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File SPR-1996-107 Name: Safeway – SE Corner of 29 Road – 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
		Reduction of assessor's map.
		Evidence of title, deeds, easements
		***Mailing list to adjacent property owners**
		Public notice cards
		Record of certified mail
		Legal description
		Appraisal of raw land
		Reduction of any maps – final copy
		***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	Ordinance No. 2882 - **	X	X	Landscape Plan
X	X	Planning Clearance – issued 7/18/96 - **	X	X	Site Plan – Safeway Cottonwood Centre
X	X	Traffic Impact Analysis – 1/96	X	X	Location Map
X	X	Subsurface Soils Exploration – 1/31/96	X	X	Materials Product Information
X	X	Asphaltic Concrete Job Mix Formula – 3/4/96	X		Exhibit – City Exhibit 5 Mile Radius Map
X	X	Correspondence	X		Exhibit – City Exhibit 1 Mile Radius Map
X		Easement Agreement – preliminary – not recorded	X		Lift Station Details and Man Hole Foundation Details
X	X	Drainage Report	X		Utility Composite
X	X	Western Colorado Testing, Inc. – Physical Properties of Aggregates – 3/1/94, 6/5/96	X		Sanitary Sewer Plan and Profile
X	X	Planning Commission – 7/9/96 - **	X		Developed Basin Map
X	X	Lift Station Design Report – 10/21/96 /Agreement-Bk 2307/Pg 295	X		Historic Basin Map
X	X	Lease Agreement 8/6/96			Declaration of Covenants with Covenants and Restrictions Affecting Land

X	X	Final Approval Checklist	X	X	Restated Certificate of Incorporation of Safeway Stores-draft
X	X	Quit Claim Deed – Bk 2353 / Pg 199 - ** - copy sent to City Clerk – do not have original			
X	X	7 Sign Clearances - **			
X		Signage and Striping Plan			
X		Parking Area / Heavy Traffic Area Delineation Plan			
X		Interior Signage and Striping Plan			
X		Interior Curb, Gutter and Paving Plan			
X	X	Interior Grading, Drainage and Erosion Plan			
X		Storm Sewer Plan and ProfileHans Drain Plan and Profile			
X		Utility Composite			
X		29 Road Sanitary Sewer – Plan and Profile			
X	X	Site Specific – Grading and Drainage Details			
X		Erosion Control Detail			
X		Standard Ute Water Details			
X		Central Grand Valley Sanitation District Sanitary Sewer Details			
X		Standard Utilities Locations and Multi-Purpose Easement Details			
X		Standard City Street Details			
X		Standard City Storm Sewer Details			

DEVELOPMENT APPLICATION

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

Receipt _____
Date _____
Rec'd By _____

File No. _____

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

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
[X] Subdivision Plat/Plan	[X] Minor [ ] Major [ ] Resub	11± acres	29 Rd & Patterson	PB	
[ ] Rezone				From: To:	
[ ] Planned Development	[ ] ODP [ ] Prelim [ ] Final				
[ ] Conditional Use					
[ ] Zone of Annex					
[ ] Variance					
[ ] Special Use					
[ ] Vacation					
[ ] Revocable Permit					

LOCAL REPRESENTATIVE:
LANDESIGN LLC.
259 GRAND AVE.
GRAND JUNCTION CO 81501
(970) 245-4099

[X] PROPERTY OWNER	[X] DEVELOPER	[ ] REPRESENTATIVE
WALTER K. WAYMEYER	SAFEWAY INC	Concept West Architects
Name	Name	Name
5430 SAWMILL RD #18	6900 S. Yosemite	202 E Cheyenne Mtn Blvd
Address	Address	Address
PARADISE CA 95969-5969	Englewood CO 80112	Colorado Springs 80906
City/State/Zip	City/State/Zip	City/State/Zip
916 877 9714	303 843-7572	1-800-568-7542
Business Phone No.	Business Phone No.	Business Phone No.

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

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

X Michael Weis — 1-21-96
Signature of Person Completing Application — Date

X Walter K. Waymeyer — 1/24/96

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

DEVELOPMENT APPLICATION

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

Receipt _____
Date _____
Rec'd By _____

File No. _____

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

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
☒ Subdivision Plat/Plan	☒ Minor ☐ Major ☐ Resub	10.63	29 ROAD & F ROAD	P.B.	
☐ Rezone				From: To:	
☐ Planned Development	☐ ODP ☐ Prelim ☐ Final				
☐ Conditional Use					
☐ Zone of Annex					
☐ Variance					
☐ Special Use					
☐ Vacation					
☐ Revocable Permit					

Local Representative
LANDesign LLC
259 Grand Avenue
Grand Junction, CO 81501
(970) 245-4099

☒ PROPERTY OWNER	☒ DEVELOPER	☐ REPRESENTATIVE
Walter Waymeyer	Safeway Inc	Concept West Architects
Name	Name	Name
5430 Sawmill Rd. #18	6900 S. Yosemite	202 E. Cheyenne Mtn. Blvd.
Address	Address	Address
Paradise, CA. 95969	Englewood, CO 80112	Colorado Springs, CO 80906
City/State/Zip	City/State/Zip	City/State/Zip
	303 843-7551	(800) 568-7542
Business Phone No.	Business Phone No. -7572	Business Phone No.

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

We hereby acknowledge that we have familiarized ourselves with the rules and regulations with respect to the preparation of this submittal, that the foregoing information is true and complete to the best of our knowledge, and that we assume the responsibility to monitor the status of the application and the review comments. We recognize that we or our representative(s) must be present at all required hearings. In the event that the petitioner is not represented, the 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.

CRAIG POTTER — DIRECTOR OF CONSTRUCTION — 5/23/96
Signature of Person Completing Application — SAFEWAY INC. SAME ADDRESS AS ABOVE — Date

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

SUBMITTAL CHECKLIST

SITE PLAN REVIEW ~~Minor Subdivision~~

Location: SE corner 29 & F Rd Project Name: Safeway

ITEMS		DISTRIBUTION																													
Date Received 4-30-96 Receipt # 3928 File # SPR-96-107 DESCRIPTION $380.00	SSID REFERENCE	● City Community Development	● City Dev. Eng.	● City Utility Eng.	● City Property Agent	● City Parks/Recreation	● City Fire Department	● City Attorney	● City Downtown Development	● County Planning	● County Bldg. Dept.	● Irrigation District	● Drainage District	● Water District	● Sewer District	● U.S. West	● Public Service	O GVRP	O CDOT	● Corps of Engineers	O Walker Field	● Persigo WWT	O Mesa County Health	● State Environ. Health	O City Sanitation	O School Dist #51	TCI CABLE POLICE DEPT					TOTAL REQ'D.
● Application Fee $400 plus $4/lot	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																							
~~● Deed~~	~~VII-1~~	1			1			1																							
● ~~Easements~~ Application form ☆	~~VII-2~~ 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					
Avigation Easement	VII-1	1			1			1																							
O ROW	VII-2	1	1	1	1			1																							
● 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					
● 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					
● 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					
● Grading and Drainage Plan	IX-16	1	2										1						1												
● Storm Drainage Plan and Profile	IX-30	1	2										1			1	1	1													
● Water and Sewer Plan and Profile	IX-34	1	2	1			1							1	1	1	1	1													
● Roadway Plan and Profile	IX-28	1	2										1																		
● Road Cross-Sections	IX-27	1	2																												
● Detail Sheet	IX-12	1	2																												
● Landscape Plan	IX-20	2	1	1																											
● Geotechnical Report	X-8	1	1								1																				
● Final Drainage Report	X-5,6	1	2										1																		
● ~~Stormwater Management Plan~~	X-14	1	2										1						1												
O Phase I and II Environmental Rerpot	X-10,11	1	1																												
● Traffic Impact Study	X-15	1	2															1													
Final Plat	IX-15	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

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

SAFEWAY COTTONWOOD CENTER
TRAFFIC IMPACT ANALYSIS

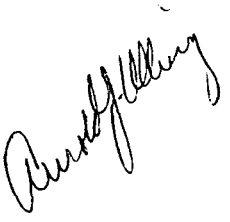
Prepared for:

Safeway
6900 South Yosemite Street
Englewood, CO 80112

Prepared by:

Felsburg Holt & Ullevig
5299 DTC Boulevard, Suite 400
Englewood, CO 80111
(303) 721-1440

Principal: Arnold J. Ullevig
Project Engineer: Pawan Maini



FHU Reference No. 95-191
January, 1996

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LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

The Safeway Cottonwood Center Development is located in the City of Grand Junction, Colorado. More precisely, it is located in the southeast corner of the intersection of F Road (also called Patterson Road) and 29 Road. The site location is shown in Figure 1.

The site covers a total area of approximately 10.5 acres. Commercial development consisting of a Safeway Store, a Fast Food restaurant, a Walk-In Bank and some retail area is planned for the site. This study assesses the potential traffic impacts associated with the proposed construction of these buildings. Specifically, traffic operational impacts for a post-development long-range scenario for the year 2015 are evaluated. Recommendations for improvements or mitigating measures to the local roadway network are also presented.

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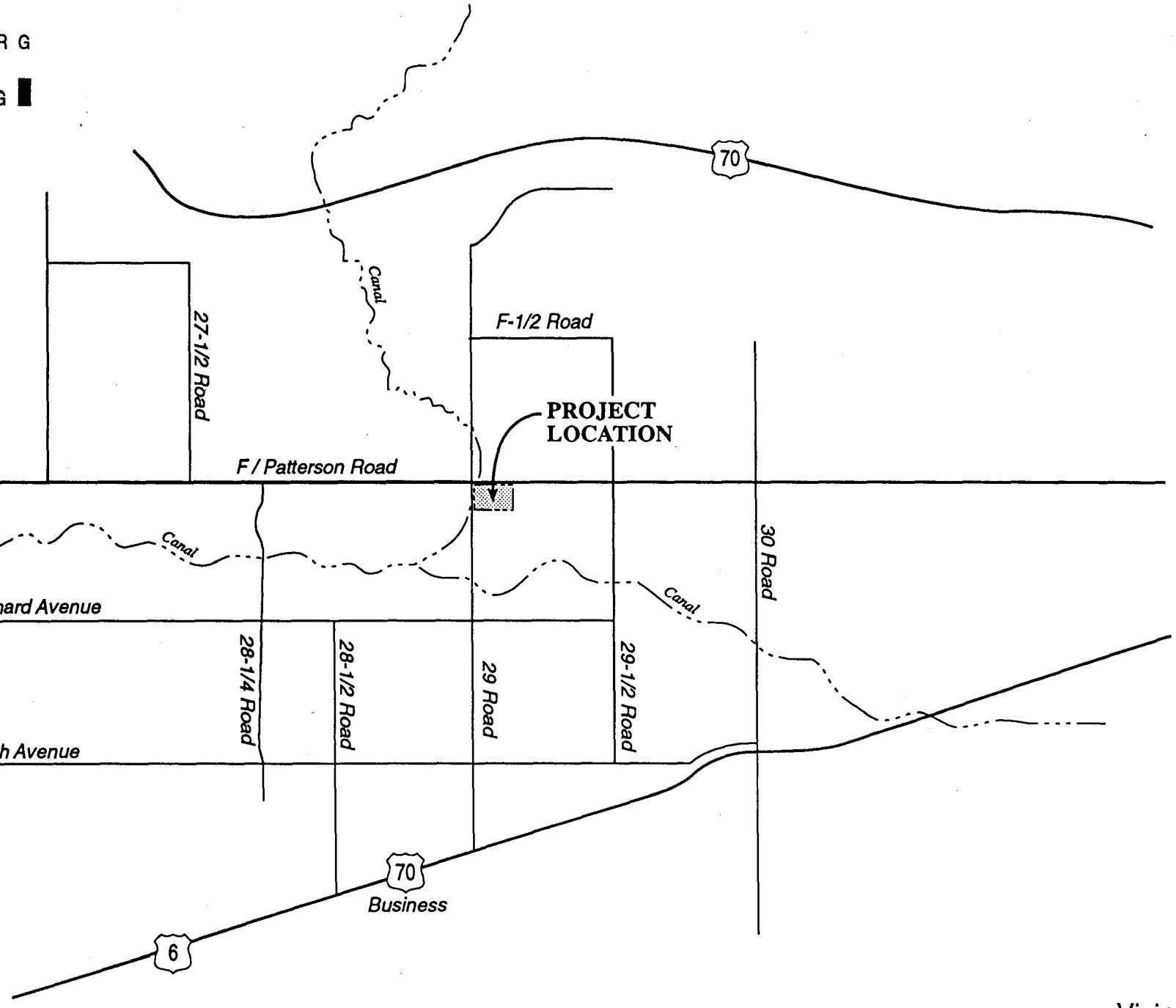

North

Figure 1
Vicinity Map

II. EXISTING CONDITIONS

A. ADJACENT LAND USE

Figure 2 shows the existing zoning and the general land uses in the area. The site, including some other parcels in the vicinity, was recently annexed by the City. The remainder of the surrounding area is under the jurisdiction of Mesa County. The area surrounding the site is primarily residential, and can be described as follows:

- North - Existing residential area, and primarily zoned for this use. One Pad zoned for business, and occupied by a Gas Station/Convenience Market with Car Wash.
- East - Existing residential area.
- South - Existing residential area
- West - Primarily zoned for/existing residential area. There is an existing religious facility south of F Road.

B. TRANSPORTATION NETWORK

The existing transportation network in the area and its physical characteristics are depicted in Figure 3. The roadway system adjacent to the project location has F Road to the North and 29 Road to the West. Access for the development is proposed both from F Road and 29 Road. The local roadway network is more precisely described as follows:

- F Road (Patterson Road) is a major arterial with four through lanes and a two-way left turn lane in the median. Its intersection with 29 Road is signalized, and left turn pockets are provided for both eastbound and westbound left turn movements. In the vicinity of the site, its intersections with 27½ Road, 28¼ Road, and 29½ Road are also signalized. A five-foot paved bike lane is provided in both the eastbound and westbound directions.
- 29 Road is designated as a major arterial roadway. Currently it is only two lanes wide, and has a paved bike lane in the southbound direction. Its intersection with Orchard Avenue is controlled by Four-way STOP signs, and its intersection with North Avenue is signalized. There are three distinct segments of 29 Road. The first extends north from US 6/I-70 Business to just south of I-70 Bypass. The second extends from north from just north of the Colorado River to south of US 6/I-70 Business. The third extends north from US 50 to Unaweep Avenue (just south of Colorado River). The need for a north-south corridor roadway has been determined in previous studies, including *Road Needs Study*, CRSS Civil Engineers, Inc., 1992 and *2015 Regional Transportation Plan*, Mesa County Metropolitan Planning Organization, 1995. Currently, MK Centennial is performing a study for the City, which is examining this corridor in great detail. The selected alternative will be classified as a major arterial roadway.

