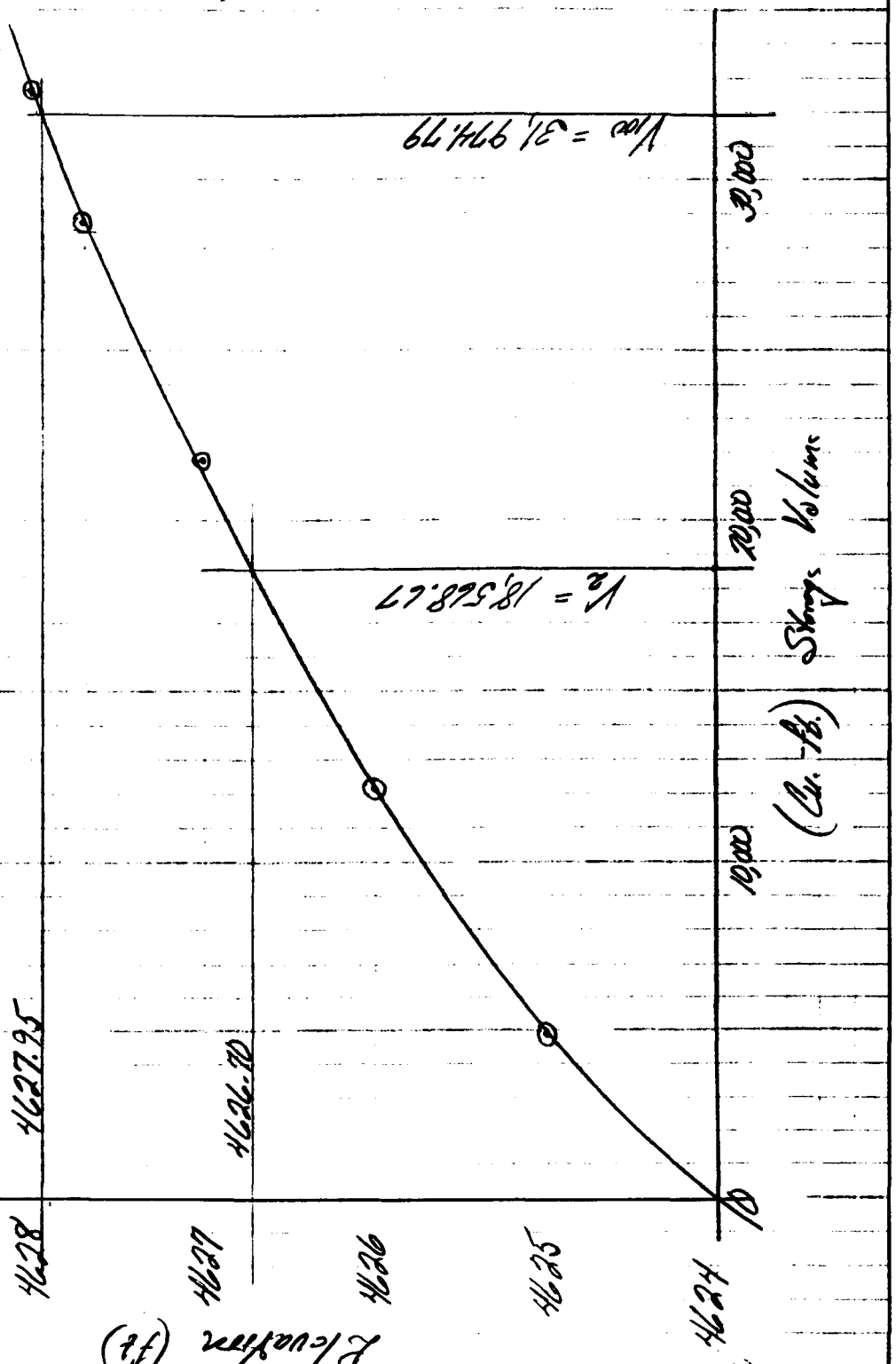
3.6

We have assumed that we will use all the available area sloping from the edges in towards the center of the ponding area at a 4:1 slope, creating as shallow a pond as possible. Using our depth Vs Volume calculations and the calculation of V(10) in step 3.4, it was determined that we would just exceed our volume requirements at a depth of 4' below parking shoulder elevations.

Stage Storage Relationship

Elev.	ft²	Vol. cf.	Σ Vol. cf.	Ac-ft
4624.0	3806			
		4,917	4,917.00	0.1129
4625.0	6028			
		7,205	12,122.50	0.2783
4626.0	8383			
		9,627.50	21,750.00	0.4993
4627.0	10872			
		6,962.67	28,712.67	0.6592
4627.7	13,000			
		3900.00	32,612.67	0.7487
4628.0	13,000			

3.6



3.7

2 Yr. depth = 4626.4 - 4624.0 = 2.4

100 Yr. depth = 4627.95 - 4624.0 = 3.95

3.8 Lower Stage Outlet Design.

Assume 0.2' orifices

$Q_r = 0.82 C A (2gh)^{0.5} =$

$C_r = 0.60$

$Q_r = 1.12$ cfs

$g = 32.2$ fps^2

$h = \sim 2.3 \pm$

$A = \frac{1.12}{0.82(0.60)(2 \cdot 32.2 \cdot 2.3)^{.5}} = 0.187$ ft

$= \frac{\pi D^2}{4}$

$D = 0.4880$ ft

Assume 0.50 Orifices

$\therefore h = 2.15$

$A = \frac{1.12}{0.82(0.60)((2)(32.2)(2.15))^{.5}} = 0.1935$

$D = 0.4963$ $\therefore$ OK

* Low flow orifice s/b 0.50' or 6" dia w/invert @ 4624.0

3.9

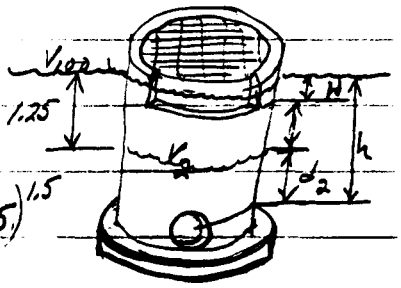
The weir invert for the 100 yr event is set at 4626.70

$d_w - d_2 = 4627.95 - 4626.70 = 1.25'$

Using a standpipe with a weir cut in the top the relationship is:

$$Q_{max} = Q_o + Q_w = C_o A (2gh)^{0.5} + \underbrace{3.33(L - 0.2H)}_{C_w} H^{1.5}$$

$Q_{max} = 4.54$ cfs



Assume $H = 6''$ solve for h

$$4.54 \text{ cfs} = (0.60)\left(\pi \frac{0.5^2}{4}\right)\left[(2)(32.2)(3.4)\right]^{0.5} + 3.33(L - 0.2(.5))(.5)^{1.5}$$

$4.54 = 1.7433 + 3.33(L - 0.2(.5))(.5)^{1.5}$

$2.7967 = 2.8399 = 0.3536L - 0.035$

$L = 2.4752'$

$d_2 = 2.15'$

$\therefore h = 3.40$

$\Rightarrow \sim 142°$

Try to get down to $\sim 2'$ for d_2

Check of math

$$4.54 = (0.60)\left(\pi \frac{0.5^2}{4}\right)\left[(2)(32.2)(3.4)\right]^{0.5} + 3.33(2.4752' - 0.2(0.5))(0.5)^{1.5}$$

$2.9141 - .177$

$= 1.7433 + 2.7964$

$= 4.5397$ OK

3/20/96 11:19

TWO STAGE OUTFALL CALCULATOR

Procedure as described in the City of Grand Junction's Storm Water Management Manual
See Page N-5

NOTE:
* Enter data from Drainage Study
** Vary this number until the desired result is obtained
X Calculated by spreadsheet (no entry required)

Orifice Flow (2-year event)

*	Water Surf. El.	4626.70 Ft.		
*	Orifice Invert	4624.00 Ft.		
**	Orifice Dia. (d)	0.49 Ft.		**Vary orifice diameter until areas match
*	Discharge (Qr2)	1.12 CFS		*Note: Qr is 0.82*Q2
*	"Co" Coef.	0.60		
X	Area	= (3.1416)d^2/4	= 0.18 SF	
X		= Qr/0.82C(2gh)^0.5	= 0.18 SF	

Combined Wier Flow and Orifice Flow (100-year event)

*	Water Surf. El.	4627.95
X	Wier Invert El.	4626.70

The 100-year storage elevation is set by storage requirements. The elevation of the invert of the wier is set equal to the 2-year storage elevation. The wier width will be calculated such that the discharge when added to the orifice discharge equals the 100-year discharge.

* Qr100 discharge = 3.72 CFS *Note: Qr is 0.82*Q2

Q (orifice) = 0.82CoA(2gh)^0.5 = 1.38 CFS

Wier Flow Equasion

Q= CwLH^1.5

X	Wier discharge =	2.34 CFS	
*	"Cw" Coef.	3.33	
X	Flow Depth (H) =	1.25 Ft.	
**	Wier Length (L)	0.50 Ft.	**Vary unitl "Q" = Q100

Q= Wier Flow + Orifice Flow
3.72 CFS **If this calculated flow equals Qr, the portion of the historic 100-year flow which is allowed, then the wier length is correct.

3.9

Attempt to get width down to 2 feet ±

Use depth of flow of 8" Vs. 6"

$$2.7967 = 3.33\left(L - 0.2\left(\tfrac{8}{12}\right)\right)\left(\tfrac{8}{12}\right)^{1.5}$$

$$= 1.8126L - 0.2417$$

$$L = 1.41 \quad (\tfrac{1}{4} \text{ of the pipe} = 1.57')$$

Use depth of flow of 7" Vs 6"

$$2.7967 = 3.33\left(L - 0.2\left(\tfrac{7}{12}\right)\right)\left(\tfrac{7}{12}\right)^{1.5}$$

$$= 1.8126L - 0.1731$$

$$L = 1.64'$$

Weir 8/6 : 2' wide

depth of flow = 7"

Crest elev = 4627.95 - 7" =

= 4627.37 ←

Use 36" dia riser

with metal grate cover

Top of pipe @ 4628.00

Top of Berm 4629.00

3.10

Summary

Outlet Control Device

36" RCP

Invert 4624.00

6" ϕ orifice w/ invert matching 4624.00

0.5' Wier opening, crest at 4626.70

depth of wier flow 1.25'

Top of Stand pipe 4628.00

Metal grate cover (expanded or bars)

Top of berm 4629.00

TABLE - 5a

RUNOFF VOLUME **(100-year)**
For: 28 1/4 SENIOR HOUSING
USING
RATIONAL METHOD Q=CxCfxIxA

BASIN	Q Volume	C Composite Coefficient	Cf Antecedent Precip. Fac.	I* Rainfall Intensity	A Basin Area
	cfs	n/a	n/a	in/hr	acres
	(Based on 300' of overland flow and 600' of shallow channel flow				
Historic flow=	4.54	0.37	1	2.06	5.95
Devel. flow =	17.63				
Basin-A	0.81	0.37	1	4.95	0.44
Basin-B	2.70	0.69	1	4.95	0.79
Basin-C	2.41	0.75	1	4.95	0.65
Basin-D	1.36	0.37	1	4.95	0.74
Basin-E	1.54	0.76	1	4.95	0.41
Basin-F	1.43	0.63	1	4.95	0.46
Basin-G	1.45	0.77	1	4.95	0.38
Basin-H	2.01	0.78	1	4.95	0.52
Basin-I	1.92	0.73	1	4.95	0.53
Basin-J	2.01	0.39	1	4.95	1.04
					5.96

*Rainfall intensity was picked from the Intensity/Duration curves for Grand Junction, Table A-1, SWMM

Orchard Lodge Congregate Living Facility

Engineers Opinion of Cost

03/20/96

DATE:
NAME OF DEVELOPMENT: Orchard Lodge Congregate Living Facility
LOCATION: E 1/4 of the SW 1/4,NW 1/4,Sec. 7, T1S, R1E Ute Meridian, Mesa County, Colorado
PRINTED NAME OF PERSON PREPARING James E. Langford

CONSTRUCTION COST ESTIMATE:

Water system:	Units	Quantity	Unit Price	Total Price
1 8" Wet Tap w/saddle and valve	LS	1	3,500.00	3,500
2 8" Waterline	LF	1550	11.50	17,825
3 Fire Hydrant Assemblies	EA	4	1,400.00	5,600
4 6" Gate Valve and Boxes	LS	4	450.00	1,800
5 8" Gate Valve and Boxes	LS	3	500.00	1,500
6 8" Cross, Bends or Tees	EA	16	175.00	2,800
	Sub-total Potable Water:			**33,025**

Sewer system:	Units	Quantity	Unit Price	Total Price
1 8-inch PVC Sewer	LF	141	14.80	2,087
2 Connection to Existing San. Sew. MH	EA	1	450.00	450
Sub-total Sanitary Sewer:				**2,537**

Site grading and paving	Units	Quantity	Unit Price	Total Price
1 Clearing and grubbing	Ac	6.00	650.00	3,900
2 Excavation	CY	3110.00	1.50	4,665
3 Embankment (on-site material)	CY	3110.00	2.00	6,220
4 Embankment (import material)	CY	7825.00	9.60	75,120
5 Concrete Removal & Disposal	SY	115.00	4.50	518
6 Asphalt Removal & Disposal	SY	120.00	3.50	420
7 6" Class-6	CY	940.00	15.00	14,100
8 3" Asphalt	TON	640.00	24.00	15,360
9 2.0' Curb & gutter	LF	393.00	11.50	4,520
10 6" Barrier Curb	LF	1165.00	10.50	12,233
11 6.5' Walk w/Thickened Edge	LF	193.00	18.00	3,474
12 5.5' Walk w/Thickened Edge	LF	232.00	16.00	3,712
13 8' Mono Curb/Gutter/Walk	LF	190.00	20.00	3,800
14 4' Concrete Walk	LF	582.00	14.00	8,148
15 5' Concrete Walk	LF	72.00	14.50	1,044
16 5.5' Concrete Walk	LF	22.00	15.00	330
17 6' Concrete Walk	LF	39.00	16.00	624

18 Concrete driveway sections	SY	80.00	32.00	2,560
19 Concrete block retaining wall	FF	250.00	12.50	3,125
20 7'x6" Concrete parking barriers	EA	15.00	50.00	750
21 Pavement/Parking striping	LF	1300.00	0.20	260
22 Concrete Accessible Ramps	SY	95.00	34.00	3,230
23 Concrete Pads	SY	250.00	22.00	5,500
24 "Cast in Place" Drain Swale	SY	3.00	28.00	84
25 1.5' Concrete Deco Stripping	LF	532.00	12.00	6,384
26 Decorative Paving	SY	21.00	36.00	756
				180,836

Drainage	Units	Quantity	Unit Price	Total Price
1 Detention Pond	Incl. in Excav./Embk.			0
2 Orifice Controled Outlet Works	LS	1.00	1,350.00	1,350
3 Curb Opening Inlets	EA	3.00	1,050.00	3,150
4 12" Area Inlets	EA	10.00	750.00	7,500
5 Grated Surface Inlets	EA	82.00	250.00	20,500
6 Grated shallow MH (Inlet)	EA	3.00	1,100.00	3,300
7 Storm Sewer Shallow MH	EA	1.00	1,100.00	1,100
8 Storm Sewer Standard MH	EA	5.00	1,250.00	6,250
9 6" PVC Storm Sewer	LF	1453.00	8.50	12,351
10 8" PVC Storm Sewer	LF	342.00	10.50	3,591
11 12" PVC Storm Sewer	LF	850.00	13.50	11,475
12 18" PVC Storm Sewer	LF	127.00	19.00	2,413
13 21" PVC Storm Sewer	LF	217.00	25.00	5,425
14 21" RCP Storm Sewer	LF	146.00	32.00	4,672
15 24" RCP Storm Sewer	LF	180.00	42.00	7,560
16 12" RCP Flared End Sec. w/Riprap	EA	1.00	250.00	250
17 21" RCP Flared End Sec. w/Riprap	EA	1.00	350.00	350
18 Fence removal and relocation	LF	200.00	6.00	1,200
	Sub-total Drainage:			**92,437**

Total Construction Costs: **308,834**

SIGNATURE OF DEVELOPER — DATE: 3-22-96

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

CITY ENGINEER — DATE

COMMUNITY DEVELOPMENT — DATE

Orchard Lodge Congregate Living Facility

Engineers Opinion of Cost

03/20/96

DATE:
NAME OF DEVELOPMENT: Orchard Lodge Congregate Living Facility
LOCATION: E 1/4 of the SW 1/4,NW 1/4,Sec. 7, T1S, R1E Ute Meridian, Mesa County, Colorado
PRINTED NAME OF PERSON PREPARING James E. Langford

CONSTRUCTION COST ESTIMATE:

Water system:	Units	Quantity	Unit Price	Total Price
1 8" Wet Tap w/saddle and valve	LS	1	3,500.00	3,500
2 8" Waterline	LF	1550	11.50	17,825
3 Fire Hydrant Assemblies	EA	4	1,400.00	5,600
4 6" Gate Valve and Boxes	LS	4	450.00	1,800
5 8" Gate Valve and Boxes	LS	3	500.00	1,500
6 8" Cross, Bends or Tees	EA	16	175.00	2,800
	Sub-total Potable Water:			**33,025**

Sewer system:	Units	Quantity	Unit Price	Total Price
1 8-inch PVC Sewer	LF	141	14.80	2,087
2 Connection to Existing San. Sew. MH	EA	1	450.00	450
Sub-total Sanitary Sewer:				**2,537**

Site grading and paving	Units	Quantity	Unit Price	Total Price
1 Clearing and grubbing	Ac	6.00	650.00	3,900
2 Excavation	CY	3110.00	1.50	4,665
3 Embankment (on-site material)	CY	3110.00	2.00	6,220
4 Embankment (import material)	CY	7825.00	9.60	75,120
5 Concrete Removal & Disposal	SY	115.00	4.50	518
6 Asphalt Removal & Disposal	SY	120.00	3.50	420
7 6" Class-6	CY	940.00	15.00	14,100
8 3" Asphalt	TON	640.00	24.00	15,360
9 2.0' Curb & gutter	LF	393.00	11.50	4,520
10 6" Barrier Curb	LF	1165.00	10.50	12,233
11 6.5' Walk w/Thickened Edge	LF	193.00	18.00	3,474
12 5.5' Walk w/Thickened Edge	LF	232.00	16.00	3,712
13 8' Mono Curb/Gutter/Walk	LF	190.00	20.00	3,800
14 4' Concrete Walk	LF	582.00	14.00	8,148
15 5' Concrete Walk	LF	72.00	14.50	1,044
16 5.5' Concrete Walk	LF	22.00	15.00	330
17 6' Concrete Walk	LF	39.00	16.00	624

18 Concrete driveway sections	SY	80.00	32.00	2,560
19 Concrete block retaining wall	FF	250.00	12.50	3,125
20 7'x6" Concrete parking barriers	EA	15.00	50.00	750
21 Pavement/Parking striping	LF	1300.00	0.20	260
22 Concrete Accessible Ramps	SY	95.00	34.00	3,230
23 Concrete Pads	SY	250.00	22.00	5,500
24 "Cast in Place" Drain Swale	SY	3.00	28.00	84
25 1.5' Concrete Deco Stripping	LF	532.00	12.00	6,384
26 Decorative Paving	SY	21.00	36.00	756
				180,836

Drainage	Units	Quantity	Unit Price	Total Price
1 Detention Pond	Incl. in Excav./Embk.			0
2 Orifice Controled Outlet Works	LS	1.00	1,350.00	1,350
3 Curb Opening Inlets	EA	3.00	1,050.00	3,150
4 12" Area Inlets	EA	10.00	750.00	7,500
5 Grated Surface Inlets	EA	82.00	250.00	20,500
6 Grated shallow MH (Inlet)	EA	3.00	1,100.00	3,300
7 Storm Sewer Shallow MH	EA	1.00	1,100.00	1,100
8 Storm Sewer Standard MH	EA	5.00	1,250.00	6,250
9 6" PVC Storm Sewer	LF	1453.00	8.50	12,351
10 8" PVC Storm Sewer	LF	342.00	10.50	3,591
11 12" PVC Storm Sewer	LF	850.00	13.50	11,475
12 18" PVC Storm Sewer	LF	127.00	19.00	2,413
13 21" PVC Storm Sewer	LF	217.00	25.00	5,425
14 21" RCP Storm Sewer	LF	146.00	32.00	4,672
15 24" RCP Storm Sewer	LF	180.00	42.00	7,560
16 12" RCP Flared End Sec. w/Riprap	EA	1.00	250.00	250
17 21" RCP Flared End Sec. w/Riprap	EA	1.00	350.00	350
18 Fence removal and relocation	LF	200.00	6.00	1,200
	Sub-total Drainage:			**92,437**

Total Construction Costs: **308,834**

Frank Wanlass — SIGNATURE OF DEVELOPER

3-22-96 — DATE

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

CITY ENGINEER — DATE

COMMUNITY DEVELOPMENT — DATE

DEVELOPMENT APPLICATION

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

Receipt _____
Date _____
Rec'd By _____

File No. _____

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

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
[ ] Subdivision Plat/Plan	[ ] Minor [ ] Major [ ] Resub				
[ ] Rezone				From: To:	
[ ] Planned Development	[ ] ODP [ ] Prelim [ ] Final				
[ ] Conditional Use					
[ ] Zone of Annex					
[ ] Text Amendment					
[X] Special Use & Site Plan Review		95,900 SF	28 1/4 RD. between ORCHARD & PATTERSON	R3-16	SENIORS CONGREGATE LIVING FACILITY
[ ] Vacation					[ ] Right-of-Way [ ] Easement

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

Name	Name	Name
SHADOWFAX PROPERTIES, INC. dba ORCHARD LODGE, LTD.		
Address	**Address**	**Address**
11999 SAN VICENTE BLVD., SUITE 440		
City/State/Zip	**City/State/Zip**	**City/State/Zip**
LOS ANGELES, CALIFORNIA 90049		
Business Phone No.	**Business Phone No.**	**Business Phone No.**
(310) 471-5852		

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

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

Frank Warlick 3-28-96
Signature of Person Completing Application Date

SHADOWFAX PROPERTIES, INC. dba ORCHARD LODGE, LTD.
By: Julie Gilbert
Signature of Property Owner(s) - Attach Additional Sheets if Necessary
JULIE A. GILBERT, ATTORNEY-IN-FACT

SPR-96-80

SUBMITTAL CHECKLIST

SITE PLAN REVIEW

Location: 28 1/4 RD BETWEEN ORCHARD Project Name: ORCHARD LODGE, LTD

ITEMS & PATTERSON

Date Received 4-3-96

Receipt # $360.00 # 3790

File # SPR-96-80

DESCRIPTION	SSID REFERENCE	City Community Development	City Dev. Eng.	City Utility Eng.	City Property Agent	City Parks/Recreation	City Fire Department	City Attorney	City Downtown Dev. Auth.	County Planning	County Bldg. Dept.	Irrigation District	Drainage District	Water District	Sewer District	U.S. West	Public Service	GVRP	CDOT	Corps of Engineers	Walker Field	Persigo WWT	Mesa County Health	State Environ. Health	City Sanitation	School Dist #51	TOTAL REQ'D.
● Application Fee	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	
● Planning Clearance*	VII-3	1																									
● 11"x17" Reduction of Assessor's Map	VII-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	
● Evidence of Title	VII-2	1			1			1																			
O Deeds	VII-1	1			1			1																			
Easements	VII-2	1	1	1	1			1																			
Avigation Easement	VII-1	1			1			1																			
O ROW	VII-2	1	1	1	1			1																			
O Improvements Agreement/Guarantee*	VII-2	1	1	1				1																			
O CDOT Access Permit	VII-3	1	1																								
O Industrial Pretreatment Sign-off	VII-4	1		1																							
● General Project Report	X-7	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	
O Elevation Drawing	IX-13	1	1																								
● Site Plan	IX-29	2	2	1	1	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 Site Plan	IX-29					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
O Grading and Drainage Plan	IX-16	1	2										1							1							
O Storm Drainage Plan and Profile	IX-30	1	2										1			1	1	1									
O Water and Sewer Plan and Profile	IX-34	1	2	1			1							1	1	1	1	1									
O 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																							
O Geotechnical Rerport	X-8	1	1								1																
O Final Drainage Report	X-5,6	1	2										1														
O Stormwater Management Plan	X-14	1	2										1							1							
O Phase I and II Environmental Rerpot	X-10,1	1	1																								
O Traffic Impact Study	X-15	1	2																1								

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

REVIEW COMMENTS

FILE #SPR-96-80 **TITLE HEADING:** Orchard Lodge

LOCATION: W side of 28 1/4 Road; N or Orchard Avenue

PETITIONER: Shadowfax Properties, Inc.

PETITIONER'S ADDRESS/TELEPHONE: dba Orchard Lodge, Inc.
11999 San Vicente Boulevard, #440
Los Angeles, CA 90049
310-471-5852

PETITIONER'S REPRESENTATIVE: Frank Warlick

STAFF REPRESENTATIVE: Michael Drollinger

NOTE: THE PETITIONER IS REQUIRED TO SUBMIT FOUR (4) COPIES OF WRITTEN RESPONSE AND REVISED DRAWINGS ADDRESSING ALL REVIEW COMMENTS.

MESA COUNTY BUILDING DEPARTMENT **4/4/96**
Bob Lee **244-1656**

No comments. We are reviewing plans for this project.

MESA COUNTY PLANNING **4/9/96**
Mike Joyce **244-1642**

Is there adequate buffering between the west drive and the Princess Subdivision?

GRAND JUNCTION DRAINAGE DISTRICT **4/10/96**
John L. Ballagh **242-4343**

1. The part of the tract south of the Grand Valley Irrigation Company Canal is within the Drainage District. The part north of the canal is in the area served by the Grand Valley Water Users Association.
2. The steep area south of the canal has been disturbed by development east and west of this site from near 28 3/4 Road (Picardy Drive) to 13th Street (Double Tree Apartments). All of the sites immediately below the canal have various reoccuring water table problems. Keeping the relatively steep slopes below the canal open with no permanent structures is the best option. Long term agreement for no habitable strucutres in that area may be most desireable.

CITY FIRE DEPARTMENT **4/12/96**
Hank Masterson **244-1414**

1. A flow test of existing hydrants is required to determine available water supply in the area-contact the Fire Department to schedule a time for this testing.
2. The number of hydrants proposed, size and layout of fire lines will be acceptable provided minimum fire flows are available. Hydrant locations should be changed as follows: The hydrant at the southeast corner should be moved to the south side of the building to point about 115' west of the east property line and about 60' south of the building. The hydrant near the northeast corner of the

building should be moved to the north side of the building to a point about 185' west of the east property line and about 100' north of the building.

3. The 12' wide access roads at the northwest and southwest corners must be a minimum of 20' wide.
4. The existing tree shown in the south parking lot must be removed since it blocks fire department access along the south side.
5. Exterior portions of the building along the west side are in excess of 150' from nearest fire department parking locations accessible to fire trucks. In addition, there are numerous interior portions of the building that will require attack lines in excess of 150' for firefighting. To solve these problems, an interior standpipe system is required. Along the west side of the building, one standpipe should be located and designed so that an exterior fire department connection is available for exterior fire fighting operations in this area. Locations and number of interior standpipes must be based on the need to have a standpipe within 150' of all interior portions of the building.
6. The entire building is required to have a complete NFPA 13 fire sprinkler system.
7. A complete fire alarm system is also required for this building.
8. A complete sealed set of plans showing the latest revisions is required to be submitted to the Fire Department.

PUBLIC SERVICE COMPANY **4/12/96**
John Salazar **244-2781**

GAS & ELECTRICC: Request that easterly 15 feet of this property be designated a utility easement.

CITY DEVELOPMENT ENGINEER **4/16/96**
Jody Kliska **244-1591**

1. Please provide a copy of the easement for the storm drain line across the property to the south.
2. A permit from the City Engineer's office is required for the utility cuts and concrete work in the right-of-way.
3. Transportation Capacity Payment is $9,627.70.

CITY PARKS & RECREATION **4/16/96**
Shawn Cooper **244-3869**

1. Collection of Parks & Open Space Fees - 111 units @ $225 = $24,975.
2. Parks is requesting the dedication of a 20' easement adjacent to the south edge of the Grand Valley Canal for the future use as a hike and bike trial along the canal. Access to this proposed future trail system would be a tremendous benefit to the residents of Orchard Lodge.

GRAND VALLEY IRRIGATION **4/17/96**
Phil Bertrand **242-2762**

1. Our Main Line Canal crosses through this property.
2. A 25 foot canal right-of-way from water's edge, on both sides of the canal, must not be encroached upon (north and south side).
3. All paper work and/or fees, for establishing an irrigaiton devliery point for this property must be completed.
4. Great care and planning for any landscaping, water flow, building, structures, etc., adjoining the canal right-of-way must be addressed carefully because of historical and unique water table problems in this area.

CITY UTILITY ENGINEER **4/16/96**
Trent Prall **244-1590**

Project Report:
1. Please correct the Water Purveyor to be the City of Grand Junction at (244-1554) rather than the Fruitvale Sanitation District.
2. Please correct the Health Department to "Mesa County Health Department". The phone number is correct.

Site Plan: Water: City
1. Please identify what size of meter is required as well as location of meter.
2. According to our records, the waterline in 28 1/4 Road should be a 6" line rather than an 8". Fire flow study should be performed to determine whether there is adequate flow to meet demands.

Irrigation:
1. If a City Water Tap is required for irrigation, please identify where meter is to be located.

CITY POLICE DEPARTMENT **4/17/96**
Dave Stassen **244-3587**

I would like to see a lighting plan for this development. All the parking areas and the west driveway need to be well lit (no areas dark enough to hide in).

COMMUNITY DEVELOPMENT DEPARTMENT **4/17/96**
Michael Drollinger **244-1439**

See attached comments.

FRUITVALE SANITATION **4/17/96**
C. Kellie Knowles **241-7076**

1. The Fruitvale Sanitation District can provide sewer service to the proposed 111-unit residential development through the 28 Road interceptor sewer and local collectors that extend to 28 1/4 road along E 1/2 Road (Orchard Avenue).
2. The only reference to sanitary sewer is a short section of 8" service line that is shown to connect to the District's manhole in 28 3/4 Road. A privately owned, operated and maintained sewer system to serve the facility is acceptable to the District, provided the system is installed to meet District standards for infiltration and inflow. This will include submittal of air test results for all private sewer mains from the tap at the District's existing manhole in 28 1/4 Road.
3. The developer will be required to execute an Extension Application and Extension Agreement with the District.
4. A monitoring manhole should be added on the private service line located out of traffic of 28 1/4 Road.
5. Although this is a proposed private sewer system, the District (and the City of Grand Junction) will require that plans of the system be submitted for approval prior to construction, including plan and profile of the sewer line. As-built drawings will also be required upon completion of construction.
6. Sewer tap fees and the monthly user fee will be based on the number of individual residential units built as a minimum. Due to the proposed "closed in" nature of the Orchard Lodge, the District may consider waiving tap fees for the small business-type amenities such as the bank, grocery store, beauty/barber shop, etc. Final determination of tap fees, plant investment fees and monthly user fees will be based on EQU's and will be made jointly by the District and the City of Grand Junction. The District's tap fee will be payable to the District upon completion of construction.

7. Additional information is requested in regard to operation of the proposed swimming pool for further review. If the pool is proposed to drain to the sanitary sewer, backwash and pool drain flow rates shall be subject to review and approval.
8. The District will reserve further comment until such time that additional detail is submitted.

To Date, Comments not received from:
City Attorney

STAFF REVIEW

FILE: #SPR-96-080
DATE: April 18, 1996
STAFF: Michael T. Drollinger
REQUEST: Site Plan Review - Orchard Lodge
LOCATION: W Side of 28 1/4 Road between Orchard Ave. & Patterson Road
ZONING: RMF-16

STAFF COMMENTS:

General

1. City Submittal Standards for Improvements and Development (SSID) Manual requires that all drawings be sized no larger than 24" X 36". ALL RESUBMITTED DRAWINGS must be on 24" X 36" sheets.

2. The following sheets were referenced in the plan set but were not provided:

   Sheet LC-2
   Sheet LC-4
   Sheet LP-4

   Please provide the missing sheets with your resubmittal.

3. All resubmitted plans must contain the seal and signature of the professional preparer where required by the SSID Manual.

4. All resubmitted plan sheets shall be bounded and rolled and a cover sheet shall be provided that serves as a key sheet for ALL plans (see also attached Cover Sheet checklist)

Site Plan

1. Not all review agencies received copies of the "Site Plan" drawing. Please provide sufficient copies with your resubmittal as part of the drawing set.

2. Please refer to the attached SSID Site Plan sheet and address the deficiencies identified on the checklist.

3. Please include detail of handicapped parking stalls on plan (Accessible Parking Stall Detail attached).

4. Section 5-5-1H1 of the Zoning and Development Code (ZDC) requires bicycle parking to be provided "sufficient to hold three (3) spaces or the number of bicycles equal to ten percent of the required off-street parking spaces for the use, whichever is greater. A detail of the bicycle rack is required. A sample bicycle rack detail is provided for reference.

5. If the notes on the Site Plan reference those provided on Sheet LG-1, please provide an appropriate reference.

Layout and Fine Grading Plan- Sheet LG-1

1. Regarding Construction Note #32: Auto Gate detail must be provided.

2. Regarding Construction Notes #33 & #34 - details for these items must be provided.

Irrigation Plan (Sheet LI-1)

NO COMMENTS

Landscape Plan (Identified as "Trees & Vines Planting Plan"- Sheet LP-1 & Shrubs and Ground Cover Planting Plan - Sheet LP-2)

1. Relabel drawings as follows
   "Landscape Plan - Trees and Vines" (Sheet LP-1)
   "Landscape Plan - Shrubs and Ground Cover" (Sheet LP-2)

2. Enlarged plan for central courtyard was not provided with submittal - please provide with resubmittal.

3. Attached please find a copy of recommended plants for the Grand Valley climate - please check your plant material list against the recommended list and adjust as required. Also, you may wish to contact a local nursery concerning the local availability of the desired plant materials.

4. The standards of Section 5-5-1F2c(2) regarding the protection of landscape areas from vehicular encroachment have not been adequately addressed. Both the Landscape Plan and Site Plan must be modified to meet the Code requirement.

5. The standards of Section 5-5-1F2a regarding street frontage landscaping have not been met. Please revise the Landscape Plan and/or the Grading Plan to meet the Code requirements.