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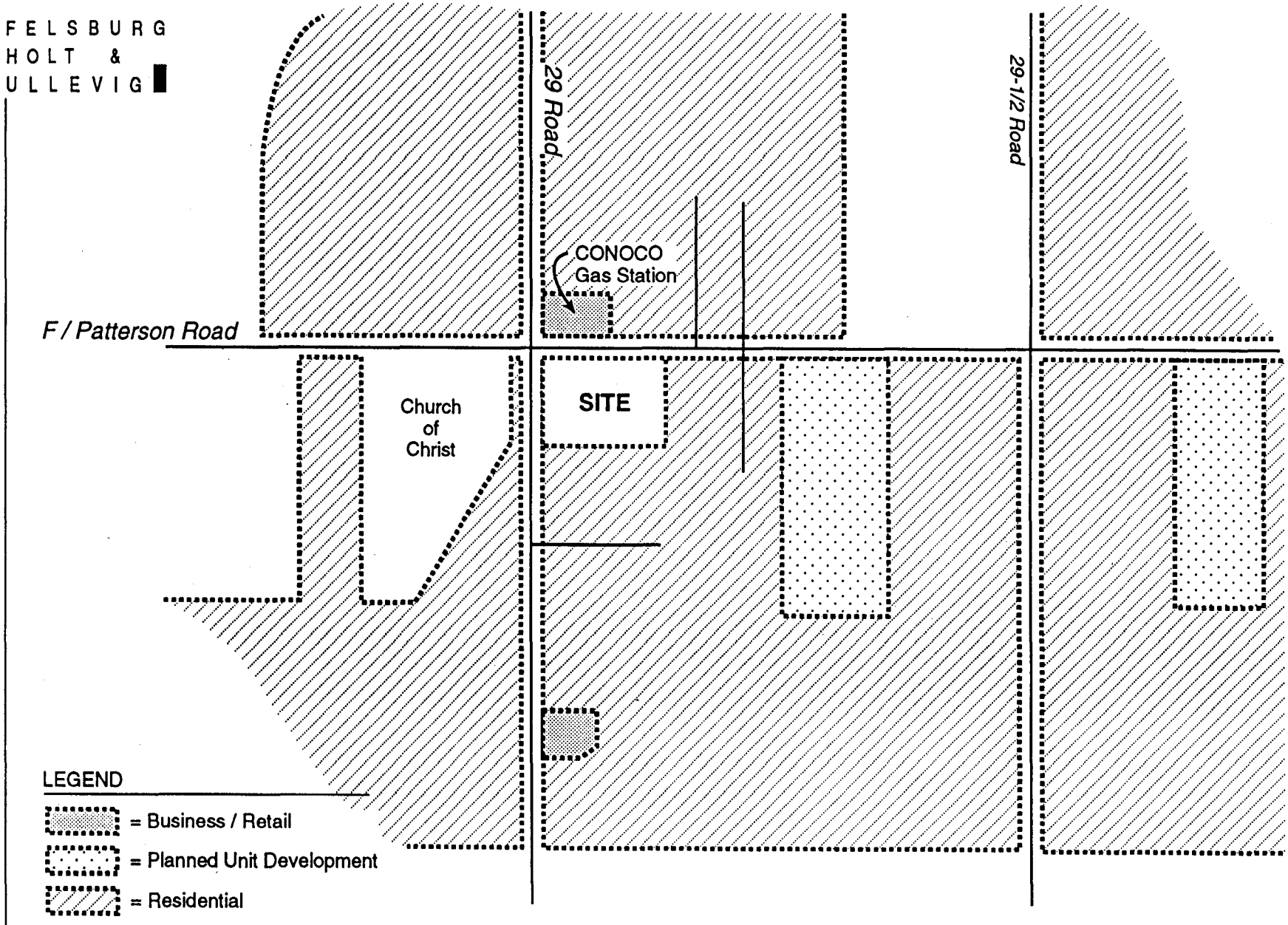

North

Figure 2

Adjacent Land Use

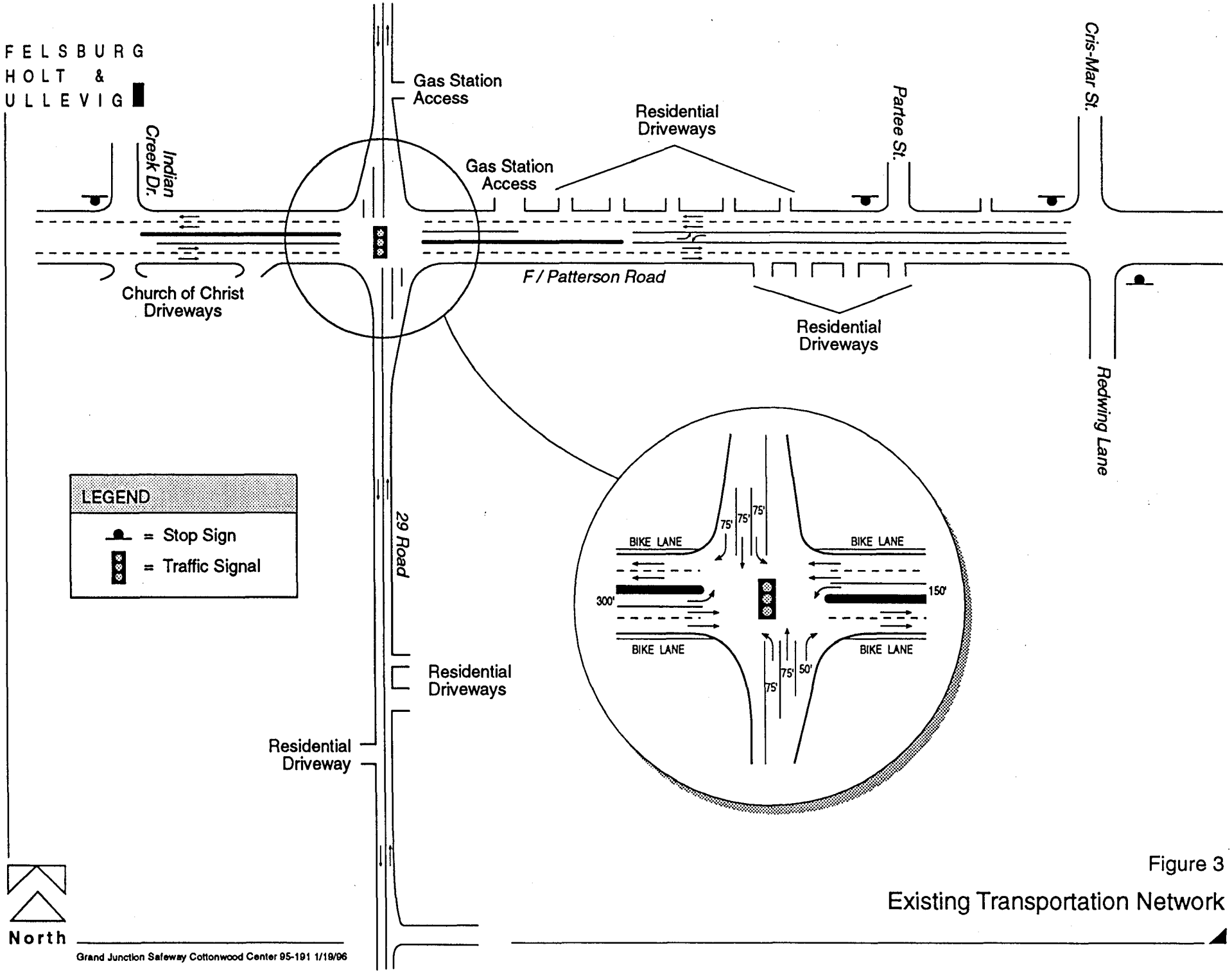

Figure 3

Existing Transportation Network

C. EXISTING TRAFFIC VOLUMES

Traffic counts were conducted on January 3, 1996. Turning movement counts for the AM and PM peak hours were conducted for the F Road/29 Road intersection. Additionally, the average daily traffic volumes were obtained from the City Development Engineer. These existing traffic volumes are shown on Figure 4.

D. EXISTING TRAFFIC OPERATIONS

F Road/29 Road is the only signalized intersection in the vicinity of the project site. The most accepted method for intersection analysis is presented in the *Highway Capacity Manual*, Transportation Research Board, Third Edition, 1985 (Updated 1994), and this has been utilized for the Level of Service (LOS) analysis. The analysis shows that the intersection operates at LOS B during both the AM and the PM peak hours. This analysis assumed that the eastbound and westbound left turns are allowed in both the protected and permitted phases. (The signal heads were recently changed to allow these permitted left turns). The calculation worksheets are included in Appendix A.1. It should be noted that no separate lane is provided for the eastbound right turn movements, and it was observed that this configuration results in additional delay for the westbound motorists.

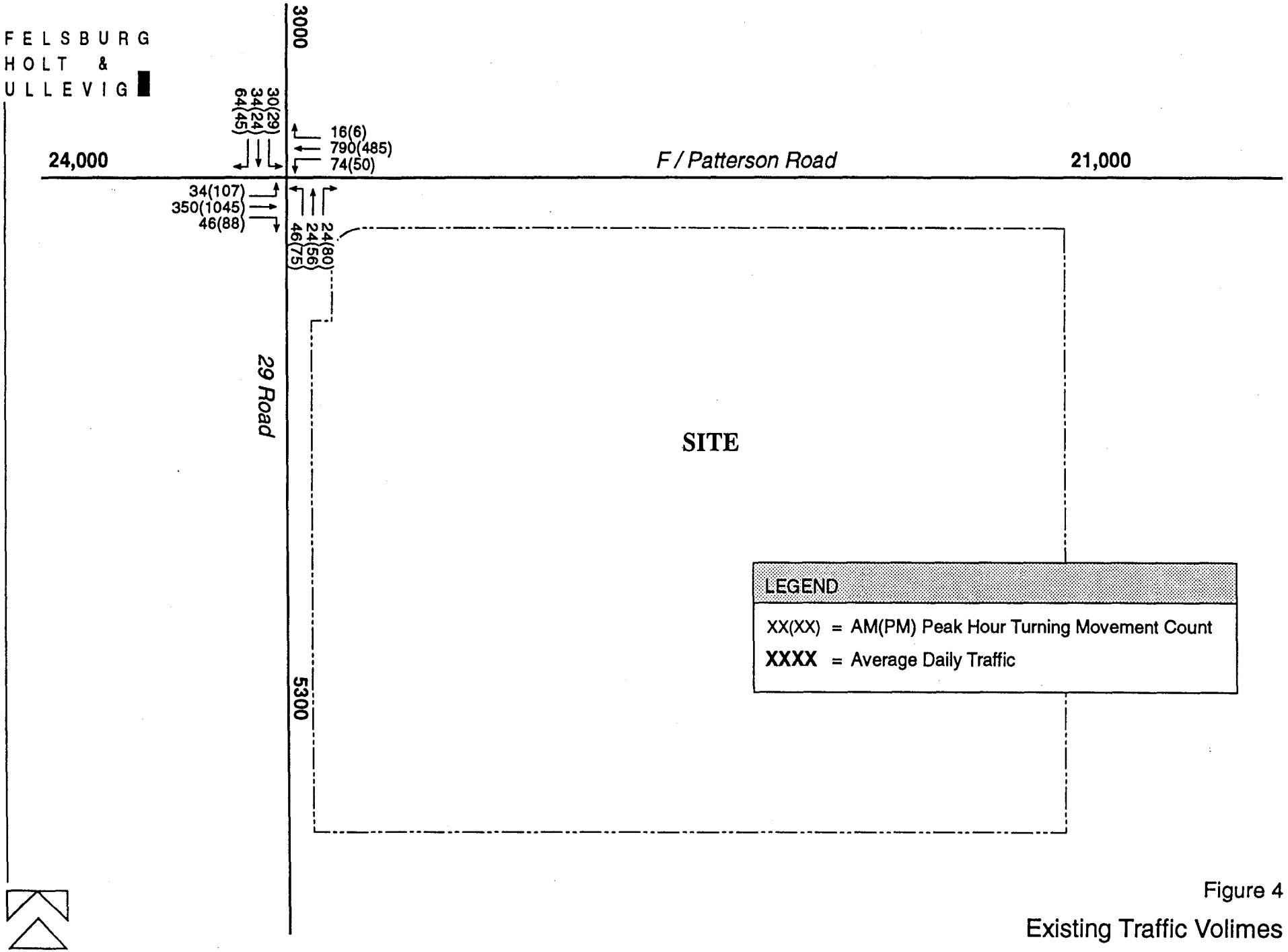

Figure 4

Existing Traffic Volimes

III. TRAFFIC PROJECTIONS AND ANALYSIS

Data regarding the proposed access locations, commercial development and the types proposed for the site were obtained from the site plan dated January 12, 1996. The development consists of a Safeway Store, a Fast Food restaurant, a Walk-In Bank and some retail area, and these are depicted in Figure 5. Two full movement accesses on 29 Road, and one full movement and one right-in right-out access on F Road are proposed.

A. TRIP GENERATION

Trip generation for the proposed commercial development was estimated based on the trip generation rates documented in *Trip Generation*, Institute of transportation Engineers (ITE), 5th edition, 1991 and the *February 1995 Update to the 5th Edition*, ITE, 1995. Trip generation for the two retail pads was estimated by first considering the entire development as one shopping center, and then considering each retail pad as a portion for the total development. This methodology will result in a more realistic estimate, than assuming each retail pad to be a separate shopping center.

Due to the nature of the commercial development, the number of pass-by trips were also calculated. Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-By Trips have been documents for major land uses and these range from 25% (Supermarket) to 55% (Fast-Food Restaurant). The weighted average is approximately 30%. It should be noted that Pass-by trips do not affect the traffic volumes accessing the site. However, they do impact the actual amount of traffic added to the local area network, which is obtained by subtracting the pass-by trips from the trips generated. The PM Peak hour was determined to be the critical peak period because of the higher background and site generated traffic volumes, and this was analyzed in greater detail.

TABLE 1
TRIP GENERATION FOR SITE

Pad Number	Land Use	Code	Area (Sq. Ft.)	Daily Trips	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour In	PM Peak Hour Out
1	Fast-Food Restaurant with Drive Through	834	4,200	2,982	120	115	80	74
2	Retail A: 9.67% of Shopping Center	820	9,000	658	10	6	30	30
3	Walk-In Bank	911	3,600	506	11	6	27	35
4	Supermarket (Safeway Store: Including Expansion)	850	65,720	-[1]	92	40	347	333
	Entire Shopping Center: Calculation Purposes only	820	91,520	6,687	97	57	310	310
5	Retail B: 9.67% of Shopping Center	820	9,000	658	10	6	30	30
Total: Assuming Retail Pads A & B				4,803 [2]	242	172	515	503

[1] *Trip Generation*, ITE, 5th Edition, 1991 does not define daily trip generation rates for this land use.
[2] This does not include trip generation for Safeway Store.