Lighting Plan (Identified as Schematic Lighting Plan - Sheet LL-1)

1. Isofootcandle diagram not provided as required by Code - see attached Code excerpt. All areas in the parking lot must have a minimum of 0.6 footcandles of illumination. Please provide a light detail for all proposed parking lot lights.

Engineering Drawings (prepared by Thompson-Langford - 8 sheets)

1. Grading and Drainage Plan drawings refer to "975 lf 8' masonary perimeter wall". City ZDC does not permit walls greater than 6 feet in height to be constructed within required building setback areas. Please lower wall height to six feet and provide a wall construction detail.

Miscillaneous

1. All improvements within the public right-of-way must be guaranteed with a Development Improvements Agreement and form of monetary guarantee acceptable to the City prior to issuance of a Planning Clearance. Attached please find a Development Improvements Agreement with instructions for you use.

2. Attached please find an updated version of the Planning Clearance along with your original. Please complete the updated version and forward it to us with your resubmittal.

REVISED PLANS ARE REQUIRED which address the items in the review comments. Please submit four sets of stamped drawings for review.

PLEASE TAKE NOTE OF THE FOLLOWING:

1. ALL SIGNS TO BE ERECTED ON THE SITE WILL REQUIRE A SIGN PERMIT PRIOR TO INSTALLATION OF THE SIGN.

2. SITE IMPROVEMENTS (INCLUDING LANDSCAPING) MUST BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS. ANY MODIFICATIONS MUST BE APPROVED, IN WRITING AND/OR WITH REVISED PLANS, BY THE COMMUNITY DEVELOPMENT DEPARTMENT. FAILURE TO INSTALL SITE IMPROVEMENTS AS PER THE APPROVED PLANS MAY DELAY THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

3. SITE IMPROVEMENTS (E.G. LANDSCAPING, SIDEWALK, ETC.) NOT COMPLETED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY MUST BE GUARANTEED.

You are urged to contact the Community Development Department if you require clarification or further explanation of any items.

h:\cityfil\1995\96-080.rvc

DRAWING STANDARDS CHECKLIST

SITE PLAN

ITEM		GRAPHIC STANDARDS	OK	NA
SECTION VIII	A	Scale: 1" = 20', 30', 40', or 50'		
	B	Sheet size: 24" x 36"		
	C	Primary features consist only of proposed facilities except those related to drainage		
	D	Notation: All non-construction text, and also construction notation for all primary features		
	E	Line weights of existing and proposed (secondary and primary) features per City standards		
	F	Location: All primary facilities are fully located horizontally (See Comment 1)		
	I	Orientation and north arrow		
	J	Stamped and sealed drawings by registered professional competent in the work		
	K	Title block with names, titles, preparation and revision dates		
	L	Reference to City Standard Drawings and Specifications		
	M	Legend of symbols used		
	N	List of abbreviations used		
	P	Multiple sheets provided with overall graphical key and match lines		
	R	Neatness and legibility		

ITEM	FEATURES	OK	NA
1	Site boundary, and adjacent property lines, land use, and zoning		
2	Total site acreage and proposed land use breakdown		
3	All existing and proposed easements, streets, and ROWs		
4	Identify utility vendors to the site		
5	Identify existing and proposed utilities, including fire hydrants, meters, and service taps		
6	Show existing and proposed drainage inlets, pipes, channels, and manholes		
7	Top and toe of slopes for retention/detention basins or other embankments		
8	Traffic ingress, egress, traffic flow patterns, and traffic control features		
9	All paving and concrete walks, pads, ramps, wheel chocks		
10	Building footprint, roof line, exterior doorways, and roof drain location		
11	Parking areas, striping, stalls, lighting		
12	Areas to receive gravel		
13	Signage, trash collection areas, bike racks and paths, crosswalks, fire lanes		
14	Miscellaneous structures, fences, walls		
15	Other non-landscaping surface facilities		
16	Do not show existing or proposed contours		
17	For perimeter streets, show roadway width from curb to curb or edge of pavement to edge of pavement, ROW width, and the monument or section line.		
18	When applicable, identify the maximum delivery or service truck size and turning radius, hours of anticipated deliveries, and show truck turning radii on the plan to show adequacy of entry/exit and on-site design.		
19	Identify trash dumpster type, anticipated pick-up time, and accessibility		
20	Space for signature approval by City Engineering with date and title		
21	Space for signature of County Clerk and Recorder (when required)		

COMMENTS

1. All angle, curvature, tangency, grade break and change, and other primary features must be fully located horizontally. However, these may be identified on the Grading an Drainage Plan, or may be put on a separate "Staking Plan"
2. If the scale is 1" = 10' or 20', instead of preparing a separate Landscaping Plan, that information may be provided hereon if it will not be too cluttered and confusing. Also, add space for signature approval by Community Development with date and title.

DRAWING STANDARDS CHECKLIST

COVER SHEET

	ITEM	GRAPHIC STANDARDS	OK	NA
SECTION VIII	B	Sheet size: 24" x 36"		
	R	Neatness and legibility		

	ITEM	FEATURES	OK	NA
PROJECT INFORMATION	1	Name of project		
	2	Vicinity Map per IX-33		
	3	Sheet Index		
	4	Signature approval block for City Engineer, Utilities, Engineer, and applicable districts		
	5	Name, address, and telephone number of developer and preparer of plans		
	6	Space for approval signature by City Engineering with date and title		

COMMENTS

DRAWING STANDARDS CHECKLIST

VICINITY MAP

	ITEM	GRAPHIC STANDARDS	OK	NA
SECTION VIII	I	Orientation and north arrow		
	R	Neatness and legibility		

	ITEM	FEATURES	OK	NA
	1	Show nearest adjacent east-west and north-south collector or arterial roads		
	2	Show local roads between the site and collector/arterial roads		
	3	Identify site location		

COMMENTS

1. No scale is required
2. Map is used in reports or on other drawings - size map accordingly.

GENERAL PROJECT REPORT FOR ORCHARD LODGE

111 UNIT SENIOR CITIZENS CONGREGATE LIVING FACILITY GRAND JUNCTION, COLORADO

Owner/Developer:	Terra Properties, 11999 San Vicente Blvd., Los Angeles, CA 90049
Consultants:	
Architect:	Space Projects Planning & Design Research 729 High Drive, Laguna Beach, CA 92651 (714) 376-9346
Structural Design:	Gary Daugherty 941 Bluesage Drive, San Marcos, CA 92096 (619) 727-0923
Mechanical/Electrical Engineer:	Southland Energy Consultants 941 Bluesage Drive, San Marcos, CA 92096 (619) 727-0923
Civil Engineers:	Thompson Langford 529 Independence Plaza 25½ Rd Suite B210, Grand Junction, CO (303) 243-6067
Soils Engineer:	Western Colorado Testing 529 25½ Rd. Suite B-101 Grand Junction, CO 81505 (303) 241-7700
Traffic Study:	Lanco Consulting Transportation Engineers Attn: Brendan Kelly 1380 Lawrence St., Suite 1110 Denver, CO
Landscape Architect:	The Office of William Rabben 27 Chickadee Road Aliso Viejo, CA (714) 420-0230

Services

Fire Department:	City of Grand Junction (303) 244-1414
Health Dept.:	City of Grand Junction (303) 248-6960
Building Dept.:	Mesa County Dept. of Bldg & Safety (970) 244-1631
Sewer & Water:	Fruitvale Sanitation District (303) 243-1494
Utilities: Gas & Electric	Public Services Co. of Colorado (303) 294-2226
Irrigation Water:	Grand Valley Irrigation Co. (303) 242-2762
Building Code References:	1994 UBC - UPC - UMC: 1990 NEC
Building Occupancy:	R-1
Type of Construction:	VNR & V-1HR
Total Building Square Footage:	95,650

GENERAL REPORT

Orchard Lodge is an 111-Unit Congregate Living Facility for rent to Senior Citizen retirees, located in the city of Grand Junction, Colorado.

The building site is approximately 7.06 acres with 1111 feet of frontage on the ~~East~~ West side of 28¼ road between Patterson and Orchard Street.

It is bounded on the South by a 2 single family residential properties. On the North by a vacant lot, on the West by the Princess Subdivision an existing single family detached residential development approximately 15 years old, and on the East directly across 28¼ Road by an existing 2-story rental apartment development approximately 10 years old. The site is intersected on the Northeast by a portion of the Grand Valley Canal easement, rendering the Northerly 262 ft. of property unused and open.

The topography starts at a high point at the service road of this drainage canal and begins to drop approximately 22 ft. in the first 90 feet to the South. It falls approximately 3/6% toward the Southwest corner of the property. This point is considered the appropriate point to exist the storm drainage by a storm drain easement through the Southerly adjacent property to the City storm drain collector in Orchard Street. A detention basis is designed to detain water on the Southern 60 feet of property in 100 year storm condition.

Sixty eight parking spaces are provided on site for residents who may drive, visitors and staff members. The main vehicular access in and out is off 28¼ Road directly on axis with the primary entrance to the existing apartment projects across 28¼ Road. We are also including a secondary egress only gated access Southerly of the main entrance for moving vans and emergency vehicles when needed. This gate will be controlled from the manager's office. The primary vehicular entrance is designed to function as a plaza with enriched paving and planting elements to pick up and drop off residents, access for building services and visitors/guests. Appropriate outdoor seating and walking areas have been incorporated into the roofed public entrance.

The paved driveway completely encircles the building for emergency and service vehicle access as well as equally distributed parking clusters for guest, staff, and resident parking.

The building pad has been raised through cut and fill grading procedure approximately 18/24" above the existing natural grade to allow for appropriate site drainage and utility flow.

A private residents entrance has been incorporated into the North end of this plan, to support the residential character of the lodge and create a sense of autonomy for the residents. Both public and private entries have been designed around the status and character of a large private estate as opposed to the typical single hotel/lobby imagery found in most ~~facilitatles~~ of this type.

The lodge is comprised of 109 resident units, 1 manager's unit and one assistant manager's unit. There are 6 different unit types for residents with the following criteria:

Unit A	- 1 BR/1 BA	- 585 SF
Unit B	- Studio/Bath	- 500 SF
Unit C	- 2 BR/1 BA	- 598 SF
Unit D	- 2BR/2BA	- 702 SF
Unit E	- 2BR/2BA Mgrs Unit - 1013 SF	
Unit F	- 2BR/2BA Deluxe Penthouse Units - 1300 SF	

The individual units are designed with minimal kitchen/dining facilities to encourage residents to enjoy the common dining and lounge areas and a full commercial kitchen to provide full meal and ~~small~~ services to assure integrated community activities and social interaction at Orchard Lodge. The lodge is equipped with an indoor swimming pool in a skylit garden room with adjacent exercise areas and restroom/dressing rooms for residents using these facilities. The plan features outdoor pedestrian shade gardens intersecting the North and South wings with a 4,000 SF central courtyard open to the sky surrounded by the inner pool garden room on the East, residential living units on the North and South and main dining areas and public lounges on the West. The central courtyard will be the hub of outdoor social activities.

The main dining area opens to a private outdoor dining terrace framed by vine covered shade trellises at the front of the property adjacent to 28¼ Road. The private dining terrace sits approximately 10 ft. below the 28¼ Road street level facing landscaped sloped banks to minimize traffic noise.

Orchard Lodge will be within 10 minutes of downtown Grand Junction for shopping, entertainment health facilities and churches. Bus and van transportation is provided for residents by management as part of the rental fee.

The intention of the architectural imagery is to reflect a low impact residential scale with interior common living areas that represent the character and scale of a large estate home.

The lodge has integrated into its plan a small community bank for residents' use, as well as a general store, beauty barber shop, billiards room, library, reading areas, and a private dining area for residents and their guests. A multi-use classroom will be utilized for visiting community members to provide religious study, general education lectures, entertainment and arts and crafts activities.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

April 23, 1996

Regulatory Branch (199675181)

Mr. Michael Drollinger
City of Grand Junction
Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501

Dear Mr. Drollinger:

We are responding to your request for comment on the Orchard Lodge Congregate Living Facility, for a jurisdictional determination. The property is located within Section 7, Township 1 South, Range 1 East, Mesa County, Colorado.

Based on a site inspection by Mr. Randy Snyder of this office on April 15, 1996, we determined that the property does not contain jurisdictional wetland under Section 404 of the Clean Water Act. Therefore, a Department of the Army permit will not be required.

We have assigned number 199675181 to this determination. Please contact Mr. Randy Snyder and refer to this number if you have any questions regarding this matter at (970) 243-1199 or the address below.

Sincerely,

Ken Jacobson
Chief, Southwestern Colorado
Regulatory Office
402 Rood Avenue, Room 142
Grand Junction, Colorado 81501-2563

Copy Furnished:

Shadowfax Properties Incorporated, 11999 San Vincente Boulevard, Number 440, Los Angeles, California 90049
Mesa County, Post Office Box 20,000, Grand Junction, Colorado 81501

To: Michael Drollinger
From: Hank Masterson
Subject: Orchard Lodge
Date: 4/24/96 Time: 4:30PM

Michael,

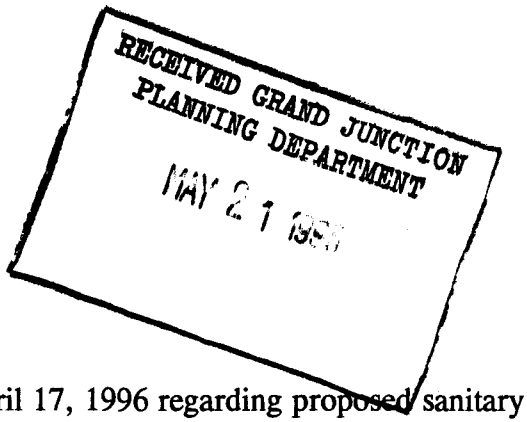
I completed a flow test of hydrants in this area. Available flows were adequate with 2400 gpm available. Required fire flows will be about this amount. Looking at the City water map, the line in 28 1/4 Road is a 6" dead-end fed from a 10" looped line on Orchard. The project should have a looped line feeding it. Frank Warlick, the project manager, seemed willing to loop the line by using an easement extending from the southwest corner of the property to Orchard Avenue. I talked to Trent Prall about this-he doesn't see a problem. Anyway, please add this information to my comments. Thanks.

WestWater Engineering
Consulting Engineers

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

May 20, 1996

Michael Drollinger
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501-1430



RE: Orchard Lodge Congregate Living Facility
File #SPR-96-80

Dear Michael,

In response to our preliminary comments dated April 17, 1996 regarding proposed sanitary sewer service for the Orchard Lodge Congregate Living Facility, the Orchard Lodge Project Manager telephoned our office and explained that we had reviewed and commented on an out-dated set of plans. A revised set of plans dated 4/10/96 was subsequently hand delivered to our office on April 23 by the Orchard Lodge representative to replace the initial submittal.

Because the proposed sanitary sewer service has been significantly revised on the current set of plans, the Fruitvale Sanitation has the following additional comments. The proposed sewer system has been revised to connect to the District's collection system in Orchard Avenue, at a new manhole located between existing manholes at Princess Street and 28 ¼ Road. We assume that the most recent set of plans dated 4/10/96 are the same plans being used by the City and other review agencies.

1. A sewerline profile showing existing ground, finished grade, the sewerline with lengths and slopes between manholes, manholes with rim and invert elevations, and any utilities that cross the new sewerline should be included in the set of plans for all buried sewerlines, from the new manhole in Orchard Avenue to the building connection.

2. It is assumed that all new sewerlines located north of the Orchard Avenue public right-of-way will be considered privately owned, operated and maintained by the Orchard Lodge, similar to the previous plan. The District would own, operate and maintain only the downstream-most segment of sewerline (34.68 feet 8" PVC) and the first two manholes beginning at MH A-1 at the connection to the District's existing sewerline.

3. The District's standard detail sheet should be added to the plans to show requirements for manhole installations and typical trench details. A copy can be made available upon request.

4. The District's standard sanitary sewer notes are required on all submittals. A copy

of the notes is attached for reference.

5. Change the note to clarify requirements for connecting to the existing sewerline in Orchard Avenue at MH A-1. The existing pipe is called out to be removed to place the manhole, and reconnected at inlet and outlet ends of the new manhole, which is not acceptable.

   The Contractor is to excavate to a depth of 14 inches below the flowline of the existing pipe, providing adequate supports at existing pipe joints as necessary to maintain the existing sewerline grade. The Contractor shall place granular bedding material, pour the concrete base of the manhole and complete the manhole as per standard sewer details. This may be completed while the sewerline is flowing sewage. After the base of the manhole has cured, the Contractor can notch out or cut the existing pipe to springline in the east-west direction, and along the north wall of the existing pipe as required to provide a smooth flow channel from the north. The Contractor shall control all live sewage flow and shall not allow debris from the cutting or other work to enter the existing sewer while the work is being conducted.

6. Provide 0.20 foot drop in elevation between the new invert in (north) and the existing invert elevation out (west) at new MH A-1.

7. The second manhole, located behind the existing sidewalk approximately 34 feet north of new MH A-1 is not labeled. The manhole should be labeled on the plan and profile drawings.

8. The unlabeled manhole located approximately 34 feet north of MH A-1 is to be located within the right-of-way of Orchard Avenue. This may require relocating the manhole to the south. It may also require that MH A-1 be located several feet to the west to avoid conflicts with new and existing drainage structures.

9. The unlabeled manhole located approximately 34 feet north of MH A-1 will be the District's monitoring manhole.

10. Provide 0.20 foot drop in elevation between the invert in on the private sewerline (north) and the District's new sewerline (south) at the unlabeled manhole located approximately 34 feet north of MH A-1. In addition, a flat lid slab will be required due to the limited depth from ring and cover elevation and the invert flowline.

11. The segment of sewerline between new MH A-1 and the unlabeled manhole located approximately 34 feet north of MH A-1 will be subject to all standard quality

control testing of the District, including lamping, flowline, mandrel and pressure testing.

Previous comments from the District that have not been addressed in this submittal, yet still apply to the proposed project, are repeated below for continuity.

12. A privately owned, operated and maintained sewer system to serve the facility is acceptable to the District, provided the system is installed to meet District standards for infiltration and inflow. This will include submittal of air test results stamped by a professional engineer for all private sewer mains from the tap at the unlabeled manhole located approximately 34 feet north of MH A-1.

13. The Developer will be required to execute and Extension Application and Extension Agreement with the District.

14. The District will require that plans of the system from the existing sewerline in Orchard Avenue to the building connection be submitted for approval prior to construction, including plan and profile of the sewerline. As-built drawings will also be required for the same segment of pipe upon completion of construction.

15. Sewer tap fees and the monthly user fee will be based on the number of individual units as a minimum. Final determination of tap fees, plant investment fees and monthly user fees will be based on EQU's and will be made jointly by the District and the City of Grand Junction. The District's tap fee will be payable in full upon completion of construction.

16. Additional information is requested in regard to operation of the proposed swimming pool for review. Any proposed discharges from the pool into the sanitary sewer system shall be subject to review and approval.

Other miscellaneous comments regarding the private system design are offered below as suggestions that may minimize future maintenance of the system.

- Provide 0.20 drop in elevation between inlet and outlet piping at all manholes.

- Use a flat lid slab for all manholes less than 5 feet deep in lieu of eccentric cone sections.

- The upstream-most manhole should be a drop manhole with appropriate fittings and drop piping.

Please have the petitioner revise the Plans to address the aforementioned comments and resubmit to the District for approval. Should you have any questions regarding our comments, please do not hesitate to call our office.

Respectfully,

C Kellie Knowles

C. Kellie Knowles, P.E.

cc: Art Crawford, District Manager
Frank Warlick, Project Manager

enclosure

Standard Sanitary Sewer Notes Required for Fruitvale Sanitation District Submittals:

Required Notes. The following notes are required on every sheet of the submittal. Additional notes may be required by the District Engineer for items specific to each sewer line extension.

1. All sewerline construction shall conform to Fruitvale Sanitation District's standards and specifications.

2. All materials and workmanship shall be subject to inspection by the District. The District reserves the right to accept or reject any materials and workmanship that does not conform to its standards and specifications.

3. The Contractor shall have one signed copy of the Plans and a copy of the District's Standards and Specifications at the job site at all times.

4. All sanitary sewer pipe shall be PVC SDR-35 unless otherwise specified. All pipe joints shall be 13 foot joints unless otherwise approved by the District Engineer.

5. All sewer mains shall be laid to grade utilizing a pipe laser.

6. All service line connections to the new main shall be accomplished with full body wyes or tees. Tapping saddles will not be allowed.

7. All trenches shall be compacted to 95% as determined by AASHTO T-99. Contractor shall be required to perform all necessary compaction tests through a certified soils lab.

8. A minimum 10-foot separation shall be maintained at all times between waterlines and sewer lines (except at specified crossings).

9. All sanitary sewer services to be 4" PVC SDR 35 unless otherwise specified.

10. Sewer service stub-outs shall extend 14 feet beyond the property line and shall be glue-capped and marked with a 2x4 post painted green.

11. The Contractor shall notify the District at least 24 hours prior to commencement of construction.

12. No service lines shall be connected directly into manholes.

13. 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 extension.

14. Manholes shall be constructed as shown on the Fruitvale Sanitation District Standard Sanitary Sewer Detail sheet.

Oroba Lodge Congregate Living Facility

Preliminary Estimate

6/4/96

CONSTRUCTION COST ESTIMATE:

Water system:	Units	Quantity	Unit Price	Total Price
1 8" Wet Tap w/saddle and valve	EA	1	3,500.00	3,500
2 6" Wet Tap w/saddle and valve	EA	1	3,000.00	3,000
3 8" Waterline	LF	1550	11.50	17,825
4 6" Waterline	LF	160	10.50	1,680
5 6" Waterline Steel Encasement	LF	50	20.00	1,000
6 Fire Hydrant Assemblies	EA	4	1,400.00	5,600
7 6" Gate Valve and Boxes	EA	6	450.00	2,700
8 8" Gate Valve and Boxes	LS	3	500.00	1,500
9 Miscellaneous fittings	EA	18	175.00	3,150
10 Disturbance and Restoration of 6" "Loop Line" Corridor	LS	1	1,200.00	1,200
	Sub-total Potable Water:			41,155

Sewer system:	Units	Quantity	Unit Price	Total Price
1 8-inch PVC Sewer	LF	305	14.80	4,514
2 Standard Manholes	EA	4	1,650.00	6,600
3 Drop Manhole	EA	1	1,800.00	1,800
4 Sanitary Sewer Plug	EA	1	250.00	250
Sub-total Sanitary Sewer:				13,164

Site grading and paving	Units	Quantity	Unit Price	Total Price
1 Clearing and grubbing	Ac	6.00	650.00	3,900
2 Excavation	CY	6372.00	1.50	9,558
3 Embankment (on-site material)	CY	5683.00	2.00	11,366
4 Embankment (import material)	CY	0.00	9.60	0
5 Concrete Removal & Disposal	SY	123.00	4.50	554
6 Asphalt Removal & Disposal	SY	135.00	3.50	473
7 6" Class-6	CY	944.00	15.00	14,160
8 3" Asphalt	TON	643.00	24.00	15,432
9 2.0' Curb & gutter	LF	393.00	11.50	4,520
10 6" Barrier Curb	LF	1165.00	10.50	12,233
11 6.5' Walk w/Thickened Edge	LF	193.00	18.00	3,474
12 5.5' Walk w/Thickened Edge	LF	232.00	16.00	3,712
13 6.5' Mono Curb/Gutter/Walk	LF	10.00	19.00	190
13 8' Mono Curb/Gutter/Walk	LF	190.00	20.00	3,800
14 4' Concrete Walk	LF	582.00	14.00	8,148
15 5' Concrete Walk	LF	72.00	14.50	1,044
16 5.5' Concrete Walk	LF	22.00	15.00	330
17 6' Concrete Walk	LF	39.00	16.00	624
18 Concrete driveway sections	SY	80.00	32.00	2,560
19 Concrete block retaining wall	FF	250.00	12.50	3,125
20 7'x6" Concrete parking barriers	EA	15.00	50.00	750
21 Pavement/Parking striping	LF	1300.00	0.20	260
22 Concrete Accessible Ramps	SY	95.00	34.00	3,230
23 Concrete Pads	SY	250.00	22.00	5,500

24 "Cast in Place" Drain Swale	SY	3.00	28.00	84
25 1.5' Concrete Deco Stripping	LF	532.00	12.00	6,384
26 Decorative Paving	SY	21.00	36.00	756
Sub-total Site grading and paving:				116,168

Drainage	Units	Quantity	Unit Price	Total Price
1 Detention Pond	Incl. in Excav./Embk.			0
2 Orifice Controled Outlet Works	LS	1.00	1,350.00	1,350
3 Curb Opening Inlets	EA	3.00	1,050.00	3,150
4 12" Area Inlets	EA	10.00	750.00	7,500
5 Grated Surface Inlets	EA	82.00	250.00	20,500
6 Grated shallow MH (Inlet)	EA	3.00	1,100.00	3,300
7 Storm Sewer Shallow MH	EA	2.00	1,100.00	2,200
8 Storm Sewer Standard MH	EA	5.00	1,250.00	6,250
9 6" PVC Storm Sewer	LF	1453.00	8.50	12,351
10 8" PVC Storm Sewer	LF	342.00	10.50	3,591
11 12" PVC Storm Sewer	LF	850.00	13.50	11,475
12 18" PVC Storm Sewer	LF	127.00	19.00	2,413
13 21" PVC Storm Sewer	LF	217.00	25.00	5,425
14 21" RCP Storm Sewer	LF	146.00	32.00	4,672
15 24" RCP Storm Sewer	LF	180.00	42.00	7,560
16 12" RCP Flared End Sec. w/Riprap	EA	1.00	250.00	250
17 21" RCP Flared End Sec. w/Riprap	EA	1.00	350.00	350
18 Remove and Reset Shed	LS	1.00	250.00	250
19 Remove and Reset Conc. Planters	EA	2.00	75.00	150
20 Remove & Dispose Existing Culv.	LF	98.00	2.00	196
21 Remove and reloc. board fence	LF	220.00	6.00	1,320
22 Remove and reloc. 4' chainlink fence	LF	140.00	4.00	560
23 Relandscaping in kind	LS	1.00	3,000.00	3,000
24 Util. Pedistal Adj. for new fence	EA	5.00	450.00	2,250
25 Remove & replace CG&SW	LF	10.00	30.00	300
Sub-total Drainage:				100,362

Total Construction Costs: 270,847

OK

Date: June 6, 1996 FAX: 970-244-1599

To: Mr. Michael Drollinger, Senior Planner
Grand Junction City Planning Department
250 North Street
Grand Junction, Colorado 81501-2668

DRAFT

From: William Rabben, ASLA
OWR Landscape Architecture Urban Design Planning
23 Chickadee
Aliso Viejo, Ca. 92656

Project: Orchard Lodge, Grand Junction, Colorado

Reference: Reduction in Required Parking from (72) spaces to (70) spaces

---

Dear Michael:

In response to our most recent conversation, It is my understanding that a variance in the total number of required parking spaces may be possible if Ownership can provide the following additional data:

1.0 Information that shows that resident car ownership levels for this project are less than those determined in the calculation for the city parking code.

2.0 Is there, or can there be, any provision for a shuttle service for the project that may impact required parking counts?

In addition, The current plans showing (68) total spaces will accommodate (70) parking spaces if the (3) extra handicap spaces provided adjacent to the resident entry on the current plans are converted to standard spaces. This adjustment can be made by simply changing the striping in this area to indicate regular spaces in lieu of handicap spaces.

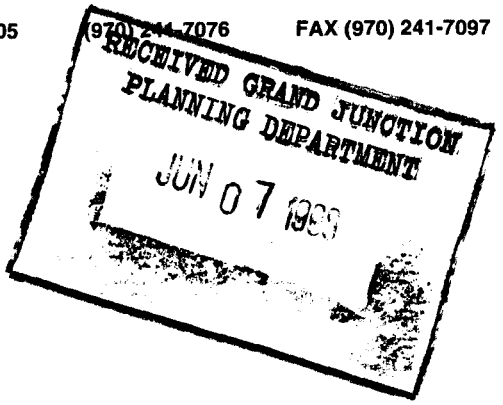
Based on this information, it is our understanding that you have agreed to allow the plans to be resubmitted in their current state, as long as the additional data mentioned above is provided to you prior to completing your plan check process on the resubmitted plans.

It is also our understanding, that if the forthcoming data is not conclusive or not sufficient to grant this variance, the applicant will be allowed to submit a supplemental plan indicating proposed location for the (2) additional parking spaces required to fulfill the original parking requirement of (72) spaces.
Thank you for your coorporation.

Sincerely, William Rabben

WestWater Engineering
Consulting Engineers

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



June 6, 1996

Michael Drollinger
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501-1430

RE: Orchard Lodge Congregate Living Facility
File #SPR-96-80
Fruitvale Sanitation District Comments

Dear Michael,

Our office is in receipt of a third submittal for the Orchard Lodge Congregate Living Facility along with fully executed Sewer Extension Application and Agreements that are required by the District. It has also been confirmed that the portion of the proposed sanitary sewer located north of the right-of-way of Orchard Avenue will be a privately owned and maintained sewer system that provides service to a public community of 111 residential units. The District will own, operate and maintain the portion of the sewer system within the right-of-way of Orchard Avenue.

It would appear that our comments listed in a letter dated May 20, 1996 have not been addressed on this recent submittal with the exceptions of comments #2, 9 and 13 as identified above. The remaining comments continue to apply to the proposed development.

A portion of the proposed sanitary sewer system includes connection to the District's existing sewerline with a new manhole, extension of a new District sewer main and installation of a second manhole that will be used for monitoring discharges from Orchard Lodge. The two manholes and new sewerline will be the District's responsibility for operation and maintenance. For these reasons, the District's standards will need to be met. In addition, the District requires specifying proper control of live sewage that will be necessary in order to construct MH A-1 on the existing sewer main as well as detailing how MH A-1 is to be constructed. Standards for engineering design and construction of any sewer extension within the District apply to all projects regardless of the amount of work involved.

Although the majority of the proposed sanitary sewer system is to be privately owned and maintained, it serves the public. According to the General Project Report for Orchard Lodge, the private sewer system will provide service to 109 individual residential units, one manager's unit and one assistant manager's unit as well as a full commercial kitchen, an indoor swimming pool, a small community bank, general store, beauty/barber shop and other amenities.

The proposed private sewer system that provides service to such a community is required to meet State Health Department criteria for public sewers. These are the same standards as the District uses in their criteria for public sewers and was the basis for our May 20 comments regarding the proposed private system.

Please have the petitioner address our comments from May 20 and resubmit revised Plans to the District for approval. If you do not have a copy of our May 20 letter, or if you have any questions or comments, do not hesitate to call our office.

Respectfully,

C. Kellie Knowles, P.E.

cc: Art Crawford, District Manager
Frank Warlick, Project Manager
Jim Langford, Thompson-Langford Corp.
Dwain Watson, Colorado Department of Health

WESTERN
COLORADO
TESTING,
INC.

REPORT OF GEOTECHNICAL INVESTIGATION FOR A PROPOSED MULTI FAMILY HOUSING PROJECT 5.78 ± ACRES BEGINNING 150' NORTH OF ORCHARD AVENUE WEST SIDE OF 28 1/4 ROAD GRAND JUNCTION, COLORADO

Prepared For:

Shadowfax
c/o Terra Properties
Attention: Julie Gilbert
11999 San Vincente Blvd., #440
Los Angeles, CA 90049

Prepared by:

Western Colorado Testing, Inc.
529 25 1/2 Road, Suite B101
Grand Junction, Colorado 81505
(303) 241-7700

June 14, 1994
Job No. 202894

TABLE OF CONTENTS

INTRODUCTION

This report presents the results of the geotechnical investigation performed at the site of a 5.78 ± acres (90 unit) proposed multi - family housing project to be located, beginning 150' North of Orchard Avenue, extending north along west side of 28 1/4 Road, Grand Junction, Colorado. This investigation was authorized by Mr. Arthur Pastel on May 24, 1994.

Included in this investigation were test borings and a report of our conclusions and recommendations. The scope of our report was limited to the following:

- Evaluating the engineering properties of the subsoils encountered.
- Recommending types and depths of foundation elements.
- Evaluating soil bearing capacity and estimated settlement.
- Presenting recommendations for earthwork and soils related construction with respect to the subsoils encountered.

This report was prepared by the firm of Western Colorado Testing, Inc. (**WCT**) under the supervision of a professional engineer registered in the state of Colorado. Recommendations are based on the applicable standards of the profession at the time of this report within this geographic area. This report has been prepared for the exclusive use of **Shadowfax c/o Terra Properties,** for the specific application to the proposed project in accordance with generally accepted geotechnical engineering practices.

The scope of this investigation did not include any environmental assessment for the presence of hazardous or toxic

materials in the soil or groundwater on or near this site. If contamination is a concern, it is recommended an environmental assessment be performed.

SITE CONDITIONS

The site is currently vacant with a ground coverage of native grasses and some scattered trees. The site slopes to the south, southwest with approximately 10 to 12 feet of elevation differential between borings. With the elevation differential the building will need to be stepped down the slope. Along the north side is the Grand Valley Canal. The site is bordered on the east by 28 1/4 Road followed by multi-family housing, on the south by multi-family housing followed by Orchard Avenue and on the west by single family residential housing. The site will need to be graded to provide good surface drainage around and away from the proposed structure.

PROPOSED CONSTRUCTION

The proposed structure is planned to be a single story building with a center court yard. It is our understanding construction will be conventional wood framing with a reinforced concrete foundation and with a slab-on-grade floor. Wall foundation loads are anticipated to be on the order of 1 to 2 kips per lineal foot.

FIELD EXPLORATION

The field investigation was conducted on May 27, 1994. The exploratory program consisted of four (4) soil borings as shown on the Boring Location Plan (Appendix, Figure 1). Borings were located in the field by taping distances from features shown on the boring location plan. Elevations of the borings were determined with a hand level. The location and elevation of the

borings should be considered accurate only to the degree implied by the method used.

Test borings were advanced to depths of approximately 21 1/2 feet with a truck mounted CME 75 soil sampling rig using four inch continuous flight augers. Borings remained open during drilling, and stabilization drilling methods were not required within the depths investigated.

Soil samples were obtained at the sampling intervals shown on the Boring Logs (Appendix, Figures 2 through 5). Recovered samples were extracted in the field, sealed in plastic or brass containers, labeled and protected for transportation to the laboratory for testing. Dames and Moore ring barrel and split barrel samples were obtained while performing Standard Penetration Tests (SPT) driven in general accordance with ASTM D-1586, "Penetration Test and Split Barrel Sampling of Soils". The N-Value, reported in blows per foot, equals the number of blows required to drive the sampler over the last 12 inches of the sample interval.