B. TRIP DISTRIBUTION

Figure 5 illustrates the trip distribution assumptions used for this analysis. These assumptions are based on the existing travel patterns in the area, and the year 2015 projected number of households in the vicinity of the site (data obtained from *2015 Regional Transportation Plan*). It was also assumed that all the Pass-By trips would be made by eastbound motorists (on F/Patterson Road), who would continue eastwards after accessing the site. More detailed considerations on the trip distribution were also made, based on the location of the pads. For example, it was assumed that inbound trips from the west to pads 1 and 2 would turn right on to 29 Road, and then left in to the site from the proposed 29 Road access. However, inbound trips from the west to Pad 3 would continue straight through the intersection with 29 Road, and then turn right at one of the two proposed accesses on F Road.

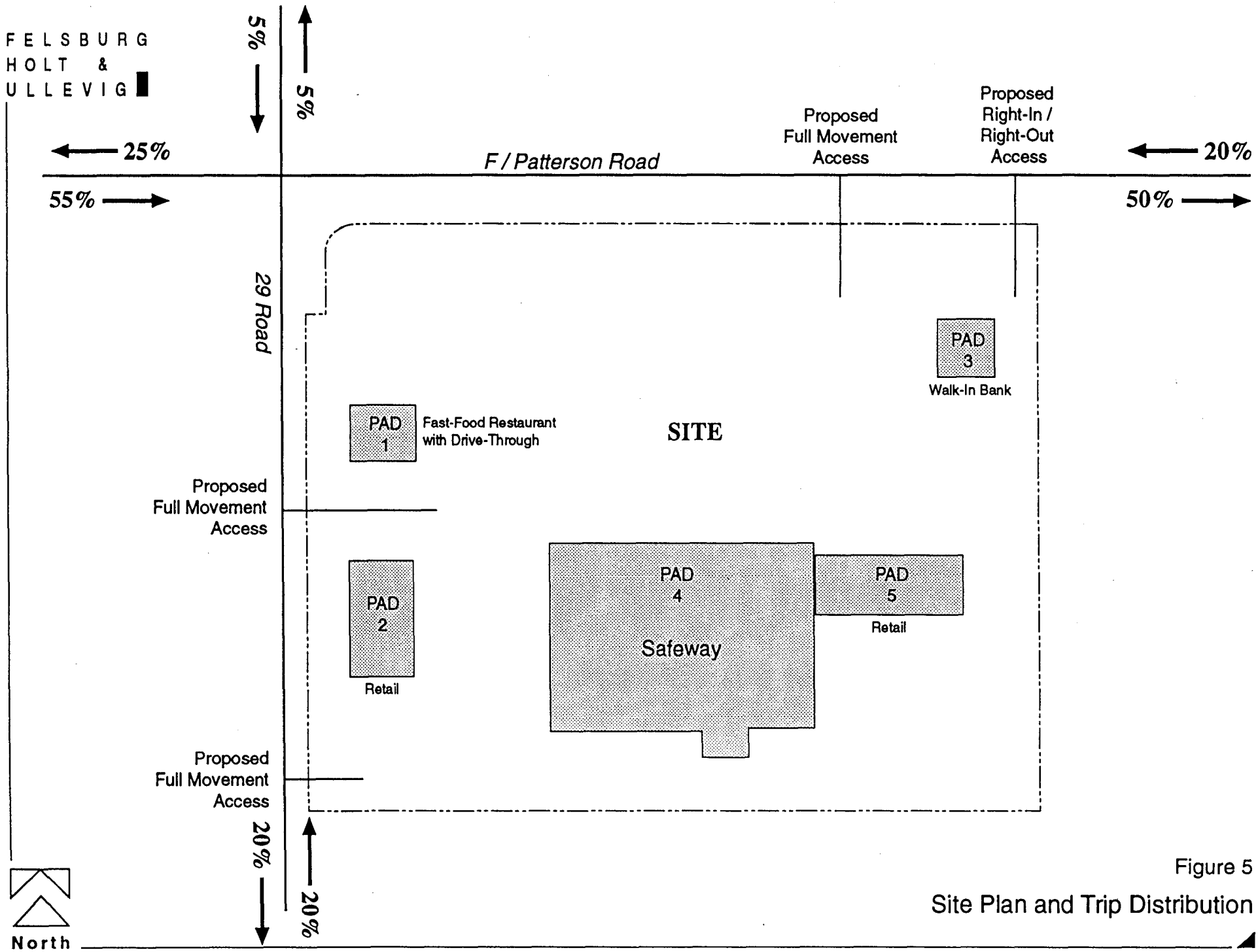

Figure 5

Site Plan and Trip Distribution

C. TRAFFIC ASSIGNMENT

PM peak hour site generated traffic volumes were assigned to the local roadway network based upon the anticipated distribution described previously, and these are shown on Figure 6. As stated earlier, 30% of the total trips were assumed as Pass-By trips, and these are responsible for the net negative numbers for the eastbound through volumes on F/Patterson Road. The calculation worksheets detailing the pad specific traffic volumes are included in Appendix A.2.

D. 2015 BACKGROUND TRAFFIC VOLUMES

Analysis of traffic impacts for a future year scenario requires projecting background traffic volumes (traffic on the roads even if the proposed development is not constructed) for that year by factoring the existing volumes by a growth percentage to reflect general traffic increases. According to the City's Development Engineer, traffic volumes in the city have been growing at an annual rate of 2.2%. Based on this information an annual growth rate of 2% was assumed, to obtain the future background volumes. These volumes, which are 48.6% (2% compounded for 20 years) greater than the existing volumes, are reported on Figure 7.

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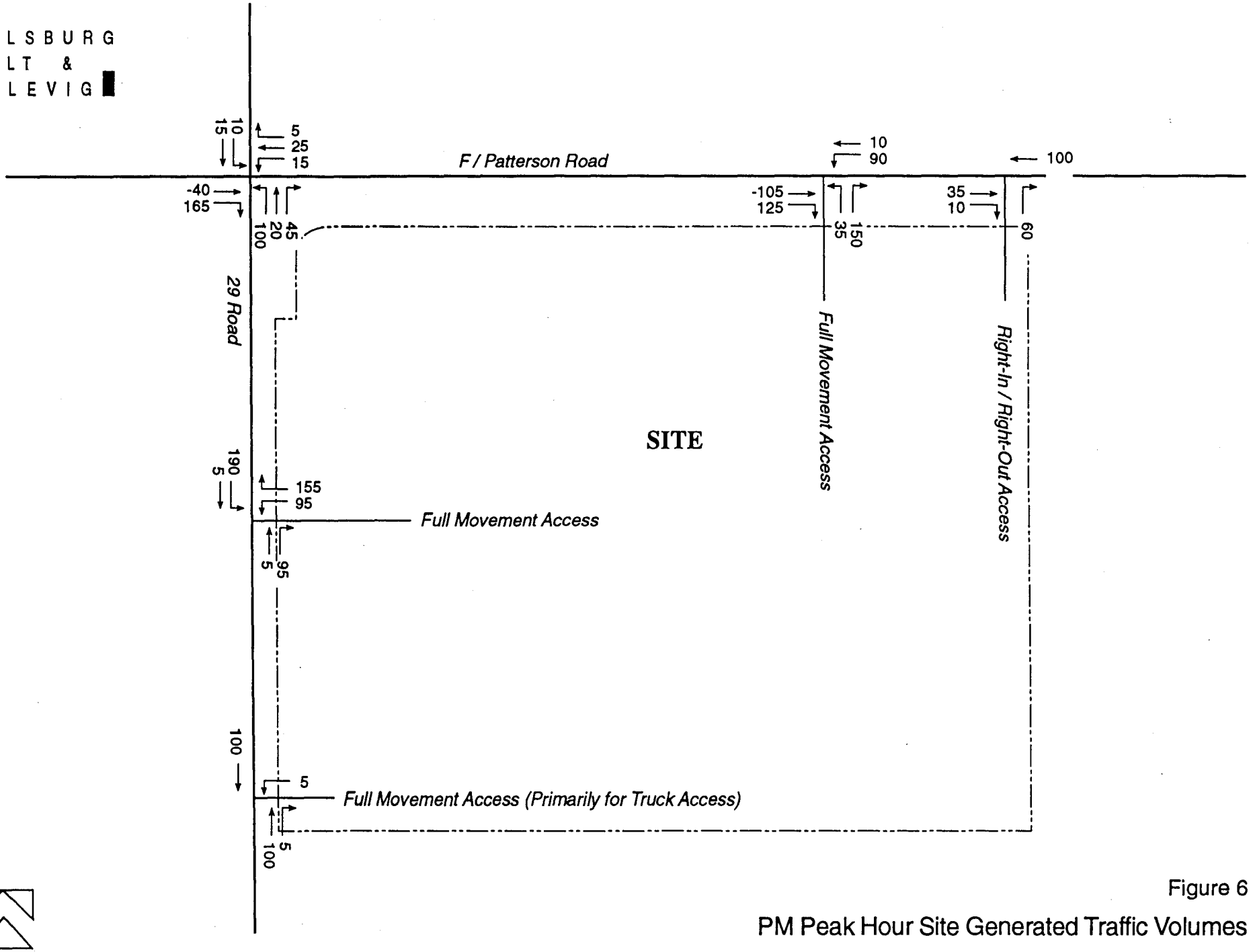

Figure 6

PM Peak Hour Site Generated Traffic Volumes

FELSBURG HOLT & ULLEVIG

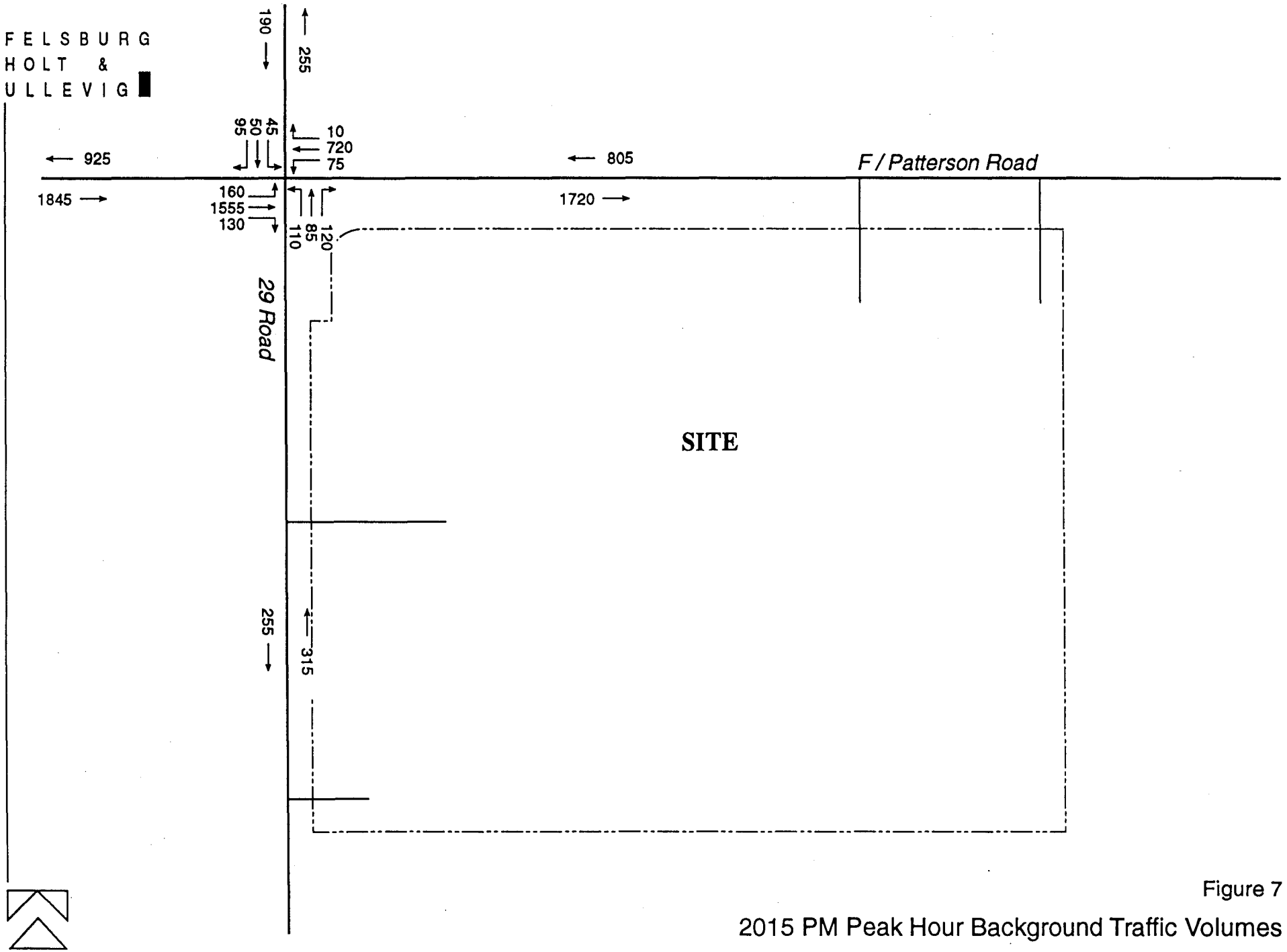

Figure 7

2015 PM Peak Hour Background Traffic Volumes

E. 2015 TOTAL VOLUMES

Total traffic volumes are a combination of the projected background traffic volumes and the site generated traffic volumes. Figure 8 represents the total projected traffic volumes for the analysis year of 2015.

F. PROJECTED TRAFFIC OPERATIONS

The projected background traffic volumes and the total traffic volumes were than analyzed using the analysis techniques described previously. The results for each intersection for the PM peak hour are presented below and on Figure 9, and the calculation worksheets are included in Appendix A.3.

1. F Road/29 Road

The analysis shows that the intersection is expected to operate at LOS B for the projected background volumes, and at LOS C for the total traffic volumes. However, it should be noted that for an optimized timing plan considered, the eastbound through-right movement is expected to operate at a volume/capacity ratio of 0.96, which represents close to unstable operation.

2. Proposed Full Movement Access on F Road/F Road

The unsignalized intersection analysis shows that the northbound left turn movement out of the site is expected to operate at LOS F. This is primarily because of the high through volumes on F Road. The westbound left turn into the site is expected to operate at LOS D, and the outbound right turn is expected to operate at LOS B.

3. Proposed Full Movement Primary Access on 29 Road

The unsignalized intersection analysis shows that the westbound left turn out of the site is expected to operate at LOS D. Additionally, the southbound left turn is expected to operate at LOS A and the northbound right turn at LOS B.

FELSBURG HOLT & ULLEVIG

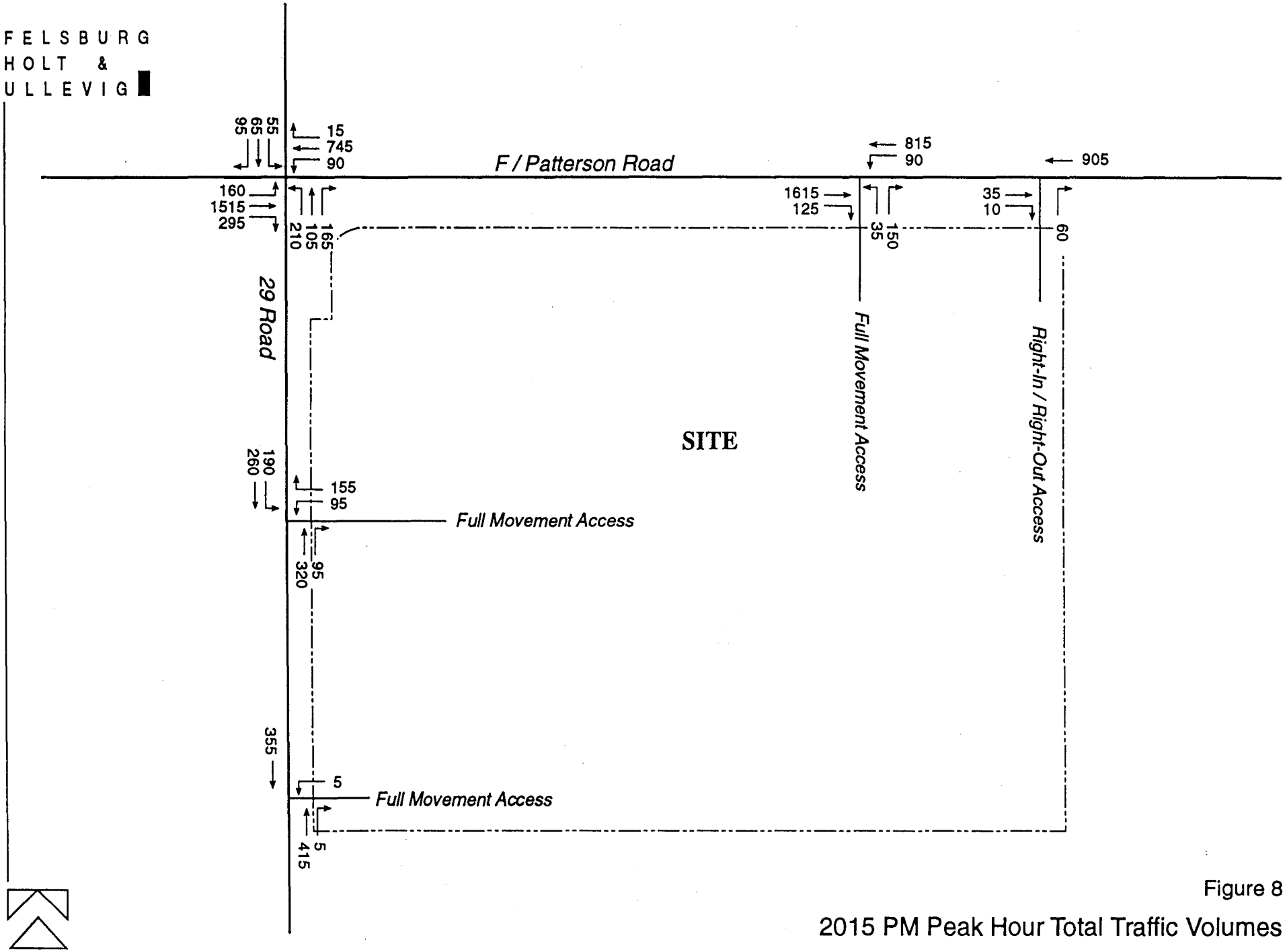

Figure 8

2015 PM Peak Hour Total Traffic Volumes

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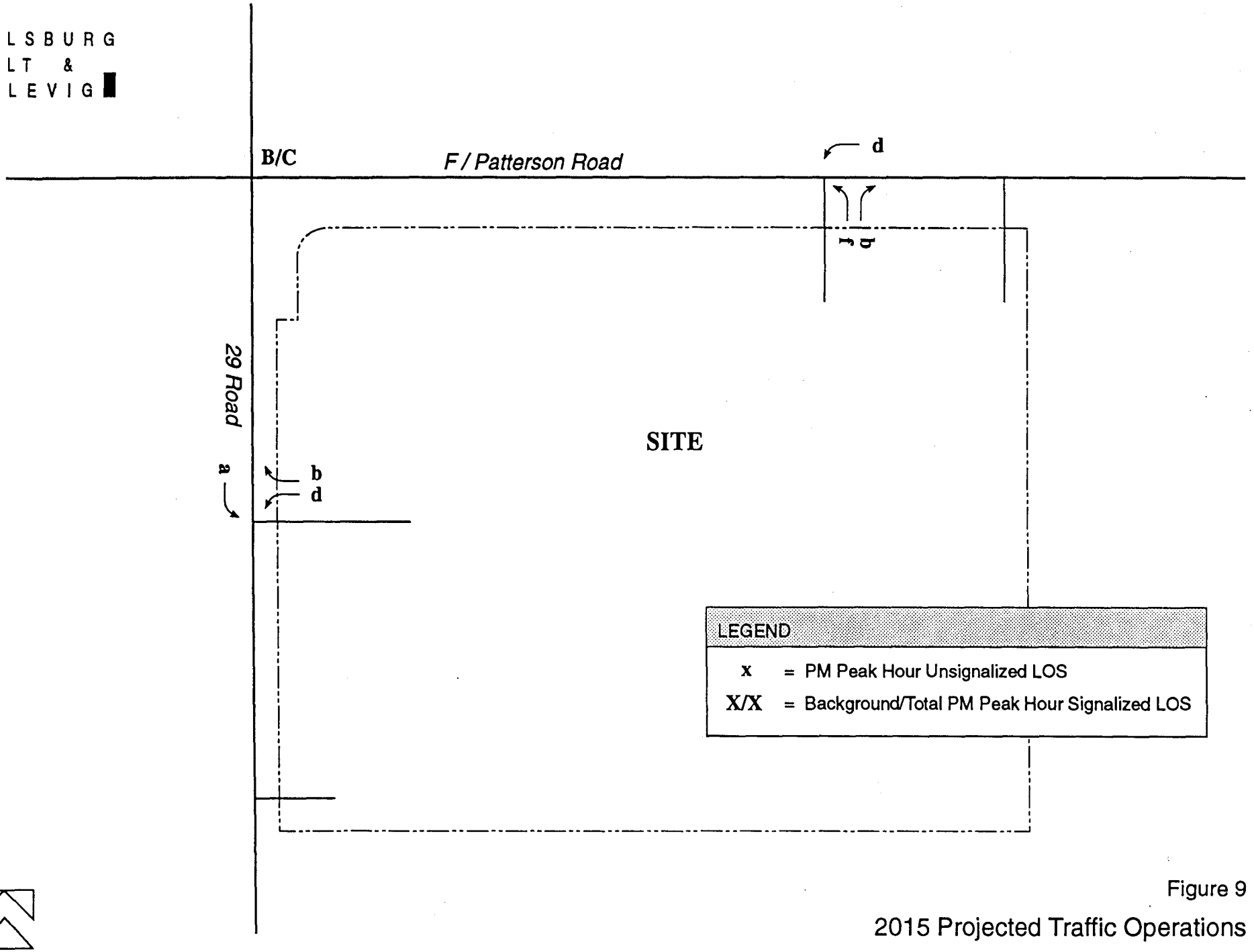


Figure 9

2015 Projected Traffic Operations

G. ACCELERATION/DECELERATION LANE LENGTHS

According to the requirements specified in the *Transportation Engineering Design Standards*, Grand Junction, 1995, deceleration and acceleration lanes are required for the right turn movements in to and out of the primary access on F Road. The posted speed limit on this roadway is 45 miles per hour, and the calculated deceleration lane length is 506 feet (includes 156 feet taper). The site plan shows that the proposed access is 600 feet away from the intersection, and thus this deceleration lane can be accommodated.

Due to the limitations of the site location, the required acceleration length can not be provided. However, it is expected that because of the proximity to the signalized intersection, there will be adequate number of opportunities for vehicles turning right on to F Road, and thus an acceleration lane need not be provided.

The proposed primary access on 29 Road marginally qualifies for the deceleration lane (right turning volume of 95 vehicles as compared to the threshold of 90 vehicles). The site plan shows that this access is 300 feet away from the secondary access on 29 Road. Thus, it is recommended that a continuous lane be constructed between these two accesses. Normally, an acceleration lane would be required for the right turns out of the primary access. However, as the signalized intersection is only 300 feet away, provision of such a lane is expected to have an insignificant effect on the traffic operation.

H. PROBLEM AREAS

Based on the analysis performed, certain problem areas have been identified, and these are discussed next.

1. Proposed Full Movement Access on F Road/F Road Intersection Operation

The unsignalized analysis has shown that the northbound left turn out of the site is expected to operate at LOS F during the PM peak hour. If this intersection is signalized, it is expected that it will operate at an acceptable level of service. Currently, signalized intersections on F Road are spaced approximately one-half mile apart, and the City has indicated that it would like to maintain this spacing. An alternative would be to consider a three-quarter access movement at this location, which would prohibit left turns out of the site on to F Road, thereby eliminating the problem movement. It is expected that motorists wanting to go left would exit at the proposed access on 29 Road (turn right) and then left at the 29 Road/F Road intersection.

2. Left Turn Storage Length Adequacy

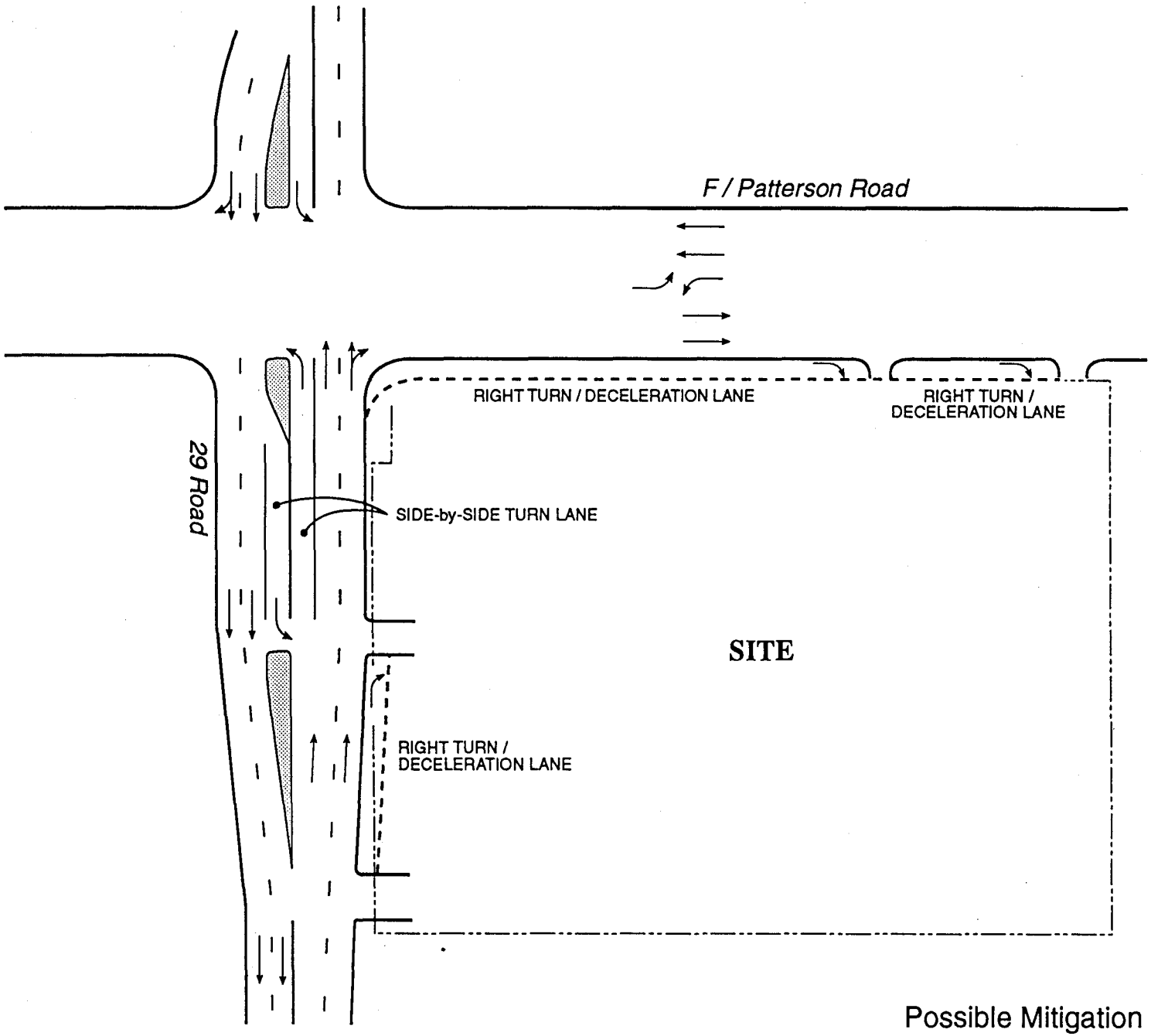
The isolated intersection analysis of 29 Road/F Road and Primary Access on 29 Road/29 Road intersections shows that these intersections can operate at an acceptable level of service. However, the left turn storage length calculation show that a minimum storage of 225 feet should be provided for the northbound left turn at 29 Road/F Road (considering left turning volume of 210 vehicles, cycle length of 100 seconds and 5% trucks). Additionally, a minimum storage of 150 feet should be provided for the southbound left turn at the proposed primary access on 29 Road. In addition to these length, an adequate taper is also required. Thus the 300 foot spacing is not adequate to accommodate of back-to-back left turn lanes.

One possible mitigation measure is to provide side-by-side turning lanes, which extend the entire length of 29 road from F Road to the proposed primary access on 29 Road. It is expected that such a configuration will require certain configuration changes on the north leg of the 29 Road/F Road intersection. A conceptual level detail of this configuration is shown on Figure 10. This configuration would provide a storage of 300 feet for the northbound left turn. This additional storage would be adequate for any extra vehicles that may perform this movement, if the access on F Road is restricted to a three-quarter movement access.