Stratification lines represent the approximate boundary between soil types, and the transition may be gradual.

LABORATORY TESTING

The field boring logs were reviewed to outline the depths, thicknesses, and extent of the soil strata, and a testing program was established to evaluate the engineering properties of the recovered samples. Specific tests that were performed include moisture contents, density determinations, particle size analysis, Atterberg limits, swell-consolidation tests and a soluble sulfates test. These tests were performed in general accordance with current ASTM or state-of-the-art test

procedures. The test results are presented on Figures 6 through 10.

Based on the results of this testing program the field logs were reviewed and supplemented as presented in the Appendix, Figures 2 through 5. These final logs represent our interpretation of the field logs, and reflect the additional information gained in the laboratory testing program.

SUBSURFACE CONDITIONS

As shown on the boring logs, Appendix, Figures 2 through 5, the subsurface conditions encountered at the site are fairly uniform. Generally, the soils encountered in the borings consisted of clay, very silty, slightly sandy over a sandy clay to clayey sand layer and followed by a silty clay. Water was not encountered in any of the borings during drilling.

The upper material was slightly sandy, very silty clay which was dry and brown in color. Penetration tests indicate the clay is medium stiff to stiff. Following the upper, slightly sandy, very silty clay at a depth of 2 1/2 to 8 feet was a clayey sand to sandy clay which was dry to slightly moist and brown in color. Penetration tests indicate the clayey sand to sandy clay is loose to medium dense or stiff to very stiff. The sandy material extended to depths ranging from 6 to 16 feet and was overlying a silty to very silty clay which was slightly moist to moist becoming more moist with depth and brown in color. Penetration tests indicate the silty to very silty clay is stiff to very stiff becoming stiff at a depth of approximately 17 feet and in test hole 2 becoming soft at 20 feet. The silty to very silty clay extended to the maximum depth explored 21 1/2 feet.

CONCLUSIONS AND RECOMMENDATIONS

In general, this site is considered suitable for the proposed construction. The subsoils encountered at the anticipated depth of foundations are generally capable of supporting the anticipated loads, with some modification and within the design parameters discussed as follows.

FOUNDATION ANALYSIS

The soils encountered are stiff to very stiff and appear to have good bearing pressure when dry, however when wetted these soils possess collapsible characteristics. Thus, when watering of lawns and landscaping begins settlement on the order of 2 1/2 inches is possible and can structurally damage the building. To reduce the risk of foundation movement all soils encountered within 3 feet of the bottom of the footings should be removed and replaced with non-expansive structural fill. The existing soils can be used as structural fill, however it should be noted soils with high silt contents are very moisture sensitive and are sometimes difficult to work with. Following placement and compaction of the structural fill the structure can be supported on a conventional spread footing foundation system.

The following design and construction details should be observed for a spread footing foundation system.

- All soils encountered within three (3) feet of the bottom of the footings should be removed and replaced with structural fill.

- Structural fill placed for support of footings should consist of a granular, non-expansive material compacted to a minimum 95% of the maximum Standard Proctor density (ASTM D-698) at a moisture content (-) 2% to (+) 3% of optimum. Structural fill should

extend down from the bottom of the footings at a one horizontal to one vertical projection.

- Footings placed on the new structural fill should be designed for an allowable soil bearing pressure of 2000 pounds per square foot. Footings should be proportioned as much as practicable to minimize differential settlement.

- We estimate total settlement for footings designed and constructed as discussed in this section will be approximately one inch, which is generally considered acceptable and was used in our analysis.

- Footings should have a minimum width of 18 inches.

- Exterior footings and footings in unheated areas should extend to below the frost depth. The local building codes should be consulted, however we would recommend a minimum depth of 24 inches.

- Continuous foundation walls should be reinforced top and bottom to span an unsupported length of at least twelve (12) feet. A sulfate resistant concrete should be used for all concrete that will come into contact with the on site soils.

- All loose or disturbed material encountered at the foundation bearing level should be removed and replaced with new structural fill. The surface of the existing soils should be moisture conditioned and compacted prior to placement of any structural fill.

- A representative of the geotechnical engineer should observe all foundation excavations prior to the placement of fill and concrete.

LATERAL EARTH PRESSURES

Foundation walls are normally designed to be fairly rigid (unyielding), and should therefor be designed for "at rest" lateral soil pressures. Backfill consisting of the existing natural soils should be designed to resist an "at rest" (k_0) lateral earth pressure corresponding to an equivalent fluid pressure (EFP) of at least 55 pounds per cubic foot. Walls which are separate from structures and can rotate sufficiently to develop active conditions can be designed to resist a lateral earth pressure corresponding to an equivalent fluid pressure of 45 pcf. These lateral earth pressures do not include sloped backfill, surcharge loads or hydrostatic pressures.

Water Soluble Sulfates

A sample of the on site soils from test boring Th-2 at a depth of 3 to 4 1/2 feet was tested to determine the concentration of water soluble sulfates. The test results indicate a sulfate content at 50 ppm. This concentration of water soluble sulfates represents a negligible exposure. However, since most of the valley soils indicate moderate to severe exposure of which some may be used as fill materials, we would recommend a sulfate resistant cement, type II for all concrete exposed to the on site or imported soils.

FLOOR SLABS

It is unknown whether floor slabs or crawl spaces will be used for the structure. Slab-on-grade construction presents a problem where collapsible materials are present near floor slab elevation because watering of landscape or improper grading can

cause fluctuations in moisture contents which in turn can create movement of the soils.

The following construction details will help mitigate slab movement and should be observed for slab-on-grade construction.

- Floor slabs should be separated from all bearing walls, columns and utility lines with an expansion joint which allows unrestrained vertical movement.

- Floor slabs should be provided with control joints to reduce damage due to shrinkage cracking.

- The top 18 to 24 inches of soils should be moisture conditioned to near optimum and recompacted to a minimum 95% of ASTM D-698.

- The risk of slab movement could be further reduced by removing additional material below the slabs and replacing it with structural fill.

- All fill placed below the slabs should consist of non-expansive, granular material compacted to at least 95 percent of the maximum standard Proctor density at a moisture content near optimum.

PERIMETER DRAIN SYSTEM

Water was not encountered in the borings however, it has been our experience that local perched water table conditions can develop after construction. The source of water could be from excessive irrigation and poor surface drainage accumulating in backfill areas, with subsequent seepage to foundation depth. For this reason and the fact the soils are moisture sensitive a drain system should be provided around exterior foundation walls. The perimeter drain system should be placed at or below the footing level and typically consist of a perforated 4 inch

diameter drain pipe surrounded by at least one pipe diameter of free draining gravel. The gravel should extend to the top of the footing or above and should be completely wrapped in a filter fabric. The drain lines should be graded to daylight or to a sump where the water can be removed by pumping. A minimum slope of 1 percent should be used for all drain pipe. The gravel used in the drain system should be minus 2 inch material having less than 20 percent passing the No. 4 sieve and less than 5 percent passing the No. 200 sieve.

SURFACE DRAINAGE AND LANDSCAPING

The success of shallow foundation and slab-on-grade systems is contingent upon keeping the subgrade soils at a more or less constant moisture content, and by not allowing surface drainage a path to the subsurface. Positive surface drainage away from structures must be maintained at all times. Landscaped areas should be designed and built such that irrigation and other surface water will be collected and carried away from foundation elements.

The final grade of the foundation backfill and any overlying concrete slabs or sidewalks should have a positive slope away from foundation walls on all sides. We recommend a minimum slope of 8 inches in the first 10 feet; however, the slope can be decreased if the ground surface adjacent to foundations is covered with concrete slabs or sidewalks.

Backfill material should be placed near optimum moisture content and compacted to at least 90% of maximum standard Proctor density in landscaped areas and to at least 95% maximum standard Proctor density beneath structural areas (sidewalks, patios, driveways, etc.). All roof downspouts and faucets should discharge well beyond the limits of all backfill. Irrigation within ten (10) feet of the foundation should be carefully controlled and minimized.

GENERAL

In the event that any changes in the nature, design, or location of the structure are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analysis and recommendations submitted in this report are based in part upon the data obtained from the four (4) soil borings. The nature and extent of variation between the borings may not become evident until construction. If variations then appear, it will be necessary to reevaluate the recommendations in this report.

It is recommended that the geotechnical engineer be provided the opportunity for general review of the final designs and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the designs and specifications. It is also recommended that the geotechnical engineer be retained to provide continuous engineering services during construction of the foundations, excavations, and earthwork phases of the work. This is to observe compliance with the design concepts, specifications, or recommendations and to modify these recommendations in the event that subsurface conditions differ from those anticipated.

Respectfully Submitted,
WESTERN COLORADO TESTING, INC.

Gary L. Hamacher, P.E.
Senior Geotechnical Engineer
GLH/rr

APPENDIX

WESTERN COLORADO TESTING, INC.

Job No. 202894
Date 6/14/94
Project Multi-Family Housing
Location Grand Junction, Colorado

BORING LOCATION PLAN

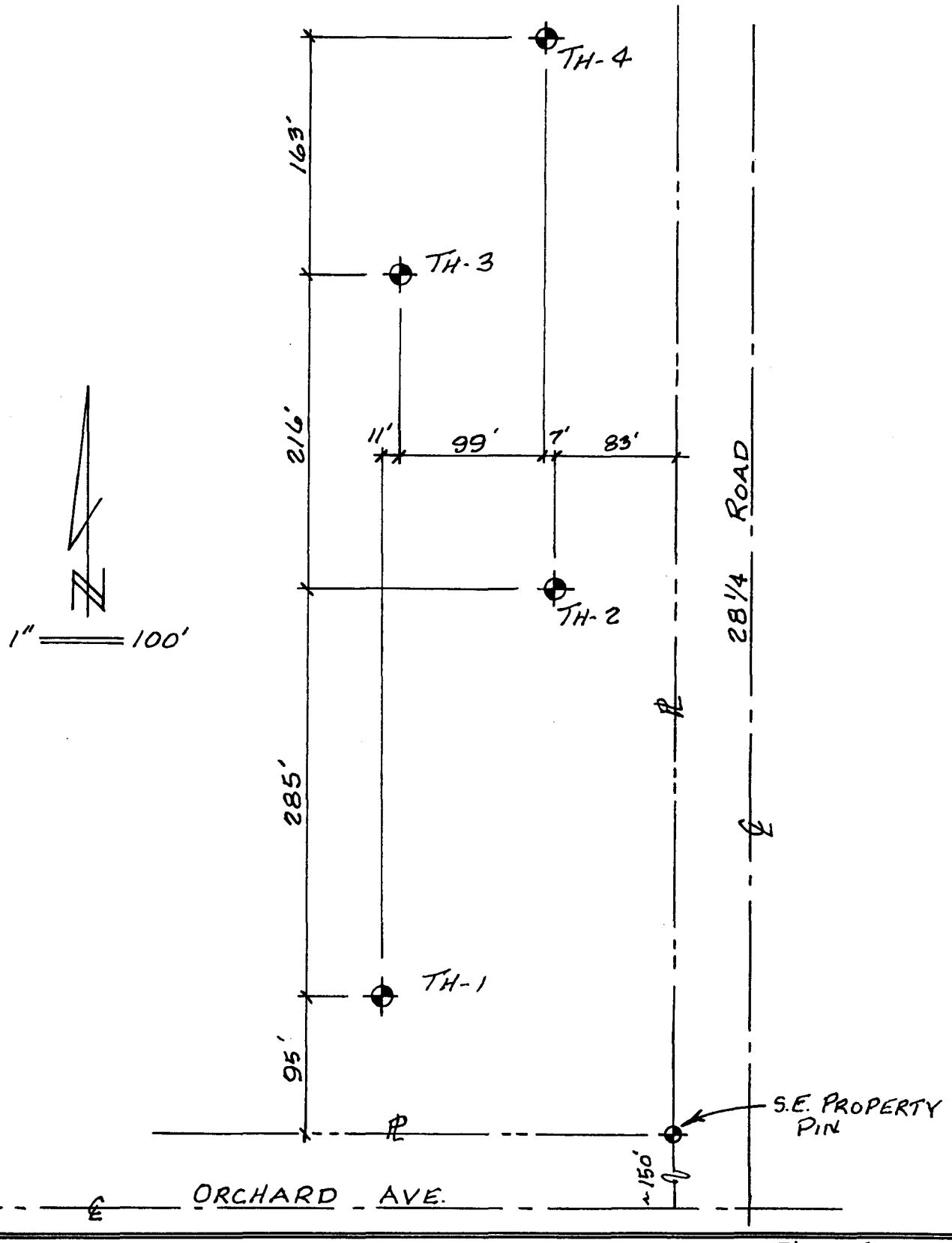


Figure 1

WESTERN COLORADO TESTING, INC.

Project Multi - Family Housing
Location Grand Junction, Colorado
Job No 202894 Date 5/27/94

BORING LOG

DRILL HOLE NO.	LOCATION OF DRILL HOLE	ELEVATION	DATUM	DRILLER	LOGGER
TH-1	See Boring Location Plan	-	-	D. Smith	G. Hamacher

WATER LEVEL OBSERVATIONS				TYPE OF SURFACE	DRILL RIG
				Native Grasses	CME-75
WHILE DRILLING	END OF DRILLING	24 HOURS AFTER DRILLING	20 DAYS	DRILLING METHOD	TOTAL DEPTH
None			None	4" Cont. Flight Auger	21 1/2'

DEP. FT	SAMPLE DATA			SOIL DESCRIPTION				LABORATORY DATA				DEP. FT
	SAMPLE NO. & TYPE	"N" BLOWS /FT	% REC.	COLOR	MOIST	CONS.	GEOLOGIC DESCRIPTION & OTHER REMARKS	% MC	DRY DENS pcf	qu tsf	CLASS	
				brown	dry	medium stiff to stiff	CLAY, very silty slightly sandy					
	D-1	9	100					5.0	87.5		LL=27 PI=10 CL	
5												5
	SP-1	15	95				sandy at 7 1/2'	4.6				
10												10
	D-2	17	100			stiff to very stiff		6.3	93.5			
15												15
				brown	moist	stiff	CLAY, silty					
20												20
	SP-2	10	100									
							B.O.H at 21 1/2'					
25												25

Figure 2

WESTERN COLORADO TESTING, INC.

Project Multi-Family Housing

Location Grand Junction, Colorado

Job No 202894 Date 5/27/94

BORING LOG

DRILL HOLE NO.	LOCATION OF DRILL HOLE	ELEVATION	DATUM	DRILLER	LOGGER
TH-2	See Boring Location Plan	-	-	D. Smith	G. Hamacher

WATER LEVEL OBSERVATIONS				TYPE OF SURFACE	DRILL RIG
				Native Grasses	CME-75
WHILE DRILLING	END OF DRILLING	24 HOURS AFTER DRILLING	20 DAYS	DRILLING METHOD	TOTAL DEPTH
None			None	4" Cont. Flight Auger	21'

DEP. FT	SAMPLE DATA			SOIL DESCRIPTION				LABORATORY DATA				DEP. FT
	SAMPLE NO. & TYPE	"N" BLOWS /FT	% REC.	COLOR	MOIST	CONS.	GEOLOGIC DESCRIPTION & OTHER REMARKS	% MC	DRY DENS pcf	qu tsf	CLASS	
				brown	dry	medium stiff	CLAY, very silty, slightly sandy					
	SP-1	6	100					5.1				
5												5
	D-1	16	100	brown	dry to slightly moist	medium dense	SAND, fine to coarse grained, clayey and silty, some sandstone pieces	3.6	102.2			
10												10
	SP-2	12	100									
15				brown	slightly moist to moist	stiff	CLAY, silty and sandy					15
					moist	medium stiff						
20	SP-3	2	60		very moist	soft						20
							B.O.H. at 21'					
25												25

Figure 3

WESTERN COLORADO TESTING, INC.

Project Multi - Family Housing
Location Grand Junction, Colorado
Job No 202894 Date 5/27/94

BORING LOG

DRILL HOLE NO.	LOCATION OF DRILL HOLE	ELEVATION	DATUM	DRILLER	LOGGER
TH-3	See Boring Location Plan	-	-	D. Smith	G. Hamacher

WATER LEVEL OBSERVATIONS				TYPE OF SURFACE	DRILL RIG
				Native Grasses	CME-75
WHILE DRILLING	END OF DRILLING	24 HOURS AFTER DRILLING	20 DAYS	DRILLING METHOD	TOTAL DEPTH
None			None	4" Cont. Flight Augers	21 1/2'

DEP. FT	SAMPLE DATA: SAMPLE NO. & TYPE	"N" BLOWS /FT	% REC.	SOIL DESCRIPTION: COLOR	MOIST	CONS.	GEOLOGIC DESCRIPTION & OTHER REMARKS	LABORATORY DATA: % MC	DRY DENS pcf	qu tsf	CLASS	DEP. FT
				brown	dry	medium stiff	CLAY, very silty, slightly sandy					
	D-1	12	100	brown	dry to slightly moist	loose to medium dense	SAND, fine to coarse grained, clayey to clay, sandy some sandstone pieces	6.1	90.3		LL=28 PI=11 SC	
5						medium dense						5
	SP-1	15	95									
10				brown	dry to slightly moist	stiff to very stiff	CLAY silty to very silty, slightly sandy, calcareous					10
	SP-2	17	100					5.7				
15					moist	stiff						15
20	SP-3	13	100									20
							B.O.H. at 21 1/2'					
25												25

Figure 4

WESTERN COLORADO TESTING, INC.