3. Access Spacing on F Road

According to the site plan, the proposed accesses on F Road are spaced 180 feet apart. Based on the estimated traffic volumes, a deceleration lane is not required for this access. However, it is recommended that a continuous lane be provided between the two accesses. This will help facilitate the movement of vehicles into the access, and will reduce the potential of conflicts with the vehicles turning right out of the primary access. This proposed configuration is also shown in Figure 10.

FELSBURG
HOLT &
ULLEVIG



North

Figure 10

Possible Mitigation Measures

IV. SUMMARY AND RECOMMENDATIONS

The Safeway Cottonwood Center development consisting of a Safeway Store, a Fast Food restaurant, a Walk-In Bank and some retail area is planned for the site located in the southeast corner of the intersection of 29 Road and F Road. Based upon growth rates expected in the vicinity of the site, the foregoing analysis of the proposed development of the site resulted in the following finding and recommendations:

- The northbound left turn at the proposed full movement unsignalized intersection on F Road is expected to operate at LOS F during the PM peak hour. Two possible options which might be considered are either signalization of this intersection, or restriction to a three-quarter movement access.

- The spacing between the proposed primary access on 29 Road and F Road is not adequate for accommodating the expected queues in back-to-back left turns. Thus, it is recommended that side-by-side left turn lanes be provided at this location, which requires one additional lane on this leg of the intersection.

- A continuous right turn/deceleration lane should be provided for the roadway segments between the two proposed accesses, both on 29 Road and F Road. Additionally, a right turn deceleration lane should be provided for proposed primary access on F Road. This lane should be provided as an additional lane from the intersection with 29 Road to the proposed primary access.

- It is expected that the eastbound right turn/through movement at the 29 Road/F Road intersection will operate at a volume/capacity ratio close to 1. This can result in unstable operation of this movement, and if necessary, a separate right-turn lane should be considered for alleviating this problem.

APPENDICES

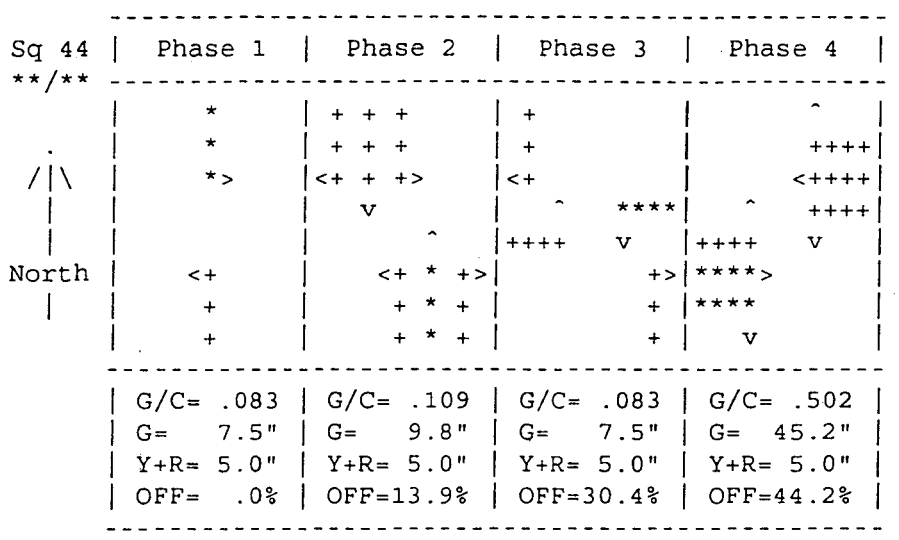
Appendix A.1 Existing Traffic Volumes: LOS Worksheets

Safeway - Grand Junction
Existing Volumes
PM Peak Hour

01/18/96
16:44:47

SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Intersection Averages for Int # 3 - 29 Road&F/Patterson Road
Degree of Saturation (v/c) .49 Vehicle Delay 10.9 Level of Service B



C= 90 sec G= 70.0 sec = 77.8% Y=20.0 sec = 22.2% Ped= .0 sec = .0%

Lane Group	Width/ Lanes	g/C Reqd	g/C Used	Service Rate @C (vph)	Service Rate @E	Adj Volume	v/c	HCM Delay	LOS	90% Max Queue
N Approach								17.8	C+	
RT	12/1	.110	.270	328	428	71	.166	16.2	C+	66 ft
TH	12/1	.085	.131	126	237	38	.155	22.4	C	42 ft
LT	12/1	.000	.105	290	381	33	.087	15.8	*C+	30 ft
S Approach								18.1	C+	
RT	12/1	.122	.270	328	428	89	.208	16.4	C+	82 ft
TH	12/1	.097	.131	126	237	62	.253	22.8	*C	68 ft
LT	12/1	.000	.105	318	415	83	.200	16.3	C+	77 ft
E Approach								7.7	B+	
TH+RT	24/2	.203	.524	1906	1950	573	.294	7.8	B+	172 ft
LT	12/1	.003	.105	219	270	56	.207	6.2	*B+	25 ft
W Approach								10.4	B	
TH+RT	24/2	.387	.524	1887	1931	1322	.685	11.0	*B	398 ft
LT	12/1	.000	.105	412	440	119	.270	3.9	A	51 ft

Appendix A.2 Trip Distribution for Individual Pads

FELSBURG HOLT & ULLEVIG

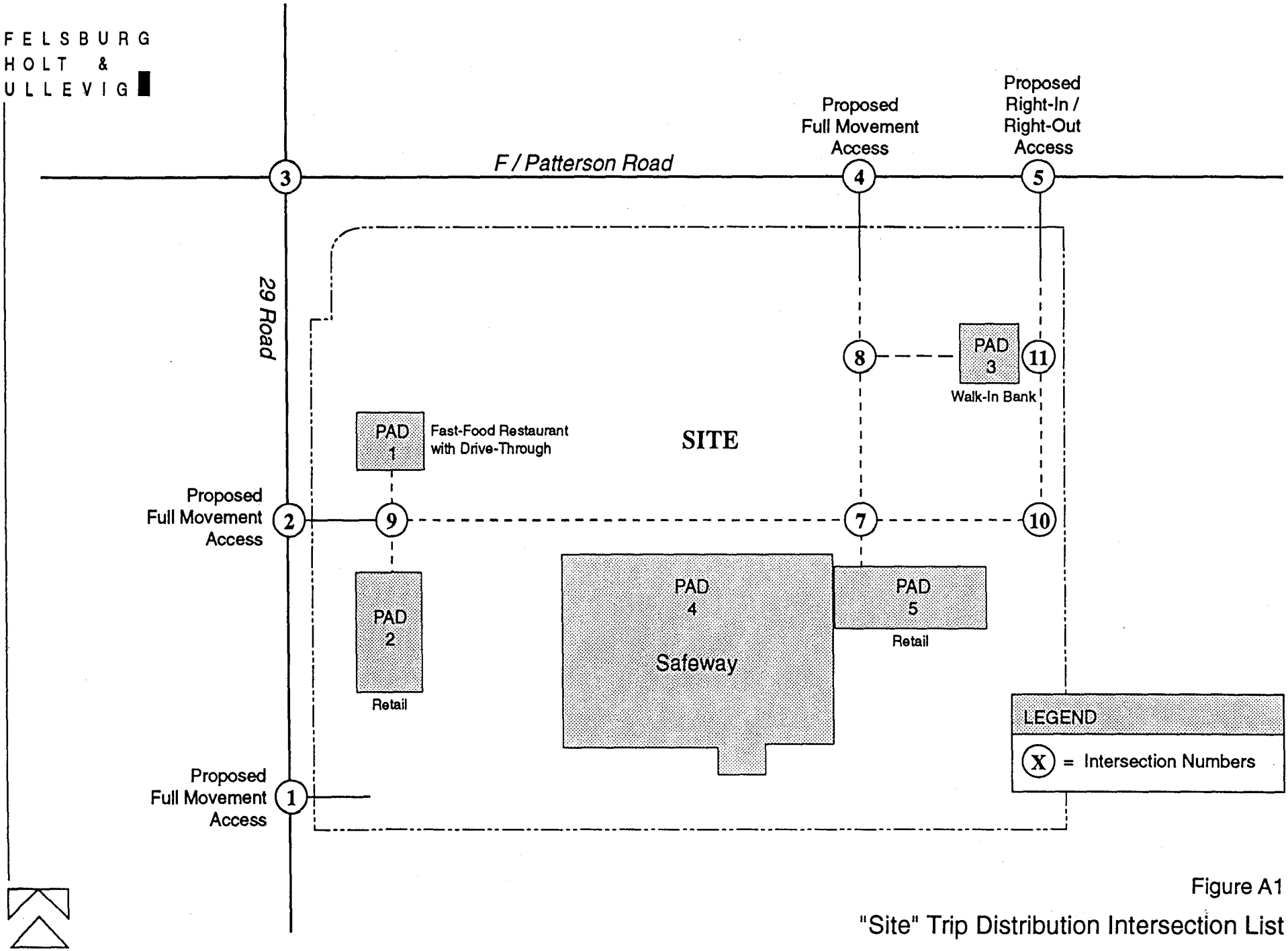


Figure A1

"Site" Trip Distribution Intersection List

Safeway - Grand Junction 01/17/96
Southwest Corner of F Road & 29 Road 14:05:16
All Pads: Pass By Trips (55% of Inbound from West at 3,4,5)

SITE/TEAPAC - Intersection Movement Volumes

	North			East			South			West			Int
Int	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Description
1	0	100	0	0	0	5	5	100	0	0	0	0	29 Road&Southmost Access
2	0	5	190	155	0	95	95	5	0	0	0	0	29Road&Main Access on 29
3	0	15	10	5	25	15	45	20	100	165	-40	0	29Road&F/Patterson Road
4	0	0	0	0	10	90	150	0	35	125	-105	0	Main Access on F&F Road
5	0	0	0	0	100	0	60	0	0	10	35	0	Sec. Access on F&F Road
6	0	345	30	30	0	0	0	335	0	0	0	0	Main Access on F&Sfwy +
7	15	190	0	0	0	0	45	160	160	190	0	10	Main Access on F&Main Ac
8	0	200	15	15	0	5	0	170	0	0	0	0	Main Access on F&Pad 1 W
9	65	0	10	10	165	5	5	0	25	25	190	70	Pads 2+3 Access&Main Acc
10	0	0	0	0	0	0	0	0	0	0	0	45	Sec. Acc on F&Main Acc o
11	10	0	0	0	0	0	0	45	0	0	0	15	Sec. Ac on F&Pad 1 E. Ac

The above volumes are rounded to the nearest 5 vehicles per hour.

Safeway - Grand Junction 01/17/96
Southwest Corner of F Road & 29 Road 13:02:48
Pad 3: Walk-In Bank (Previously Site 1)

SITE/TEAPAC - Distribution Types and Factors

Typ	Base	Gener	Dst	Trips	Description
1	3	9.00	5	1	In from the North
2	3	9.00	20	5	In from the East
3	3	9.00	20	5	In from the South
4	3	9.00	55	15	In from the West
5	3	11.67	5	2	Out ot the North
6	3	11.67	50	18	Out to the East
7	3	11.67	20	7	Out to the South
8	3	11.67	25	9	Out to the West
99		1.000	1	1.000	Non-site traffic with growth factor

SITE/TEAPAC - Intersection Movement Volumes

	North			East			South			West			Int
Int	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Description
1	0	8	0	0	0	0	0	6	0	0	0	0	29 Road&Southmost Access
2	0	4	0	0	0	4	0	6	0	0	0	0	29Road&Main Access on 29
3	0	0	2	2	9	4	6	0	0	0	14	0	29Road&F/Patterson Road
4	0	0	0	0	0	5	2	0	15	11	11	0	Main Access on F&F Road
5	0	0	0	0	5	0	16	0	0	11	2	0	Sec. Access on F&F Road
6	0	0	0	0	0	0	0	0	0	0	0	0	Main Access on F&Sfwy +
7	4	0	0	0	0	0	0	0	0	0	0	0	Main Access on F&Main Ac
8	0	0	16	17	0	4	0	0	0	0	0	0	Main Access on F&Pad 1 W
9	0	0	0	0	4	0	0	0	0	0	0	0	Pads 2+3 Access&Main Acc
10	0	0	0	0	0	0	0	0	0	0	0	0	Sec. Acc on F&Main Acc o
11	11	0	0	0	0	0	0	0	0	0	0	16	Sec. Ac on F&Pad 1 E. Ac

Safeway - Grand Junction 01/17/96
Southwest Corner of F Road & 29 Road 13:11:15
Pad 5: Retail B: 9000 sq. ft. (previously Site 5)

SITE/TEAPAC - Distribution Types and Factors

Typ	Base	Gener	Dst	Trips	Description
1	9	3.33	5	1	In from the North
2	9	3.33	20	6	In from the East
3	9	3.33	20	6	In from the South
4	9	3.33	55	16	In from the West
5	9	3.33	5	1	Out ot the North
6	9	3.33	50	15	Out to the East
7	9	3.33	20	6	Out to the South
8	9	3.33	25	7	Out to the West
99		1.000	1	1.000	Non-site traffic with growth factor

SITE/TEAPAC - Intersection Movement Volumes

	North			East			South			West			Int
Int	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Description
1	0	6	0	0	0	0	0	6	0	0	0	0	29 Road&Southmost Access
2	0	0	9	7	0	6	6	0	0	0	0	0	29Road&Main Access on 29
3	0	1	1	1	1	0	0	1	6	8	8	0	29Road&F/Patterson Road
4	0	0	0	0	0	6	4	0	2	9	0	0	Main Access on F&F Road
5	0	0	0	0	6	0	11	0	0	0	4	0	Sec. Access on F&F Road
6	0	0	30	30	0	0	0	0	0	0	0	0	Main Access on F&Sfwy +
7	0	15	0	0	0	0	11	6	13	15	0	0	Main Access on F&Main Ac
8	0	15	0	0	0	0	0	6	0	0	0	0	Main Access on F&Pad 1 W
9	0	0	0	0	13	0	0	0	0	0	15	0	Pads 2+3 Access&Main Acc
10	0	0	0	0	0	0	0	0	0	0	0	11	Sec. Acc on F&Main Acc o
11	0	0	0	0	0	0	0	11	0	0	0	0	Sec. Ac on F&Pad 1 E. Ac

Safeway - Grand Junction 01/17/96
Southwest Corner of F Road & 29 Road 13:33:48
All Pads: Pass By Trips (55% of Inbound from West at 3,4,5)

SITE/TEAPAC - Distribution Types and Factors

Typ	Base	Gener	Dst	Trips	Description
1	-515	1.00	5	-25	In from the North
2	-515	1.00	20	-102	In from the East
3	-515	1.00	20	-102	In from the South
4	-515	1.00	55	-282	In from the West
5	-515	1.00	5	-25	Out ot the North
6	-515	1.00	50	-257	Out to the East
7	-515	1.00	20	-102	Out to the South
8	-515	1.00	25	-128	Out to the West
99		1.000	1	1.000	Non-site traffic with growth factor

SITE/TEAPAC - Intersection Movement Volumes

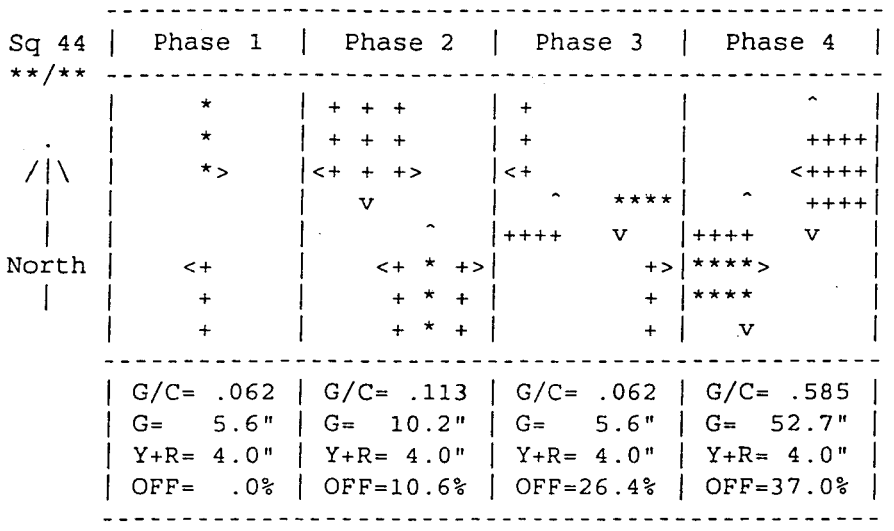
	North			East			South			West			Int
Int	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Description
1	0	0	0	0	0	0	0	0	0	0	0	0	29 Road&Southmost Access
2	0	0	0	0	0	0	0	0	0	0	0	0	29Road&Main Access on 29
3	0	0	0	0	0	0	0	0	0	0-156		0	29Road&F/Patterson Road
4	0	0	0	0	0	0	0	0	0	0-156		0	Main Access on F&F Road
5	0	0	0	0	0	0	0	0	0	0-156		0	Sec. Access on F&F Road
6	0	0	0	0	0	0	0	0	0	0	0	0	Main Access on F&Sfwy +
7	0	0	0	0	0	0	0	0	0	0	0	0	Main Access on F&Main Ac
8	0	0	0	0	0	0	0	0	0	0	0	0	Main Access on F&Pad 1 W
9	0	0	0	0	0	0	0	0	0	0	0	0	Pads 2+3 Access&Main Acc
10	0	0	0	0	0	0	0	0	0	0	0	0	Sec. Acc on F&Main Acc o
11	0	0	0	0	0	0	0	0	0	0	0	0	Sec. Ac on F&Pad 1 E. Ac

Appendix A.3 2015 Traffic Volumes: LOS Worksheets

Safeway - Grand Junction 01/17/96
2015 Background Volumes 17:59:41
PM Peak Hour

SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Intersection Averages for Int # 3 - 29 Road&F/Patterson Road
Degree of Saturation (v/c) .67 Vehicle Delay 12.7 Level of Service B



C= 90 sec G= 74.0 sec = 82.2% Y=16.0 sec = 17.8% Ped= .0 sec = .0%

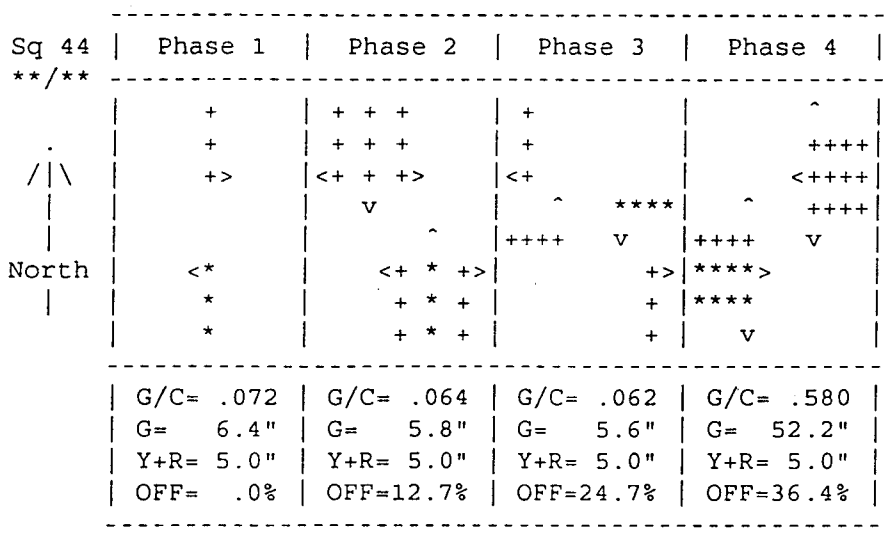
Lane Group	Width/ Lanes	g/C Reqd	g/C Used	Service Rate @C (vph)	Service Rate @E	Adj Volume	v/c	HCM Delay	LOS	90% Max Queue
N Approach								19.6	C+	
RT	12/1	.134	.230	261	365	106	.290	18.6	C+	103 ft
TH	12/1	.094	.124	112	222	57	.247	23.1	C	63 ft
LT	12/1	.000	.073	192	273	50	.181	17.8	*C+	49 ft
S Approach								20.3	C	
RT	12/1	.151	.230	261	365	132	.362	19.1	C+	129 ft
TH	12/1	.113	.124	112	222	92	.398	24.1	*C	102 ft
LT	12/1	.017	.073	225	318	123	.386	18.9	C+	120 ft
E Approach								6.6	B+	
TH+RT	24/2	.270	.596	2204	2218	852	.384	6.2	B+	217 ft
LT	12/1	.017	.073	163	209	82	.387	11.3	*B	50 ft
W Approach								13.4	B	
TH+RT	24/2	.544	.596	2181	2196	1966	.895	14.0	*B	502 ft
LT	12/1	.034	.073	242	274	177	.646	7.6	B+	67 ft

Safeway - Grand Junction
2015 Total Volumes: Original Access Plan
PM Peak Hour

01/17/96
18:19:01

SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Intersection Averages for Int # 3 - 29 Road&F/Patterson Road
Degree of Saturation (v/c) .74 Vehicle Delay 17.6 Level of Service C+



C= 90 sec G= 70.0 sec = 77.8% Y=20.0 sec = 22.2% Ped= .0 sec = .0%

Lane Group	Width/ Lanes	g/C Reqd	g/C Used	Service Rate @C (vph)	Service Rate @E	Adj Volume	v/c	HCM Delay	L S	90% Max Queue
N Approach								21.7	C	
RT	12/1	.134	.204	217	322	106	.328	20.0	C+	107 ft
TH	12/1	.103	.086	41	148	73	.453	26.7	D+	84 ft
LT	12/1	.025	.094	170	244	61	.245	18.8	C+	61 ft
S Approach								30.4	D+	
RT	12/1	.182	.204	217	322	182	.563	22.5	C	183 ft
TH	12/1	.125	.086	41	148	114	.708	34.7	*D	132 ft
LT	12/1	.117	.094	193	277	234	.836	34.5	*D	233 ft
E Approach								6.8	B+	
TH+RT	24/2	.279	.602	2226	2238	887	.396	6.1	B+	223 ft
LT	12/1	.030	.084	175	229	99	.427	13.3	*B	71 ft
W Approach								18.8	C+	
TH+RT	24/2	.586	.602	2176	2189	2110	.964	19.8	*C+	531 ft
LT	12/1	.039	.084	250	286	177	.619	6.8	B+	63 ft

Center For Microcomputers In Transportation
HCS: Unsignalized Intersection Release 2.1 Page 1
****

File Name 2TOT1.HC0
Streets: (N-S) Access on 29 Road (E-W) 29 Road
Major Street Direction.... NS
Length of Time Analyzed... 60 (min)
Analyst..... PM
Date of Analysis..... 1/17/96
Other Information..... 2015 Total Volumes: Original Access Plan

Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	1	2	0	0	0	0	1	0	1
Stop/Yield			Y			Y						
Volumes		318	95	190	246					95		155
PHF		.95	.95	.95	.95					.95		.95
Grade		0			0			0			0	
MC's (%)		0	0	0	0					0		0
SU/RV's (%)		0	0	0	0					0		0
CV's (%)		0	0	0	0					0		0
PCE's		1.1	1.1	1.1	1.1					1.1		1.1

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	159	
Potential Capacity: (pcph)	1150	
Movement Capacity: (pcph)	1150	
Prob. of Queue-free State:	0.84	

Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	318	
Potential Capacity: (pcph)	1157	
Movement Capacity: (pcph)	1157	
Prob. of Queue-free State:	0.81	

Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	754	
Potential Capacity: (pcph)	349	
Major LT, Minor TH Impedance Factor:	0.81	
Adjusted Impedance Factor:	0.81	
Capacity Adjustment Factor due to Impeding Movements	0.81	
Movement Capacity: (pcph)	283	

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
WB	L	110	283		20.8	D	10.2
WB	R	179	1150		3.7	A	
SB	L	220	1157		3.8	A	1.7

Intersection Delay = 3.0

****

File Name 4TOT1.HC0
Streets: (N-S) Access on F Road (E-W) F/Patterson Road
Major Street Direction.... EW
Length of Time Analyzed... 60 (min)
Analyst..... PM
Date of Analysis..... 1/17/96
Other Information..... 2015 Total Volumes: Original Access Plan

Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	1	2	0	1	0	1	0	0	0
Stop/Yield			Y			N						
Volumes		1610	125	90	814		35		150			
PHF		.95	.95	.95	.95		.95		.95			
Grade		0			0			0			0	
MC's (%)		0	0	0	0		0		0			
SU/RV's (%)		0	0	0	0		0		0			
CV's (%)		0	0	0	0		0		0			
PCE's		1.1	1.1	1.1	1.1		1.1		1.1			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.50	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.50	3.30
Left Turn Minor Road	7.00	3.40

WorkSheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	805	
Potential Capacity: (pcph)	541	
Movement Capacity: (pcph)	541	
Prob. of Queue-free State:	0.68	

Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	1610	
Potential Capacity: (pcph)	234	
Movement Capacity: (pcph)	234	
Prob. of Queue-free State:	0.55	

Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	2514	
Potential Capacity: (pcph)	26	
Major LT, Minor TH Impedance Factor:	0.55	
Adjusted Impedance Factor:	0.55	
Capacity Adjustment Factor due to Impeding Movements	0.55	
Movement Capacity: (pcph)	14	

Intersection Performance Summary

Movement		FlowRate v(pcph)	MoveCap Cm(pcph)	SharedCap Csh(pcph)	Avg.Total Delay	LOS	Delay By App
NB	L	41	14	*		F	780.4
NB	R	174	541		9.8	B	
WB	L	105	234		27.8	D	2.8

Intersection Delay = 52.0

* The calculated delay was greater than 999.9 sec.

Footnotes for Safeway Cottonwood Centre Subdivision:

(1) There should be more current data on the class 6 basecourse. I,m positive that there is a more current proctor value for a T180 than the one submitted. Gradations should be run as the job progresses to assure delivery of spec material.

The concrete mix design is acceptable although I believe that it is a 1994 design. I don't think that materials have changed much to adversely effect the concrete. Testing will be conducted on the end product to assure that anyway.

I talked to Gary DeJarnatt on 6/19/96 about current asphalt designs. The -1/2" design has no Lottman results and will be amended prior to any paving requiring a 50 blow Marshall. I was also informed that United plans to produce a 75 blow, grading "C" mix that will meet the new City specs. Hopefully the blend will be finished within a month of our conversation. I was also informed that they do plan to use a liquid antistrip on that mix.

SUBSURFACE SOILS EXPLORATION

SAFEWAY

GRAND JUNCTION, COLORADO

Prepared For:

SAFEWAY INCORPORATED
6900 S. Yosemite Street
Englewood, Colorado

Prepared By:

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

January 31, 1996

Lincoln DeVore, Inc.
Geotechnical Consultants
1441 Motor St.
Grand Junction, CO 81505
TEL: (970) 242-8968
FAX: (970) 242-1561

January 31, 1996

Safeway Incorporated
6900 S. Yosemite Street
Englewood, CO 80112

Re: SUBSURFACE SOILS EXPLORATION

SAFEWAY

Grand Junction, Colorado

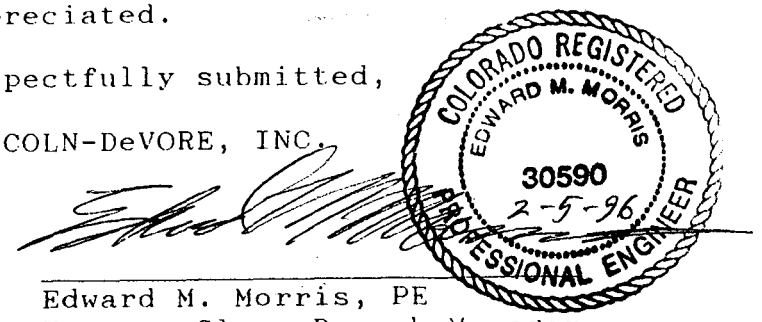
Dear Sir:

Transmitted herein are the results of a Subsurface Soils Exploration for the proposed construction of a fairly large retail commercial building which will house a Safeway Store and 3 or 4 smaller building pads for commercial structures.

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

Respectfully submitted,

LINCOLN-DeVORE, INC.



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

LDTL Job No. 84768-J

EMM/bh

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INTRODUCTION

PROJECT DESCRIPTION

This report presents the results of our geotechnical evaluation performed to determine the general subsurface conditions of the site applicable to construction of a fairly large retail commercial building which will house a Safeway Store and 3 or 4 smaller building pads for commercial structures. A vicinity map is included in the Appendix of this report.

To assist in our exploration, we were provided with a preliminary site plan noted as Plan #6, dated 12-20-95. The Boring Location Plan attached to this report is based on that plan provided to us.

We understand that the proposed structure will probably consist of a single story, steel framed structure with no basement and concrete floor slab on grade. It is also anticipated the smaller retail structures on this site will have similar construction. Lincoln DeVore has not seen a full set of building plans, but structures of this type typically develop wall loads on the order of 1000-2500 plf and column loads on the order of 16-26 kips.