Project Multi - Family Housing

Location Grand Junction, Colorado

Job No 202894 Date 5/27/94

BORING LOG

DRILL HOLE NO.	LOCATION OF DRILL HOLE	ELEVATION	DATUM	DRILLER	LOGGER
TH-4	See Boring Location Plan	-	-	R. Lancaster	G. Hamacher

WATER LEVEL OBSERVATIONS				TYPE OF SURFACE	DRILL RIG
				Native Grasses	CME-75
WHILE DRILLING	END OF DRILLING	24 HOURS AFTER DRILLING	20 DAYS	DRILLING METHOD	TOTAL DEPTH
None			None	4" Cont. Flight Auger	21 1/2'

DEP. FT	SAMPLE DATA			SOIL DESCRIPTION				LABORATORY DATA				DEP. FT
	SAMPLE NO. & TYPE	"N" BLOWS /FT	% REC.	COLOR	MOIST	CONS.	GEOLOGIC DESCRIPTION & OTHER REMARKS	% MC	DRY DENS pcf	qu tsf	CLASS	
				light brown	dry	medium stiff	CLAY, very silty, sandy					
				light brown	dry to slightly moist	medium stiff	CLAY, sandy with sandstone pieces					
	SP-1	8	100			stiff						
5												5
				brown	dry to slightly moist	stiff to very stiff	CLAY, very silty, sandy					
	D-1	19	100									
10												10
	SP-2	17	100									
15												15
					moist	stiff						
20												20
	SP-3	15	100									
							B.O.H. at 21 1/2'					
25												25

Figure 5

WESTERN COLORADO TESTING, INC.
529 25½ Road, Suite B-101
Grand Junction, CO 81505
(303) 241-7700

LABORATORY REPORT

PHYSICAL PROPERTIES OF SOILS

Client: Shadowfax
c/o Terra Properties

Job No. 202894
Lab/Invoice No.
Date 6/14/94
Reviewed By RH

Project: Multi - Family Housing
Location: Grand Junction, Colorado — Sampled By: G. Hamacher — Date: 5/27/94
Type of Material: Clay, silty, some sand — Submitted By: G. Hamacher — Date: 6/1/94
Source of Material: TH-1 2.0'-3.0' — Authorized By: Client — Date: 5/24/94

Sieve Analysis, ASTM D422-

Sieve Size	% Passing Accumulative	Specification
3"		
2½"		
2"		
1½"		
1"		
¾"		
½"		
⅜"		
¼"		
No. 4		
8		
10		
16		
30	100	
40	99	
50	98	
100	96	
Finer than 200 ASTM D1140-	85.6	

Soil Classification: Unified CL

Liquid Limit and Plasticity of Soils ASTM D424- : LL = 27, PI = 10

Moisture - Density Relations ☐ ASTM D698- ; ☐ ASTM D1557- ; Method ____ : Maximum Dry Density, pcf ____ ; Optimum Moisture, % ____

Specific Gravity of Soils (minus No. 4 material) ASTM D854- : Specific Gravity ____

Resistance 'R' Value of Compacted Soils ASTM D2844- : 'R' Value ____

Other:

Natural moisture content 5.0%

Copies to:

Figure 6

WESTERN COLORADO TESTING, INC.
529 25½ Road, Suite B-101
Grand Junction, CO 81505
(303) 241-7700

LABORATORY REPORT

PHYSICAL PROPERTIES OF SOILS

Client: Shadowfax
c/o Terra Properties

Job No. 202894
Lab/Invoice No.
Date 6/14/94
Reviewed By

Project: Muli - Family Housing

Location: Grand Junction, Colorado — Sampled By: G. Hamacher — Date: 5/27/94
Type of Material: Sand, clayey — Submitted By: G. Hamacher — Date: 6/1/94
Source of Material: TH-3 3.0'-4.5' — Authorized By: Client — Date: 5/24/94

Sieve Analysis, ASTM D422-

Sieve Size	% Passing Accumulative	Specification
3"		
2½"		
2"		
1½"		
1"		
¾"		
½"		
⅜"	100	
¼"	-	
No. 4	97	
8	88	
10	86	
16	78	
30	68	
40	65	
50	62	
100	55	
Finer than 200 ASTM D1140-	46.6	

Soil Classification: Unified SC

Liquid Limit and Plasticity of Soils ASTM D424- LL = 28, PI = 11

Moisture - Density Relations ☐ ASTM D698- ; ☐ ASTM D1557- ; Method ____ Maximum Dry Density, pcf ____ Optimum Moisture, % ____

Specific Gravity of Soils (minus No. 4 material) ASTM D854- Specific Gravity ____

Resistance 'R' Value of Compacted Soils ASTM D2844- 'R' Value ____

Other:

Natural moisture content 6.1%

Copies to:

Figure 7

SWELL CONSOLIDATION TEST

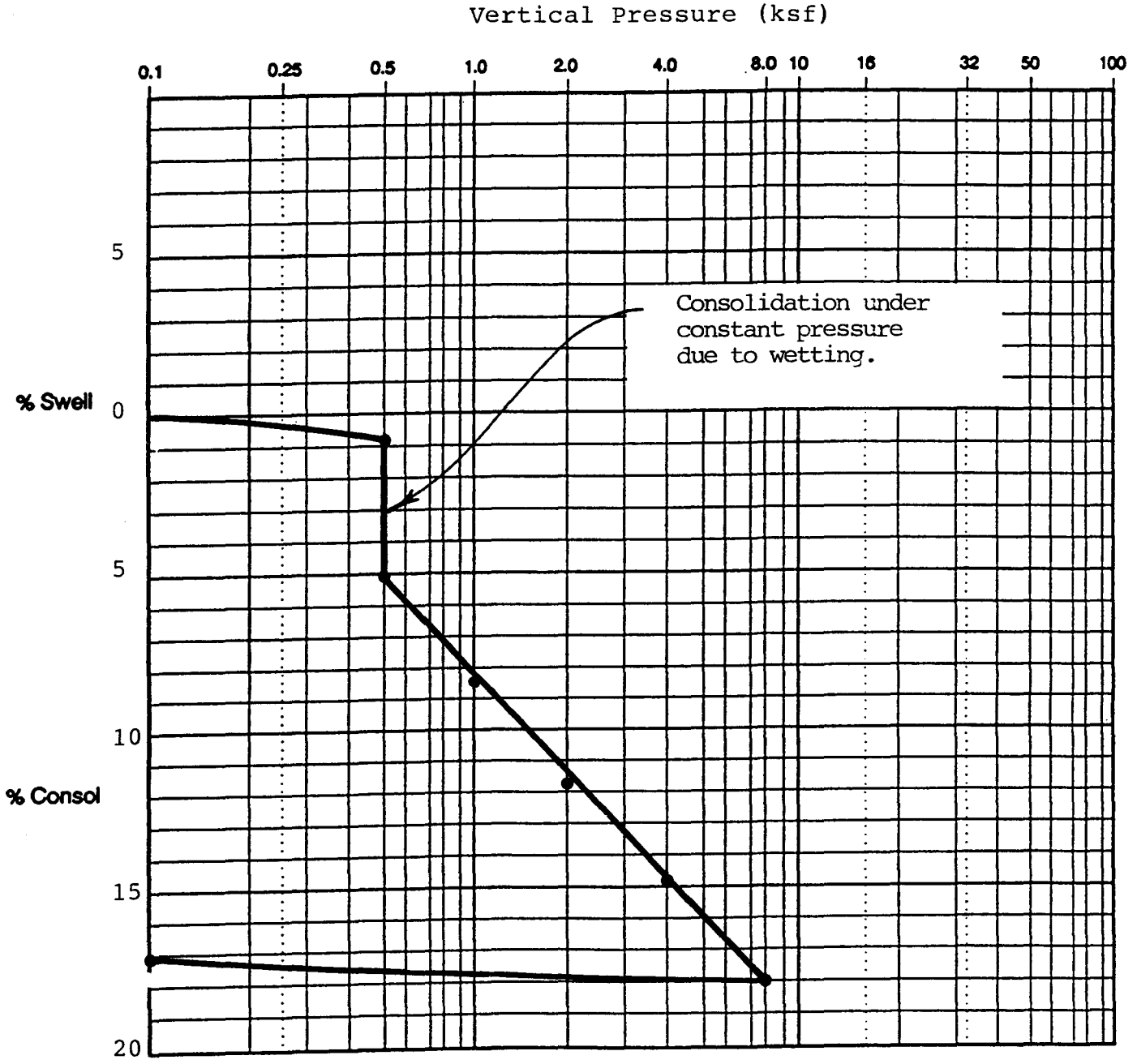
Drill Hole No. TH-1 Sample No. D-1 Sample Depth Interval 2.0'-3.0'

Sample Description Clay, silty, slightly sandy

Initial Water Content 5.0 Dry Unit Weight 87.5 pcf Initial Saturation

Final Water Content 21.0 Specific Gravity ☐ Assumed

Liquid Limit 27 Plastic Limit 17 Plasticity Index 10 Classification CL



WESTERN COLORADO TESTING, INC.
529 25½ Road, Suite B-101
Grand Junction, CO 81505
(303) 241-7700

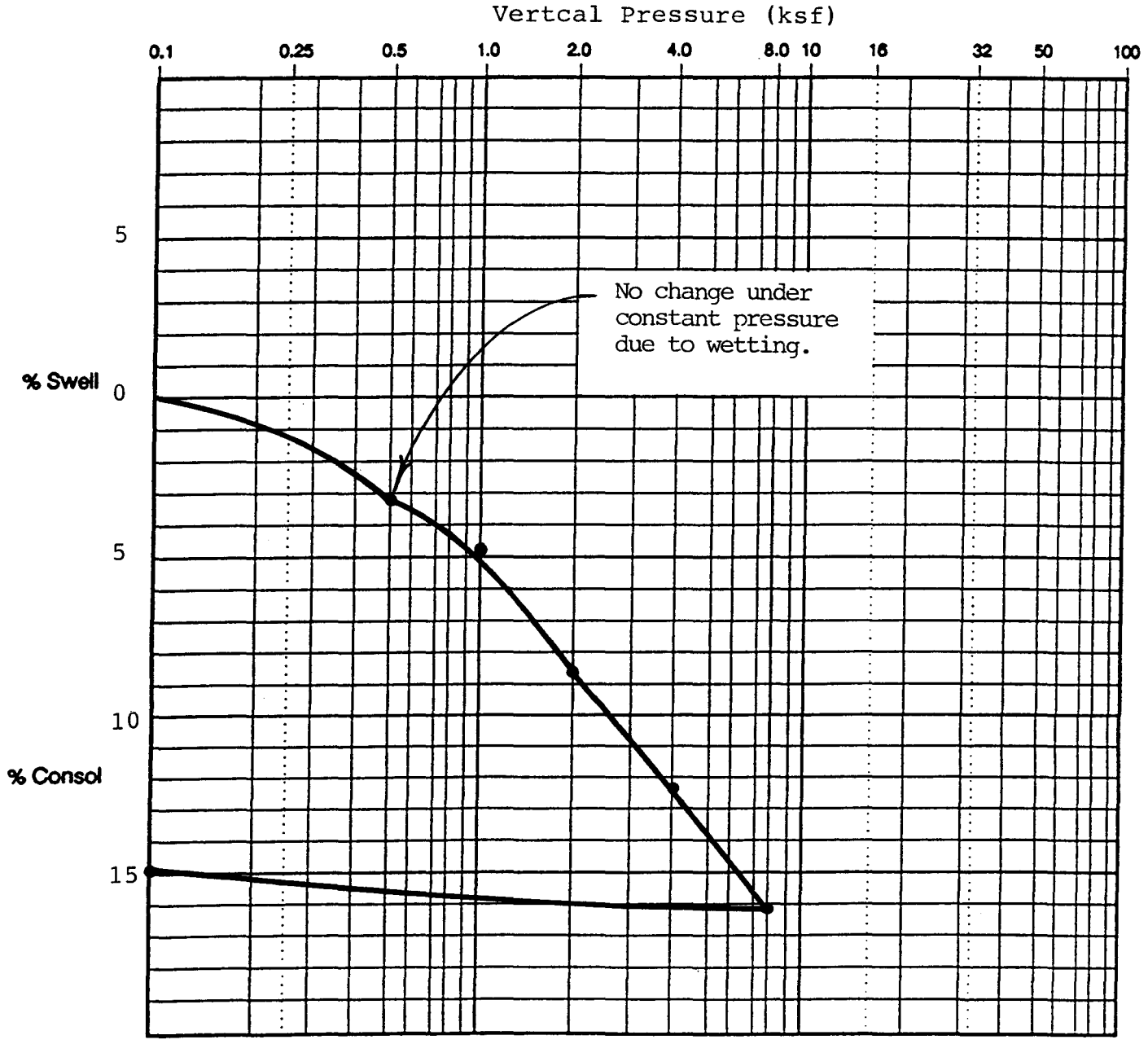
Project: Multi - Family Housing

Location: Grand Junction, Colorado

Job No. 202894 Date 6/14/94

SWELL CONSOLIDATION TEST

Drill Hole No.	TH-3	Sample No.	D-1	Sample Depth Interval	3.0'-4.0'		
Sample Description	Sand, clayey						
Initial Water Content	6.1	Dry Unit Weight	90.3 pcf	Initial Saturation			
Final Water Content	22.1	Specific Gravity		☐ Assumed			
Liquid Limit	28	Plastic Limit	17	Plasticity Index	11	Classification	SC



WESTERN COLORADO TESTING, INC.	529 25½ Road, Suite B-101 Grand Junction, CO 81505 (303) 241-7700	Project	Multi - Family Housing
		Location	Grand Junction, Colorado
		Job No. 202894	Date 6/14/94

Figure 9

WESTERN COLORADO TESTING, INC.

Project Multi - Family Housing
Location Grand Junction, Colorado
Job No 202894 Date 6/14/94

SUMMARY OF SOIL TESTS

Test Hole No.	Sample No.	Sample Depth (ft)	Sample Dia. (in)	Sample Hgt. (in)	Water Content (%)	Density		Void Ratio (e)	Unconfined Compression		Atterberg Limits			Cons Test	% Pass #200 Sieve	Classification or Remarks
						Wet (pcf)	Dry (pcf)		QU (tsf)	Strain (%)	LL	PL	PI			
TH-1	D-1	2.0-3.0	2.42		5.0	91.9	87.5				27	17	10	*	85.6	CL
TH-1	SP-1	7.0-8.5	1.5		4.6	-	-									
TH-1	D-2	12.0-13.0	2.42		6.3	99.4	93.5									
TH-2	SP-1	3.0-4.5	1.5		5.1	-	-								77.8	Soluble Sulfates 50 ppm
TH-2	D-1	8.0-9.0	2.42		3.6	105.9	102.2									
TH-3	D-1	3.0-4.0	2.42		6.1	95.8	90.3				28	17	11	*	46.6	SC
TH-3	SP-2	13.0-14.5	1.5		5.7	-	-									
TH-4	SP-1	3.0-4.5	1.5		6.5	-	-								63.5	
TH-4	D-1	8.0-9.0	2.42		3.3	112.1	108.5									
TH-4	SP-3	20.0-21.5	1.5		12.8	-	-									

Figure 10

WestWater Engineering
Consulting Engineers

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

June 19, 1996

Michael Drollinger
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501-1430

RE: Orchard Lodge Congregate Living Facility, File #SPR-96-80
Fruitvale Sanitation District Comments

Dear Michael,

Revised Plans for Orchard Lodge Congregate Living Facility dated June 11, 1996 were received by our office on June 18. Following are comments from the Fruitvale Sanitation District, numbered in accordance with comments itemized in our letter dated May 20, 1996.

1 and 2. Completed.

3. The District's Standard Sanitary Sewer Detail sheet has been recently revised and should be used to replace sheet 11. A copy can be made available upon request.

4, 5, 6, 7, 8, 9, 10, and 11. Completed.

12. Air pressure test results stamped and signed by a professional engineer will be required upon completion of construction.

13. Completed.

14. As-built drawings stamped and signed by a professional engineer will be required upon completion of construction.

15. Sewer tap fees and monthly user fees should be coordinated with Art Crawford, District Manager and the City of Grand Junction prior to occupation of the building.

16. Additional information is requested in regard to operation of the proposed swimming pool for review. Any proposed discharges from the pool into the sanitary sewer system shall be subject to the District's approval.

Additional comments on the current submittal include the following:

17. Approval blocks for the District should read "Initial Acceptance" rather than "Accepted as

Constructed" on the cover sheet, and sheets 2 and 6.

18. The invert in elevation of the drop inlet pipe at drop MH A-5 should be specified as 4624.52 on the profile, sheet 6.

19. The note in the plan view on sheet 6 that refers to encasement of the sewer line at a water line crossing should be corrected to refer to detail sheet 11, rather than sheet 10. The detail shown on sheet 9 should not be used. An acceptable alternate to reinforcing bars in the encasement is to use fiber reinforced concrete.

20. To clarify note 15 of sheet 6, and to distinguish between private and District sewerlines, the plan view should identify the limits of ownership at MH A-2. This could be delayed until as-built drawings are completed, but would be preferred to be included at this time.

21. Because the proposed facility will include a commercial kitchen, the District will require a grease trap in conformance with City of Grand Junction criteria. Details of the grease trap should be submitted for approval.