The characteristics of the subsurface materials encountered were evaluated with regard to the type of construction described above. Recommendations are included herein to match the described construction to the soil characteristics found. The information contained herein may or may not be valid for other purposes. If the proposed site use is changed or

types of construction proposed, other than noted herein, Lincoln DeVore should be contacted to determine if the information in this report can be used for the new construction without further field evaluations.

PROJECT SCOPE

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

This report provides site specific information for the construction of a fairly large retail commercial structure and several smaller, detached retail structures. Included in this report are recommendations regarding general site development and foundation design criteria.

The scope of our geotechnical exploration consisted of a surface reconnaissance, subsurface exploration, obtaining representative samples, laboratory testing, analysis of field and laboratory data, and a review of geologic literature.

Specifically, the intent of this study is to:

1. Explore the subsurface conditions to the depth expected to be influenced by the proposed construction.

2. Evaluate by laboratory and field tests the general engineering properties of the various strata which could influence the development.

3. Define the general geology of the site including likely geologic hazards which could have an effect on site development.

4. Develop geotechnical criteria for site grading and earthwork.

5. Identify potential construction difficulties and provide recommendations concerning these problems.

6. Recommend an appropriate foundation system for the anticipated structure and develop criteria for foundation design.

FIELD EXPLORATION AND LABORATORY TESTING

A field evaluation was performed on 1-16-96, 1-23-96 & 1-29-96, and consisted of a site reconnaissance by our geotechnical personnel and the drilling of 12 shallow to medium depth exploration borings. These 12 exploration borings were drilled in or near the proposed buildings near the locations selected by representatives of Safeway Inc., and are indicated on the Boring Location Plan. The exploration borings were located to obtain a reasonably good profile of the subsurface soil conditions. All exploration borings were drilled using a CME 45-B, truck mounted drill rig with continuous flight auger to depths of approximately 10-45 feet. The shallower holes were within the proposed parking areas and the deeper holes were continued to the anticipated bearing strata beneath all structures. Samples were taken with a standard split spoon sampler, thin walled Shelby tubes, lined California type sampler and by bulk methods. Logs describing the subsurface conditions are presented in the attached figures.

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

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

The following laboratory tests were performed on representative soil samples to determine their relative engineering properties.

ASTM D-2487	Soil Classification
ASTM D-2435	One Dimensional Consolidation
ASTM D-2937	In-Place Soil Density
ASTM D-2216	Moisture Content of Soil
ASTM D-2844	R-Value of Soils (Hveem-Carmany)

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

FINDINGS

SITE DESCRIPTION

The project site is located in the Northwest Quarter of the Northwest Quarter of Section 8, Township 1 South, Range 1 East of the Ute Principal Meridian, Mesa County, Colorado. More specifically the site is located in the Southeast corner of the intersection of Patterson (F) Road and 29 Road, within the corporate limits of the City of Grand Junction. The tract is bounded on the North by Patterson Road and on the West by 29 Road. The approximate site measurements are 745' along Patterson Road and approximately 610' along 29 Road. The tract is approximately rectangular.

The topography of the site is relatively flat, being located on the lower reaches of a very broad debris fan feature. The ground surface in the vicinity of the site has an overall gradient to the South. The exact direction of surface runoff on this site will be controlled to an extent by the proposed new construction and will be variable. Surface and subsurface drainage on this site can be described as fair to poor.

GENERAL GEOLOGY AND SUBSURFACE DESCRIPTION

The geologic materials encountered under the site consist of approximately 20' to in excess of 42' of soft, unconsolidated alluvial soils which cover the Mancos Shale Formation. The Mancos Shale Formation is part of a very thick sequence of sedimentary rocks which underlie the Grand Junction area. The geologic and engineering properties of the materials

found in our 12 exploration borings will be discussed in the following sections.

The soils on this site consist of the Mancos Shale Formation bedrock, cover with covered with alluvium/ colluvium transported by mudflows from the hills to the North-Northeast. Generally, the alluvial silts and clays are soft, wet and of low density. Soil density decreases and the moisture content increases with increasing depth. The upper 1-4 feet of the soil profile are stiffer and relatively dry due to surface desiccation.

The site is immediately East of the present flow channel of Indian Wash. Indian Wash originates in the Bookcliffs to the North/Northeast and is the source of the soft, debris fan deposits on this site. In general, it is believed the original channel of Indian Wash was quite erratic and formed several gully features in the Ancient Mancos Shale Formation surface. It is believed the main flow channel of Indian Wash at one time flowed near the Eastern portion of this property, but undoubtably has moved from East to West in several episodes. This variability of major flow channels is a characteristic of debris fan features.

The surface soils on this site consist of a series of silty clay and sandy clay soils which are a product of mud flow/debris flow features which originate on the south-facing slopes of the Bookcliffs. These mud flow/debris flow features are a small part of a very extensive mud flow/debris flow complex along the base of the Bookcliffs and

extending to the Colorado River. Utilizing recent events and standard evaluation techniques, this tract is not considered to be within with an active debris flow hazard area.

The surface soils are an erosional product of the upper Mancos Shale and the Mount Garfield Formations which are exposed on the slopes of the Bookcliffs. The soils contained within these mud flow/debris flow features normally exhibit a metastable condition which can range from very slight to severe. Metastable soil is subject to internal collapse and is very sensitive to changes in the soil moisture content. Based on the field and laboratory testing of the soils on this site, the severity of the metastable soils can be described as slight.

The primary soil encountered under this site is a dark brown to gray brown silt and clay mixture. The soils are quite similar but due to stratification, have been divided into two subsoils designated types I & II for purposes of this report.

Soil Type I was classified as a sandy, occasionally gravelly very silty clay (ML-CL) under the Unified Classification System. The gravel contained within this soil are fragments of siltstone and sandstone from the Bookcliffs to the North, which had been incorporated in the mudflows. This material is of low plasticity, of low to moderate permeability, and was encountered in a low density, moist to saturated condition. If this soil is found in a relatively dry condition, it may undergo mild expansion with the entry of small amounts of moisture, but

will undergo long-term consolidation upon the addition of larger amounts of moisture. This soil will settle after being loaded. The maximum allowable bearing capacity for this soil was found to be 950 psf, with 100 minimum dead load pressure required. Some strata of these soils, containing significant amounts of sand and gravel, may exhibit somewhat higher bearing capacities, which is only a localized conditions. The finer grained portion of Soil Type No. I contains sulfates in detrimental quantities.

Soil Type II was classified as a silty clay (ML-CL) under the Unified Classification System. This material is of low plasticity, of low to moderate permeability, and was encountered in a low to very low density, moist to saturated condition. If this soil is found in a relatively dry condition, it may undergo mild expansion with the entry of small amounts of moisture, but will undergo long-term consolidation upon the addition of larger amounts of moisture. This soil will settle after being loaded. The maximum allowable bearing capacity for this soil was found to be 950 psf, with 100 minimum dead load pressure required. The finer grained portion of Soil Type No. II contains sulfates in detrimental quantities.

The surface soils are deposited over the dense formational material of the Mancos Shale of Cretaceous Age. The Mancos Shale is described as a thinbedded, drab, light to dark gray marine shale, with thinly interbedded fine grain sandstone and siltstone layers. Some portions of the Mancos Shale are bentonitic, and therefore, are highly expansive. The majority of the shale, however, has only a low to moderate expansion potential. The formational shale was encountered in the 8

deeper test borings at depths ranging from 20' on the West side to 42-1/2' in the Southeast corner of the tract. It is anticipated that this formational shale will affect the construction and the performance of the foundations on the site.

The Mancos Shale Formation is often highly fractured, with fillings of soluble sulfate salts being very common. The samples obtained in this drilling program indicated many of the fractured faces and bedding planes in the shale contain sulfate salt deposits. Some seams of sulfate salts up to 1/4 inch thick were observed in the upper 2' of the Weathered Mancos Shale, at the contact between the shale and the overlying unconsolidated soils.

GROUND WATER:

A free water table came to equilibrium during drilling at depths ranging from 6 feet to 11 feet below the present ground surface. This is probably not a true phreatic surface but is an accumulation of subsurface seepage moisture (perched water). In our opinion the subsurface water conditions shown are a permanent feature on this site. The depth to free water would be subject to fluctuation, depending upon external environmental effects.

Sulfate Salts exhibit variable strength, depending upon surrounding moisture conditions and their chemistry as related to water. In addition, Sulfate Salts are soluble and may be physically removed from the soil by ground moisture conditions. Such removal may leave significant amounts of void

areas within the Mancos Shale, which may affect the load bearing capacity of the formation. Many of the fractures in the Mancos Shale Formation are open, allowing the rapid transmission of water to occur. Some sandstone and siltstone strata within the Mancos Shale Formation also exhibit elevated permeability.

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

Data presented in this report concerning ground water levels are representative of those levels at the time of our field exploration. Groundwater levels are subject to change seasonally or by changed environmental conditions. Quantitative information concerning rates of flow into excavations or pumping capacities necessary to dewater excavations is not included and is beyond the scope of this report. If this information is desired, permeability and field pumping tests will be required.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL DISCUSSION

No geologic conditions were apparent during our reconnaissance which would preclude the site development as planned, provided the recommendations contained herein are fully complied with. Based on our investigation to date and the knowledge of the proposed construction, the site condition which would have the greatest effect on the planned development is the relatively high ground water table and the associated very soft, compressible soils.

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

OPEN FOUNDATION OBSERVATION

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

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

EXCAVATION & STRUCTURAL FILL:

Subgrade

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

Structural Fill

In general, we recommend all structural fill in the area beneath any proposed structure or roadway be compacted to a minimum of 90% of its maximum modified Proctor dry density (ASTM D1557). We recommend that fill be placed and compacted at approximately its optimum moisture content (+/-2%) as

determined by ASTM D 1557. Structural fill should be a granular, coarse grained, non-free draining, non-expansive soil. This structural fill should be placed in the overexcavated portion of this site in lifts not to exceed 6 inches after compaction. This Structural Fill must be brought to the required density by mechanical means. No soaking, jetting or puddling techniques of any type should be used in placement of fill on this site.

Non-Structural Fill

We recommend that all backfill placed around the exterior of the building, and in utility trenches which are outside the perimeter of the building and not located beneath roadways or parking lots, be compacted to a minimum of 80% of its maximum modified Proctor dry density (ASTM D-1557).

Fill Limits

To provide adequate lateral support, we recommend that the zone of overexcavation extend at least 3 feet beyond the perimeter of the building on all sides. The Structural Fill should be a minimum of 3 feet in final compacted thickness.

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

Field Observation & Testing:

During the placement of any structural fill, it is recommended that a sufficient amount of field tests and observation be performed under the direction of the geotechnical engineer. The geotechnical engineer should determine the amount of observation time and field density tests required to determine substantial conformance with these recommendations. It is recommended that surface density tests be taken at maximum 2 foot vertical interval.

The opinions and conclusions of a geotechnical report are based on the interpretation of information obtained by random borings. Therefore the actual site conditions may vary somewhat from those indicated in this report. It is our opinion that field observations by the geotechnical engineer who has prepared this report are critical to the continuity of the project.

Slope Angles

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

DRAINAGE AND GRADIENT:

Adequate site drainage should be provided in the foundation area both during and after construction to prevent the ponding of water and the saturation of the subsurface soils. We recommend that the ground surface around the structure be graded so that surface water will be carried quickly away from the building. The minimum gradient within 10 feet of the building will depend on surface landscaping. We recommend that paved areas maintain a minimum gradient of 2%, and that landscaped areas maintain a minimum gradient of 8%. It is further recommended that roof drain downspouts be carried across all backfilled areas and discharged at least 10 feet away from the structure. Proper discharge of roof drain downspouts may require the use of subsurface piping in some areas. Planters, if any, should be so constructed that moisture is not allowed to seep into foundation areas or beneath slabs or pavements.

If adequate surface drainage cannot be maintained, or if subsurface seepage is encountered during excavation for foundation construction, a full perimeter drain is recommended for this building. It is recommended that this drain consist of a perforated drain pipe and a gravel collector, the whole being fully wrapped in a geotextile filter fabric. We recommend that this drain be constructed with a gravity outlet. If sufficient grade does not exist on the site for a gravity outlet, then a sealed sump and pump is recommended. Under no circumstances should a dry well be used on this site.

If half basement type structures or

loading dock areas are anticipated, the high water level found on this site should be controlled to prevent large upward fluctuations of this water surface. For this purpose, we recommend that this be accomplished by construction of an area drain beneath the building area. To control water surface movement, it is recommended that the drain outfall in a free gravity drain. If a gravity outfall is not possible, a sealed sump and pump is recommended to remove the water.

The existing drainage on the site must either be maintained carefully or improved. We recommend that water be drained away from structures as rapidly as possible and not be allowed to stand or pond near the building. We recommend that water removed from one building not be directed onto the backfill areas of adjacent buildings. We recommend that a hydrologist or drainage engineer experienced in this area be retained to complete a drainage plan for this site.

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

Should an automatic lawn irrigation system be used on this site, we recommend that the sprinkler heads be installed no less than 5 feet from the building. In

addition, these heads should be adjusted so that spray from the system does not fall onto the walls of the building and that such water does not excessively wet the backfill soils.

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

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

SHALLOW FOUNDATION, LIGHTWEIGHT STRUCTURES

Assuming that some amount of differential movement can be tolerated, then a conventional shallow foundation system, underlain by structural fill, placed in accordance with the recommendations contained within this report may be utilized. The foundation would consist of continuous spread footings beneath all bearing walls and isolated spread footings beneath all columns and other points of concentrated load. Such a shallow foundation system, resting on the properly constructed structural fill, may be designed on the basis of an allowable bearing capacity of 1800 psf maximum.

Recommendations pertaining to balancing, reinforcing, drainage, and inspection are considered extremely important and must be followed. Contact stresses beneath all continuous walls should be balanced to within + or - 200 psf at all points. Isolated interior column footings should be designed for contact stresses of about 150 psf less than the average used to balance the continuous walls. The criteria for balancing will depend somewhat on the nature of the structure. Single-story, slab-on-grade structures may be balanced on the basis of dead load only. Multi story structures may be balanced on the basis of dead load plus one half live load, for up to three stories.

If the design of the upper structure is such that loads can be balanced reasonably well, a floating structural slab type of foundation could be used on this site. Such a slab would require heavy reinforcing to resist differential bending along the rim wall. It is possible to design such a

slab either as a thickened edge only, a solid or a ribbed slab. A rim wall must be used for confinement purposes. Any such slab must be specifically designed for the anticipated loading.

Such a foundation system may settle to some degree, however, the use of a structural fill beneath the slab and rim wall will help reduce settlement and hold differential movement to a minimum. Relatively large slabs will tend to experience minor cracking and heave of lightly loaded interior portions, unless the slabs are specifically designed with this movement in mind.