Please have the petitioner address the aforementioned comments and submit 5 full sets of the plans for final approval. We will retain 2 sets for the District and return 3 to the petitioner for distribution. If additional approved sets are required for distribution,

Should you have any questions, please do not hesitate to call our office.

Respectfully,

C Kellie Knowles

C. Kellie Knowles, P.E.

cc: Art Crawford, District Manager
Frank Warlick, Project Manager
Jim Langford, Thompson-Langford

June 20, 1996

Mr. Michael Drollinger
Staff Representative
City of Grand Junction
Planning Department

Re: Orchard Lodge, Inc
W side of 28 ¼ Road; N of Orchard Ave.

Dear Michael,

We are respectfully submitting our revised plans for the Orchard Lodge Project. We trust the package will be fully compliant with your, the City Staff, and outside agencies' comments and requests. If you have any questions or comments please do not hesitate to call.

The following are the written responses, (in the same order as your letter), for your records of the submittal for file #SPR-96-80:

MESA COUNTY BUILDING DEPARTMENT
No comments.

MESA COUNTY PLANNING DEPARTMENT
Yes there is adequate buffer between this development and the Princess Subdivision.

GRAND JUNCTION DRAINAGE DISTRICT
1. No response necessary—we understand the Grand Valley Irrigation Co. and Grand Valley Water Users Assoc. are both involved in the property/development on the south and north respectively.
2. A headgate agreement with the Irrigation District is in progress. There is no plan to develop the area north of the canal. Area south of the canal is indicated on the current plans for planning department approval at this time. Further development would require resubmission.

CITY FIRE DEPARTMENT
1. A flow test has been conducted by the Fire Department since the comments were received.
2. Fire Hydrant locations have been coordinated with Hank Masterson on the revised set of documents.
3. The radius of the fire access at the northwest and southwest corners is apparently not now required to be widened to 20 ft. at the radius'. This has been determined between Hank Masterson of the Fire Department and Jim Langford per their meeting.
4. Access for Fire Department and landscaping has been coordinated on the current submittal.
5. Fire hydrants have been coordinated on the current set of plans with Hank Masterson of the Fire Department. A standpipe is not now required since the flow test has been conducted. In lieu of the standpipe, the Fire Department is requiring a loop for the water line since the line at 28 ¼ Road is a dead end.
6. The building will be fully sprinklered.
7. Fire sprinklers will be required as a design-build item in the building documents. Drawings and calculations will be submitted for Fire Department approval before installation.

PUBLIC SERVICE COMPANY

The Owner's Representative for the Project has provided information to Public Service Company for an easement through Mr. John Salazar. When Public Service provides the easement, this portion will be complete. The Owner has agreed to provide a utility easement of 15 ft. along the east side of the property.

CITY DEVELOPMENT ENGINEER

1. Copies of easements are attached to the revised submission.
2. Permits will be requested for the street cuts before construction begins.
3. A check for $9627.70 is attached.

CITY PARKS AND RECREATION

1. A check for the amount of $24,975.00 as requested is attached.
2. Development of this property is occurring on the south side of the canal. Owner would like to see any proposed easements for hike and bike trails occur on the north side of the canal. The Owner will be happy to participate when plans are ready for review and approval.

GRAND VALLEY IRRIGATION

1. We are aware the main line Canal crosses this property.
2. We are not encroaching on the north or south side of the canal with the building construction. Trees originally shown on the tree planting plan within the 25' canal R.O.W. have been removed from the plans.
3. Irrigation requirements will be incorporated into the documents. We currently indicate the overall irrigation plan with required operating pressures, pipe sizes, etc. Final connection to the canal, Grand Valley Irrigation requirements will be included when the final agreement is completed and required details for the installation are obtained from Grand Valley Irrigation. We assume the irrigation agreement will include compliance with Grand Valley Irrigation requirements before a tap is made.
4. Landscape documents have been prepared by a Landscape Architect. They have been reviewed by local Landscape Contractors and Nurseries for compliance with local conditions. As previously discussed with Mr. Phil Bertrand, the Landscape Architect will visit the site with Mr. Bertrand and Frank Warlick, the Project's Project Manager, to determine both the extent and actual limits of landscaping and irrigation to be provided on the slope adjacent to the canal. This suggested approach also follows the recommendations indicated under Item #2 by John Ballagh of the Grand Junction Drainage District.

CITY UTILITY ENGINER

1. The City of Grand Junction has been noted as the purveyor of the water for the Project.
2. The Health Department has been noted as "Mesa County".

1. Meter location is indicated on the Thompson Langford utility plans.
2. Thompson Langford Engineers has verified the line to be an 8" line as indicated on the drawings rather than a 6" line.

1. Irrigation will not be provided from the City, but from the irrigation canal, and Grand Valley Irrigation.

CITY POLICE DEPARTMENT

Lighting analysis is shown on the current plan submittal.

COMMUNITY DEVELOPMENT DEPARTMENT

Responses to follow later in this letter.

FRUITVALE SANITATION

1. Sewer connection is shown on the documents at Orchard Ave. location.
2. Installing Contractor will provide compliant tests and meet District standards.
3. A copy of the signed extension application agreement is attached.
4. Thompson Langford's drawings indicate the required manhole.
5. Installing Contractor will submit plans for approval at time of construction and permitting with the County Building Department for approval. As Built drawings will be supplied to the District by installing contractor.
6. No comment.
7. The swimming pool will be approximately 12 ft. wide X 26 ft. long X 4'-6" deep. The pool is heated with a natural gas heater, (300,000 BTU) vented through the roof. It will have a ¾ h.p. pump with a capacity of 25 g.p.m. for circulation. Filter is 18" diameter high rate sand filter to accept 45 g.p.m. Capacity of the pool is approximately 8100 gallons.
8. Final site and utility drawings are now completed and included in this submittal.

STAFF REVIEW

GENERAL

1. Drawings agreed to be acceptable at time of submittal in 30"X42" size have been reduced to 24"X36" or 2/3 of scale indicated on the drawing to comply with this request. This has been done only on the Landscape Drawings. The other documents are all 24'X36". Landscape drawings for construction and contractors will be the 30"X42" size. We believed we had approval to use the larger size prior to submittal due to the large size of the project. Sorry for the inconvenience.

General Continued:
2. All construction plans are now included in the set of documents.
3. OK
4. Ok

SITE PLAN
1. Per meeting with Michael Drollinger, we are including 4 sets of documents for the final submittal.
2. Ok.
3. Handicapped parking stalls are indicated on the new plans being submitted. See attached memo to Michael Drollinger from Bill Rabben regarding parking.
4. 10 percent of the parking spaces required have been provided for bicycle parking on the new plan submittal per discussions between Michael Drollinger and the Landscape Architect William Rabben. The spaces are indicated on sheet LG-1 with a detail of a bicycle rack similar to the one provided by the City shown on sheet LC-3.
5. Drawings submitted now include construction detailing and references for construction.

LAYOUT AND FINE GRADING PLAN- SHEET LG-1
1. We have provided a gate detail as requested on sheet LC-3 detail 7.
2. Gate detail has been added to the construction documents with this submittal.

IRRIGATION PLAN (SHEET L1-1)
No comments were given on this sheet.

LANDSCAPE PLAN (IDENTIFIED AS "TREES AND VINES PLANTING PLAN"- SHEET LP-1 AND SHRUBS AND GROUND COVER PLANTING PLAN- SHEET LP-2)
1. Drawings requested to be re-labeled have been revised.
2. The enlarged central courtyard is now included in the final construction documents being submitted.
3. Our proposed plant material list has ben checked and verified with local nursery sources and landscape nursery sources and landscape contractors for suitability and availability in the Grand Junction area. Adjustments to the original list have been made to reflect these local concerns without diminishing the original design intent.
4. The standards for Section 5-5-1F2c(2) regarding protection of landscape areas from vehicle encroachment have been reflected on sheet LG-1 and the landscape planting and irrigation plans.
5. As discussed between Michael Drollinger and William Rabben, the provisions of Section 5-5-1F2a have been adequately addressed in the original landscape design for this project. Therefore, it is our understanding that no additional adjustments to the plans will be required.

LIGHTING PLAN SHEET LL-1
1. An isofootcandle diagram has been provided as required for the parking lots. It is included on the lighting plan for your review as requested. We have also provided a detail for the parking lot lights.

ENGINEERING DRAWINGS PREPARED BY THOMPSON-LANGFORD

1. We have revised the perimeter wall to reflect the 6 foot high requirement.

MISCELLANEOUS

1. Development Improvement Agreement is required for the street cuts per the City Attorney. These will be provided at the time of permitting for the utility construction work as required by the City standards.
2. The updated version of the Planning Clearance you provided is attached.

NOTES:

1. We have noted your comments regarding sign permit requirements.
2. We have noted that Landscape must be constructed to City standards. It will be the local Landscape Contractor's responsibility to comply when installation occurs.
3. We understand a guarantee is required if site improvements are not complete before a certificate of occupancy is issued.

Thank you and your Staff for your help in clearance for this Project. Terra Properties looks forward to working with you in the future.

Sincerely,
Shadowfax Properties, Inc.
dba ORCHARD LODGE

Frank Warlick

Frank Warlick, Project Manager

Copies to: Julie Gilbert
Roy Blythe
Bill Rabben
Jim Langford
File

Facsimile Transmission

Date: June 6, 1996 FAX: 970-244-1599

To: Mr. Michael Drollinger, Senior Planner
Grand Junction City Planning Department
250 North Street
Grand Junction, Colorado 81501-2668

From: William Rabben, ASLA
OWR Landscape Architecture Urban Design Planning
23 Chickadee
Aliso Viejo, Ca. 92656

Project: Orchard Lodge, Grand Junction, Colorado

Reference: Reduction in Required Parking from (72) spaces to (70) spaces

Copies: Julie Gilbert, Frank Warlick, Roy Blythe, Noel Hart, Jim Langford

---

Dear Michael:

In response to our most recent conversation, it is my understanding that a variance in the total number of required parking spaces may be possible if Ownership can provide the following additional data:

1.0 Information that shows that resident car ownership levels for this project are less than those determined in the calculation for the city parking code.

2.0 Is there, or can there be, any provision for a shuttle service for the project that may influence required parking counts?

In addition, The current plans showing (68) total spaces will accommodate (70) parking spaces if the (3) extra handicap spaces provided adjacent to the resident entry on the current plans are converted to standard spaces. This adjustment can be made by simply changing the striping in this area to indicate regular spaces in lieu of handicap spaces.

Based on this information, it is our understanding that you have agreed to allow the plans to be resubmitted in their current state, as long as the additional data mentioned above is provided to you prior to completing your plan check process on the resubmitted plans.

It is also our understanding that if the forthcoming data is not conclusive or insufficient to grant this variance, the applicant will be allowed to submit a supplemental plan indicating the proposed location for the (2) additional parking spaces needed to fulfill the original parking requirement of (72) spaces. Thank you for your coorporation.

Sincerely, William Rabben, ASLA

June 20, 1996

Mr. Michael Drollinger
Staff Representative
City of Grand Junction
Planning Department

Re: Orchard Lodge, Inc
W side of 28 ¼ Road; N of Orchard Ave.

Dear Michael,

We are respectfully submitting our revised plans for the Orchard Lodge Project. We trust the package will be fully compliant with your, the City Staff, and outside agencies' comments and requests. If you have any questions or comments please do not hesitate to call.

The following are the written responses, (in the same order as your letter), for your records of the submittal for file #SPR-96-80:

MESA COUNTY BUILDING DEPARTMENT
No comments.

MESA COUNTY PLANNING DEPARTMENT
Yes there is adequate buffer between this development and the Princess Subdivision.

GRAND JUNCTION DRAINAGE DISTRICT
1. No response necessary—we understand the Grand Valley Irrigation Co. and Grand Valley Water Users Assoc. are both involved in the property/development on the south and north respectively.
2. A headgate agreement with the Irrigation District is in progress. There is no plan to develop the area north of the canal. Area south of the canal is indicated on the current plans for planning department approval at this time. Further development would require resubmission.

CITY FIRE DEPARTMENT
1. A flow test has been conducted by the Fire Department since the comments were received.
2. Fire Hydrant locations have been coordinated with Hank Masterson on the revised set of documents.
3. The radius of the fire access at the northwest and southwest corners is apparently not now required to be widened to 20 ft. at the radius'. This has been determined between Hank Masterson of the Fire Department and Jim Langford per their meeting.
4. Access for Fire Department and landscaping has been coordinated on the current submittal.
5. Fire hydrants have been coordinated on the current set of plans with Hank Masterson of the Fire Department. A standpipe is not now required since the flow test has been conducted. In lieu of the standpipe, the Fire Department is requiring a loop for the water line since the line at 28 ¼ Road is a dead end.
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3. We understand a guarantee is required if site improvements are not complete before a certificate of occupancy is issued.

Thank you and your Staff for your help in clearance for this Project. Terra Properties looks forward to working with you in the future.

Sincerely,
Shadowfax Properties, Inc.
dba ORCHARD LODGE

Frank Warlick, Project Manager

Copies to: Julie Gilbert
Roy Blythe
Bill Rabben
Jim Langford
File

Facsimile Transmission

Date: June 6, 1996 FAX: 970-244-1599

To: Mr. Michael Drollinger, Senior Planner
Grand Junction City Planning Department
250 North Street
Grand Junction, Colorado 81501-2668

From: William Rabben, ASLA
OWR Landscape Architecture Urban Design Planning
23 Chickadee
Aliso Viejo, Ca. 92656

Project: Orchard Lodge, Grand Junction, Colorado

Reference: Reduction in Required Parking from (72) spaces to (70) spaces

Copies: Julie Gilbert, Frank Warlick, Roy Blythe, Noel Hart, Jim Langford

---

Dear Michael:

In response to our most recent conversation, it is my understanding that a variance in the total number of required parking spaces may be possible if Ownership can provide the following additional data:

1.0 Information that shows that resident car ownership levels for this project are less than those determined in the calculation for the city parking code.

2.0 Is there, or can there be, any provision for a shuttle service for the project that may influence required parking counts?

In addition, The current plans showing (68) total spaces will accommodate (70) parking spaces if the (3) extra handicap spaces provided adjacent to the resident entry on the current plans are converted to standard spaces. This adjustment can be made by simply changing the striping in this area to indicate regular spaces in lieu of handicap spaces.

Based on this information, it is our understanding that you have agreed to allow the plans to be resubmitted in their current state, as long as the additional data mentioned above is provided to you prior to completing your plan check process on the resubmitted plans.

It is also our understanding that if the forthcoming data is not conclusive or insufficient to grant this variance, the applicant will be allowed to submit a supplemental plan indicating the proposed location for the (2) additional parking spaces needed to fulfill the original parking requirement of (72) spaces. Thank you for your coorporation.

Sincerely, William Rabben, ASLA

Facsimile Transmission

Date: June 21, 1996 FAX: 970-244-1599

To: Mr. Michael Drollinger, Senior Planner
Grand Junction City Planning Department
250 North Street
Grand Junction, Colorado 81501-2668

From: William Rabben, ASLA
OWR Landscape Architecture Urban Design Planning
23 Chickadee
Aliso Viejo, Ca. 92656

Project: Orchard Lodge, Grand Junction, Colorado

Reference: Reduction in Required Parking from (72) spaces to (70) spaces

Copies: Julie Gilbert, Frank Warlick, Roy Blythe, Noel Hart, Jim Langford

---

Dear Michael:

In response to your request for further back up information in support of our Applicant's desire to reduce the parking requirement for the above referenced project by two (2) spaces, Ownership has supplied me with the following supporting data:

A shuttle service has always been planned for the project, to reduce the need for exclusive car use by the residents and most importantly, to provide a clear choice for those who do not wish to drive everywhere, all the time.

In Ownership's past experience operating a similar facility with a population of 120 units that apparently was almost always 100% occupied, there were 70 parking spaces provided. Occasionally the lot was full, but evidently the 70 spaces has worked out very well for this facility. Therefore, based on this experience, Terra Properties feels very safe and comfortable with the 70 spaces currently provided for the Orchard Lodge facility.

Based on this information and on behalf of the Applicant, I would like to formally submit that this minor variance of two (2) parking spaces appears both reasonable and justified and should be granted based on the information provided to me indicating the Owner's previous experience operating a similar facility which actually has eight (8) more occupied units than this one.

This information was provided to me by Ms. Julie Gilbert, President of Terra Properties. If you require any further information or have any questions please contact me at once. Thank you again for your cooperation.

Sincerely,

William Rabben, ASLA

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

July 1, 1996

Frank Warlick
Project Manager
Shadowfax Properties, Inc.
3505 N. 12th Street, Apt A2
Grand Junction CO 81506

RE: Administrative Decision - Orchard Lodge (Our File #SPR-96-80)

Dear Mr. Warlick:

We have reviewed the revised submittal for the above-referenced application and have identified one outstanding item which remains to be addressed. Once the condition is satisfied final approval will be issued; the approval becomes a denial if the condition is not met. Four sets of stamped plans which address all concerns must be submitted *prior* to issuance of a Planning Clearance and commencement of construction. The petitioner must respond to the comments contained herein within 30 days; we would expect that the follow up staff review would be completed within 5 working days.

The outstanding issue relates to a trail easement requested by the Parks and Recreation Department in the original review comments. The trail easement was requested on the south side of the canal because the route is the only alternative for a trail alignment to the west. Please explain why the easement requested is not being provided on the south side of the canal as it appears that there is adequate area for a trail easement dedication. Please contact the City Parks Planner, Shawn Cooper (244-3869), if you have any questions regarding to this requirement.

As a reminder, the Pubic Works Department must be contacted regarding the required permits for work in the public right-of-way. The final plans will need to be approved and signed by the Fruitvale Sanitation District prior to signature by the City.

If you have any questions or require further clarification of any item please do not hesitate to contact me.

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: Shawn Cooper, Parks Planner

h:\cityfil\1996\96-080.lt1

WestWater Engineering
Consulting Engineers

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

July 9, 1996

Michael Drollinger
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501-1430

RE: Orchard Lodge Congregate Living Facility - Fruitvale Sanitation District Comments

Dear Michael,

Revised Plans for the above referenced project were submitted to our office on June 26, 1996. The District's previous comments regarding the engineering design of the sanitary sewer outside of the building have been adequately addressed with this submittal. There are, however, two comments that would appear to be the responsibility of the project architect rather than project engineers. Theses two comments consist of the following:

1. Additional information is requested in regard to the operation and maintenance of the proposed swimming pool. Any proposed discharges from the pool into the sanitary sewer system shall be subject to the District's approval. This information remains unanswered at this time.

2. Verification that the proposed commercial kitchen will include a grease trap or grease interceptor per requirements of the District under their agreement with the City of Grand Junction. Details of the grease trap should be submitted for approval.

It is recommended that the Orchard Lodge representatives coordinate with the City of Grand Junction and the District in regard to sewer tap fees and monthly user fees for the facility.

Plans have been approved by the District for construction and returned to Jim Langford. Please notify the District 48 hours in advance of construction. Initial acceptance will remain contingent on receipt of the above requested information, as well as completion of all alignment, deflection and leakage testing, submittal of air pressure test results that are stamped and signed by a professional engineer and submittal of as-built drawings per previous letters.

Respectfully,

C. Kellie Knowles

C. Kellie Knowles, P.E.

cc: Art Crawford, District Manager
Frank Warlick, Project Manager
Jim Langford, Thompson-Langford w/enclosures

Memorandum

DATE: August 15, 1996

TO: Michael Drollinger

FROM: Hank Masterson

RE: Orchard Lodge: SPR-96-180

This memo is to update you on the status of Fire Department review comments dated April 12, 1996.

1. The flow test has been completed and adequate flows are available.

2. A looped water line requirement has been waived by us because of impracticality. Required fire flows are low because of the complete fire sprinkler system and because the building is separated by three area separation walls.

3. The 12' wide access road shown at the northwest and southwest corners must be increased to 20' width.

4. The exterior standpipe requirement has been waived by us because there is a 12' wide access along the west side of the building. Interior standpipes are still required.

5. The relocation of fire hydrants is as previously required.

Let me know if you have any questions.

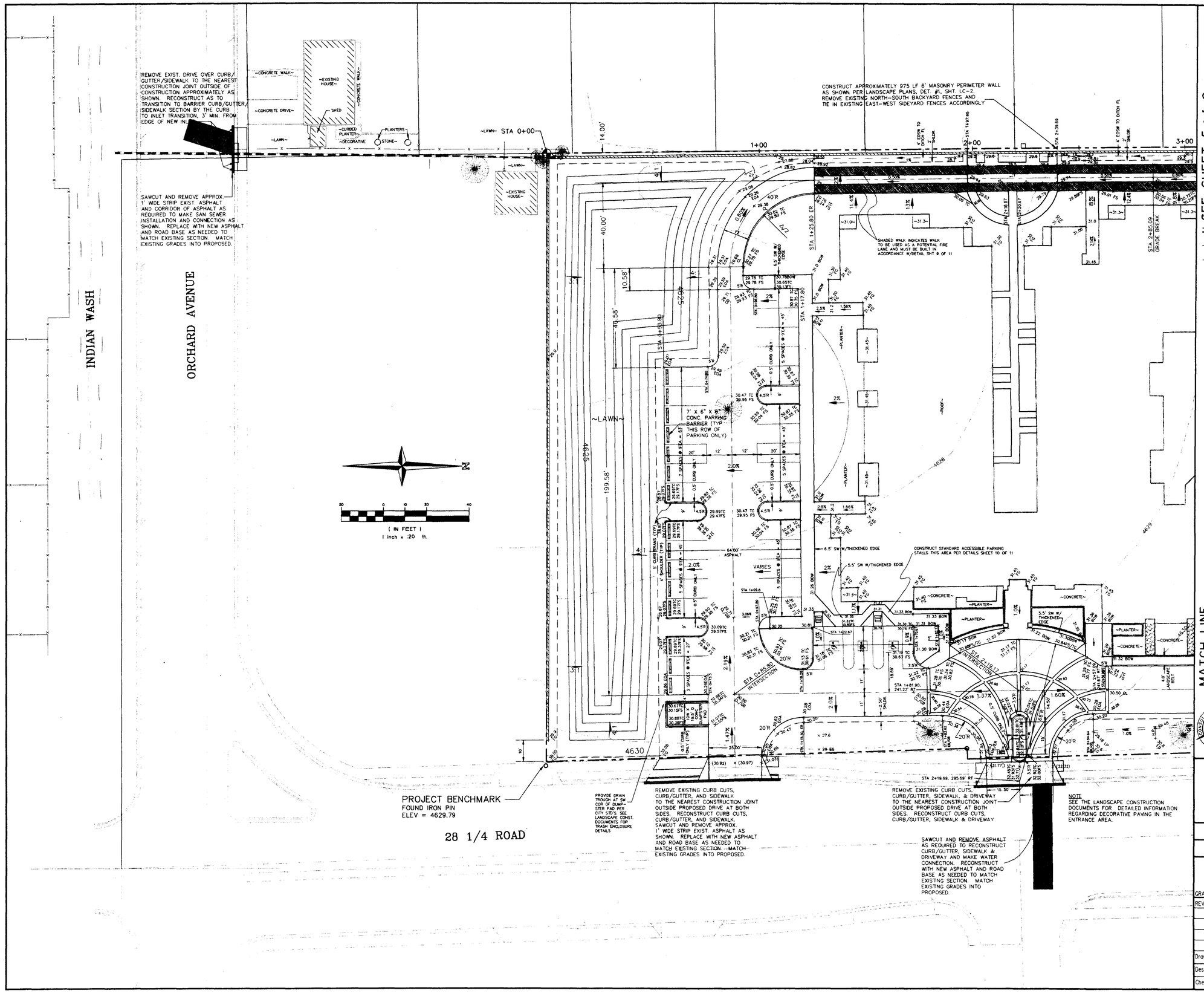
To: BILLN (Bill Nebeker)
From: Millie Fowler
Subject: Re: Orchard Lodge
Date: 9/19/96 Time: 8:19AM

Originated by: BILLN @ CITYHALL on 9/18/96 3:58PM
Replied by: MILLIEF @ CITYHALL on 9/19/96 8:19AM

110 care units	X .36	= 39.60	
1 mgr apt	X .72	= .72	
10 washers	X .90	= 9.00	
total EQU		= 49.32	X $750.00 = $36,990.00 PIF

LEGAL DESCRIPTION

The East 1/4 of the SW1/4 NW1/4 of Section 7, Township 1 South, Range 1 East of the Ute Meridian;
EXCEPT the south 200 feet thereof;
AND EXCEPT Tract conveyed to City of Grand Junction, Colorado by instrument recorded February 27, 1980 in Book 1245 at Page 841;
AND EXCEPT right of way as described in Rule and Order recorded January 31, 1983 in book 1412 at page 917.



SFR-1996-080

LEGEND

- EXISTING CULVERT
- EXISTING EDGE OF ASPHALT
- EXISTING CURB AND GUTTER
- EXISTING WOOD PRIVACY FENCE
- EXISTING SURVEY MONUMENT
- EXISTING TREE
- PROPOSED DRIVE CENTER LINE
- PROPOSED EDGE OF ASPHALT
- PROPOSED CURB AND GUTTER
- PROPOSED GRAVEL SHOULDER
- PROPOSED DITCH

GENERAL NOTES

1. ALL CURB/GUTTER/ASPHALT/PARKING/STORM SEWER ETC. IS TO BE EITHER PARALLEL OR PERPENDICULAR TO THE WEST PROPERTY BOUNDARY/PROJECT BASE-LINE. STATIONING FOR THE PROJECT BASE-LINE BEGINS AT THE SOUTHWEST PROPERTY CORNER AND PROCEEDS NORTHERLY. STATIONING AND OFFSETS ARE RELATIVE THERETO.
2. STATIONING AND OFFSETS ARE RELATIVE TO THE TOP BACK OF CURB UNLESS OTHERWISE NOTED.
3. ALL TREES AND OTHER SUCH ONSITE VEGETATION WILL BE REMOVED DURING CLEARING AND GRUBBING.
4. ALL ONSITE CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF GRAND JUNCTION TECHNICAL SPECIFICATIONS AND CONSTRUCTION DETAILS.
5. CURVE DATA SHOWN HEREON IS RELATIVE TO CL, EDGE OF ASPHALT IN CASES OF CURB ONLY, OR FLOWLINE IN CASES OF CURB AND GUTTER.
6. SEE THE LANDSCAPE CONSTRUCTION DOCUMENTS FOR DETAILED INFORMATION REGARDING GRADING AND HORIZONTAL LOCATION OF WALLS, WALKS, PAVERS, FLAGSTONE, DECORATIVE CONCRETE, CONCRETE SCORING AREA DRAINS, PLANTERS, AND OTHER AREAS WITH RESPECT TO HARDSCAPE AND/OR LANDSCAPE NOT DETAILED HEREON.
7. CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ITEMS MENTIONED ABOVE IN NOTE 6 CAN BE FOUND IN IN THE LANDSCAPE CONSTRUCTION DOCUMENTS.
8. CONSTRUCTION DETAILS FOR COURTYARDS, DINING TERRACES, AND PATIOS ARE ENTIRELY BASED ON OR CAN BE FOUND IN THE LANDSCAPE CONSTRUCTION DOCUMENTS.

American Consulting Engineers Council Member

THOMPSON-LANGFORD CORP.
529 25 1/2 RD., SUITE B210
GRAND JUNCTION, COLORADO
PH. (303) 243-6067

ORCHARD LODGE CONGREGATE LIVING FACILITY

GRAND JUNCTION, COLORADO

SITE, GRADING, AND DRAINAGE PLAN

GRAD4196.DWG

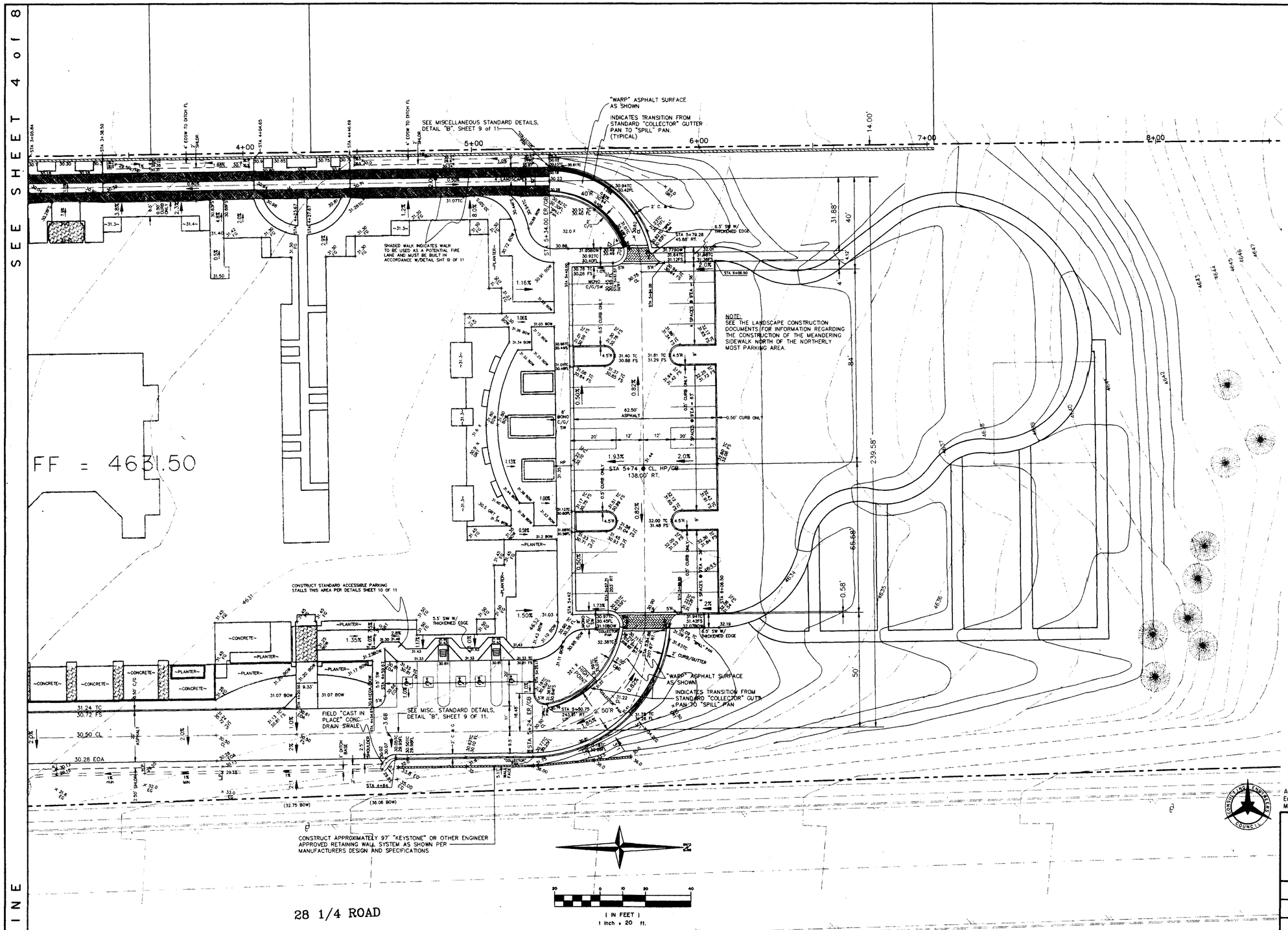
REVISION	DATE	DESCRIPTION	BY	CH'D

Drawn: JCS	Approved:		4 of 11
Designed: JCS	Date: 6/18/96		
Checked: JEL	Scale: 1" = 20'	Project No. 0249-001	

SEE SHEET 4 of 8

MATCH LINE

SPR-1996-080



LEGEND

- EXISTING CULVERT
- EXISTING EDGE OF ASPHALT
- EXISTING CURB AND GUTTER
- EXISTING WOOD PRIVACY FENCE
- EXISTING SURVEY MONUMENT
- EXISTING TREE
- PROPOSED DRIVE CENTER LINE
- PROPOSED EDGE OF ASPHALT
- PROPOSED CURB AND GUTTER
- PROPOSED GRAVEL SHOULDER
- PROPOSED DITCH

GENERAL NOTES

1. ALL CURB/GUTTER/ASPHALT/PARKING/STORM SEWER ETC. IS TO BE EITHER PARALLEL OR PERPENDICULAR TO THE WEST PROPERTY BOUNDARY/PROJECT BASE-LINE. STATIONING FOR THE PROJECT BASE-LINE BEGINS AT THE SOUTHWEST PROPERTY CORNER AND PROCEEDS NORTHERLY. STATIONING AND OFFSETS ARE RELATIVE THERETO.
2. STATIONING AND OFFSETS ARE RELATIVE TO THE TOP BACK OF CURB UNLESS OTHERWISE NOTED.
3. ALL TREES AND OTHER SUCH ONSITE VEGETATION WILL BE REMOVED DURING CLEARING AND GRUBBING.
4. ALL ONSITE CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF GRAND JUNCTION TECHNICAL SPECIFICATIONS AND CONSTRUCTION DETAILS.
5. CURVE DATA SHOWN HEREON IS RELATIVE TO CL. EDGE OF ASPHALT IN CASES OF CURB ONLY, OR FLOWLINE IN CASES OF CURB AND GUTTER.
6. SEE THE LANDSCAPE CONSTRUCTION DOCUMENTS FOR DETAILED INFORMATION REGARDING GRADING AND HORIZONTAL LOCATION OF WALLS, WALKS, PAVERS, FLAGSTONE, DECORATIVE CONCRETE, CONCRETE SCORING AREA DRAINS, PLANTERS, AND OTHER AREAS WITH RESPECT TO HARDSCAPE AND/OR LANDSCAPE NOT DETAILED HEREON.
7. CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ITEMS MENTIONED ABOVE IN NOTE 6 CAN BE FOUND IN IN THE LANDSCAPE CONSTRUCTION DOCUMENTS.
8. CONSTRUCTION DETAILS FOR COURTYARDS, DINING TERRACES, AND PATIOS ARE ENTIRELY BASED ON OR CAN BE FOUND IN THE LANDSCAPE CONSTRUCTION DOCUMENTS.

American Consulting Engineers Council Member

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ORCHARD LODGE CONGREGATE LIVING FACILITY

GRAND JUNCTION, COLORADO

SITE, GRADING, AND DRAINAGE PLAN

GRAD4196.DWG

REVISION	DATE	DESCRIPTION	BY	CH'D

Drawn: JCS	Approved:		5 of 11
Designed: JCS	Date: 6/11/96		
Checked: JEL	Scale: 1" = 20'	Project No. 0249-001	