Soil Replacement/Structural Fill

The existing low density, compressible soils should be removed to a depth of 2 feet below the proposed bottom footing or rimwall elevation. Once it is felt that adequate soil removal has been achieved, it is recommended that the excavation be closely examined by a representative of Lincoln DeVore to ensure that an adequate overexcavation depth has indeed occurred and that the exposed soils are suitable to support the proposed structural man-made fill.

Once this examination has been completed, it is recommended that a coarse-grained, non-expansive, non-free draining man-made structural fill be imported to this site. This imported fill should be placed in the overexcavated portion of this site in lifts not to exceed 6 inches after compaction. A

minimum of 90% of the soils maximum Modified Proctor dry density (ASTM D-1557) must be maintained during the soil placement. These soils should be placed at a moisture content conductive to the required compaction (usually Proctor optimum moisture content ± 2%). The granular material must be brought to the required density by mechanical means. No soaking, jetting, or puddling techniques of any type should be used in placement of fill on this site. To ensure adequate lateral support, we must recommend that the zone of overexcavation extend at least 2 feet around the perimeter of the proposed footing. To confirm the quality of the compacted fill product, it is recommended that surface density tests be taken at a maximum 2 foot vertical intervals.

The placement of a geotextile fabric for separation between the native soils and the structural fill may be recommended to aid the fill placement and to improve the stability of the completed fill.

When the structural fill is completed, an allowable bearing capacity of 1600 psf maximum may be assumed for proportioning the footings or loadbearing portions of the slab.

The placement of the structural fill a minimum of 2 feet beyond the edge of the structural slab should provide additional support for the eccentrically placed wall loads on the slab edges.

In some instances, improvement of the

subgrade beneath structures must be accomplished with a minimum of excavation. The following recommendations for subgrade improvement may be utilized when unstable (pumping) conditions are encountered.

Subgrade Improvement/Structural Fill

We recommend the following Structural Fill Sections for areas of moderately unstable subgrade (pumping), due to permanent or seasonally high Water table. Subgrade soils are assumed to be either fine grained sand (SM), Silt (ML), or Silty Clay (ML-CL). These sections assume the Subgrade Soils have an R Value >14.

The specific areas which will require placement of either the Biaxial Geogrid or the Geotextile Fabric will depend on the actual conditions encountered during construction. The subgrade section construction should be monitored by representatives of the Geotechnical Engineer.

For use Beneath Structures, Walks and Non Traffic Areas

Base of Foundations and Slabs
16" Imported Structural Fill (Hveem-Carmany R>70)
Biaxial Geogrid
4" Imported Structural Fill (Hveem-Carmany R>70)
Geotextile for separation and reinforcement

All Geosynthetics to extend a minimum of 4' beyond the limits of the slabs, pads and footings, unless shown otherwise on plans.

Geotextile Fabric for separation and

minor reinforcement may be either woven with a minimum Grab Strength of 180 lb., in the weakest direction (such as Mirafi 500-X) or non-woven/needle punched with a minimum Grab Strength of 110 lbs., in the weakest direction (such as Mirafi 140-N).

Biaxial Geogrid for reinforcement shall have a minimum Tensile Strength @ 5% Strain of 550 lb/ft., in the weakest direction (such as Tensar BX 1100).

The Imported Structural Fill (Hveem-Carmany R>70,swell not critical) is to be Granular, Medium to Coarse Grained, very low plastic (PI<4), Non Freedraining, Compactable and within the following Gradation:

Maximum size, by screening	6"
Passing the #4 screen	20% - 85%
Passing the #40 screen	10% - 60%
Passing the #200 screen	3% - 15%

Imported Structural Fill and Aggregate Base Course (ABC) to be compacted to 90% of its maximum Modified Proctor dry density (ASTM-D-1557) at a moisture content within ± 2% of optimum moisture. The use of light weight, tracked equipment will minimize subgrade degradation, vibratory compaction equipment is not recommended.

The finish 2" to 6" of the Structural Fill may be minus 3/4" Aggregate Base Course (ABC) to aid in obtaining the finish grading and an acceptable construction surface.

SETTLEMENT:

Close estimates of total and differential settlement will not be provided in this report since Lincoln DeVore has not been given exact foundation loads. Upon completion of the structural plans, the predicted settlements can be supplied upon request.

FROST PROTECTION

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

Structural slab-on-grade (Monolithic) foundation systems typically have an effective soil cover of less than 12 inches. Under normal use, the building and foundation system radiates sufficient heat that frost heave from the underlying soils is not normally a problem. However, additional protection can be provided by applying an insulation board to the exterior of the foundation and extending this board to approximately 18 inches below the final ground surface grade. This board may be applied either prior to or after the concrete is cast and it is very important that all areas of soil backfill be compacted. Local building officials should be consulted for regulatory frost protection depths.

DEEP FOUNDATIONS, HEAVY WEIGHTED STRUCTURE:

Because of the high loads associated with the main retail commercial structure, we recommend the use of a deep foundation system consisting of driven piles, penetrating the bedrock. Due to the very soft, in some cases flowing subgrade soils and the very high water table, the use of drilled piers would require casing and would be fairly difficult.

DRIVEN PILES:

We recommend that driven piles bear in the competent materials of the underlying formation. We anticipate that pile driving refusal will be encountered within a few feet of penetration into the Mancos Shale Formation bedrock. Based on a static analysis, piles driven to refusal may be designed for an allowable tip bearing capacity of 70 to 100 tons psf. To determine the bearing area of the pile, the area including the space between the flanges may be included. For example, an HP-12 pile may be assumed to have an end area of approximately 1 square foot. A round, closed-end pipe pile bearing area would be the area of the pile end plate. Pile driving refusal should be determined by our representative in the field. Generally, pile driving refusal is taken as a maximum of 15 blows per inch.

If pile groups are used, the overall capacity of the pile group should be reduced in accordance with the appropriate efficiency formula (such as the Converse-Labarre method). If bearing capacities greater than those recommended above are necessary, we recommend that the pile bearing capacity

be determined on the basis of static load tests.

It is anticipated that steel piling (either 'H' sections or concrete filled pipe) will be utilized in this construction. The following recommendations will assume the use of these materials. If wood or concrete piling are anticipated, recommendations can be readily provided.

Driving hammers should be of such size and type to consistently deliver effective dynamic energy suitable to the piles and materials into which they are to be driven. Hammers should operate at manufacturer's recommended speeds and pressures. We recommend that a pile driving hammer be used which is rated at least 19,000 feet pounds. However, driving energy should not be so large that pile damage occurs.

Piles must be used in groups to provide for eccentricities in loading. The group capacity will be less than the summation of the individual pile capacities, depending upon the relative spacing of the piles. A conservative estimate of group capacity is two-thirds of the summation of the individual pile capacities.

We recommend that minimum spacing of the piles be twice the average pile diameter or 1.75 times the diagonal dimension of the pile cross-section, but no less than 24 inches. It is recommended that the tops of the piles extend a minimum of 4 inches into the pile cap. Based on the exploration borings no pile shorter than feet is recommended unless proper

pile capacity is verified by field inspection by the Geotechnical Engineer. Vertical piles should not vary more than 2% from the plumb position. We further recommend that eccentricity of reaction on a pile group with respect to the load resultant not exceed a dimension that would produce overloads of more than 10% in any one pile.

Since the underlying bedrock is moderately expansive, we recommend a minimum of permanent pressure be maintained on each pier. The minimum pressure should be designed based on a tip uplift pressure of 2500 psf. The area used to consider the uplift pressure should be width times the depth of the pile section used when considering H piles. Round pipe piles will require en end uplift pressure of 2500 psf and a side uplift of 600 psf for the portion of the side wall in contact with the expansive formation.

Based on our analyses, a standard 10-3/4inch diameter, 1/4 inch wall, pipe pile driven to refusal may be designed for an allowable capacity of 70 to 100 tons. On this site the capacity of the pile will govern allowable load. Pile driving refusal required to obtain the recommended capacity was taken as 7 blows per inch with a 20 foot kip hammer. Driving hammers should be of such size and type to consistently deliver effective energy suitable to the piles and materials into which they are driven. Final pile driving refusal should be determined by representatives of Lincoln DeVore in the field.

DRIVEN PILE OBSERVATION:

Continuous observation of the pile driving operations and a pile load test, if required, should be performed by Lincoln DeVore as a representative of the owner. A continuous log should be maintained on the number of blows per foot required to drive each pile. Driving should be completed without interruption (except for splicing) and without jetting or pre-drilling unless the geotechnical engineer has been contacted for further recommendations.

GRADE BEAMS:

A reinforced concrete grade beam is recommended to carry the exterior wall loads in conjunction with the deep foundation system. We recommend that this grade beam be designed to span from bearing point to bearing point however, the grade beam may rest upon the native soils during construction. It is anticipated the native soils may settle away from this grade beam so no long term support by the underlying soils should be anticipated. We recommend a void space be left between the bottom of the grade beam and the subgrade below due to the expansive nature of the subgrade soils.

LATERAL LOADS:

If lateral loads are minimal, then only straight-shaft piers or piles will be used. If the lateral loads become significant, we recommend that batter piles be used. To aid in the design of laterally loaded piles, we recommend that

the following values of lateral modulus of subgrade reaction be used.

Geologic Unit	Driven Piles
Structural Fill	250 kcf
Alluvium (Soils Types I & II)	120 kcf
Weathered Bedrock	600 kcf
Formational Bedrock	1,000 kcf

CONCRETE SLABS ON GRADE

Slabs could be placed directly on the natural soils or on a structural fill. Due to later slab problems associated with the very soft, compressible alluvial soils found on this site, it is recommended that a minimum of 12" of structural fill be placed beneath all concrete slabs on grade. We recommend that all slabs on grade be constructed to act independently of the other structural portions of the building. One method of allowing the slabs to float freely is to use expansion material at the slab- structure interface.

In general, we recommend that all on-grade slabs be isolated from other structural portions of the building. This is generally accomplished by an expansion joint at the slab-foundation wall interface. If a vapor barrier is desired beneath slabs, we recommend that it be overlain by at least 2 inches of sand to decrease the likelihood of curing problems. An alternate method of reducing finishing problems would be to place the vapor barrier beneath approximately 6 inches of a minus 3/4 inch gravel fill. This method must be very carefully accomplished to minimize excessive puncturing and tearing of the vapor barrier.

It is recommended that floor slabs on grade be constructed with control joints placed to divide the floor into sections not exceeding 360 to 400 square feet, maximum, assuming these slabs have not been specifically designed and reinforced for larger sections. Also, additional control joints are recommended at all inside corners and at all columns to

control cracking in these areas.

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

In addition to the previous recommendations, the following discussion for a ACI Class 5 concrete floor slab on grade may be applicable for this relatively high performance concrete slabs on grade.

Floor Slab, Warehouse, ACI Class 5

Design Criteria

ACI 302.1R-89 (Guide for Concrete Floor and Slab Construction) & ACI 360R-92 (Guide for Design of Slabs on Grade).

Design Method - Portland Cement Association (PCA), for thickness.

Design Modifications to Minimize Slab Shrinkage and Curling. Information provided to Lincoln-DeVore indicates the Slabs may classify as: ACI Class 5, Concrete Slabs (Heavy Commercial/Light Industrial traffic loading). In addition, the following criteria are assumed for design purposes:

Pneumatic Wheeled Traffic, No Steel or Hard Wheels
(Steel or Hard Wheels will require a hardened Finish or a 2-course slab)
Temperature Gradient - 30° Critical Length - 26 feet
Friction at slab base - F = 1.6 (assume Aggregate Base Course)
Concrete may be 6" thick, Single Course Slab

Subgrade Preparation

Assume a minimum of 12" granular structural fill beneath slab. To be evenly compacted to 90% maximum Modified Proctor, with Steel Wheel Final Finish for a smooth surface.

The granular subgrade should be slightly moist prior to placing concrete. Do not overwet, as subgrade saturation must not be allowed to occur.

DOWELS at CONSTRUCTION JOINTS

The recommended Dowel size and spacing (ACI 302.1R-89, Floor and Slab Construction) is:
3/4" diameter, 16" long Dowels placed at 12" on-center.

Assuming the Slab is constructed to minimize slab shrinkage and curling and is underlain by a Granular, Structural Fill, placed in accordance with the recommendations contained in this report, Load Transfer is partially accomplished by the Structural Fill. If these conditions are met, the Dowel size and spacing may be modified. One such dowel specification could be:

3/4" diameter, 16" long Dowels placed at 16" on-center.

The dowels should be smooth, with one end capped & lubricated. Dowels should not be attached to the Reinforcing Steel and should be placed square with the joint and level with the slab surface. If the dowels are misaligned, the dowel should be cut and realigned prior to placing the adjacent slab.

Floor Slab Reinforcing, ACI Class 5

To resist slab curling, it has been found beneficial to place the Reinforcing 2" below finished slab top. Minimum Slab Reinforcing may be determined using the Subgrade Drag Formula and is recommended to be equal to or greater than 0.15% of the area of the concrete.

For example, If Concrete is Placed in Long Strips:

Use #3@ @ 24" c/c for slab width or length up to 20'
#3@ @ 18" c/c for slab width or length up to 40'

OR

If Concrete is placed in large, Square Sections (Monolithic and slab edges up to 40' long).

Use #3θ @ 18" c/c or #4θ @ 30" c/c or 66-44 mats.

Slab reinforcing should be on Protected metal spacers, chairs, bolsters and ties, in accordance with CRSI "Manual of Standard Practice for Reinforced Concrete Construction.

All Reinforcing should be clean and free from mud, rust, scale & grease.

Concrete & Finishing

Minimum design 28 day strength 3500 psi (Maximum design 4000 psi)

Maximum slump 4" Entrained air to be between 3% to 5-1/2%

1-1/2" maximum aggregate Size
Recommend minimum amount or No water reducer.

No grate tampers (jitterbugs) or mesh rollers for slumps >1"
No retempering of the plastic concrete slab surface.
Steel trowel finish with at minimum of 2 steel trowelings.
Cure with wet coverings 4-5 days or use an approved moisture retention method.

For constructed slab flatness, recommend using a highway straight edge rather than a Bull Float to strike off the plastic concrete.

EARTH RETAINING STRUCTURES

The active soil pressure for the design of earth retaining structures, utilizing Soil Types I or II as backfill may be based on an equivalent fluid pressure of 48 pounds per cubic foot. The active pressure should be used for retaining structures which are free to move at the top (unrestrained walls). For earth retaining structures which are fixed at the top, such as basement walls, an equivalent fluid pressure of 60 pounds per cubic foot may be used. It should be noted that the above values should be modified to take into account any surcharge loads, sloping backfill or other externally applied forces. The above equivalent fluid pressures should also be modified for the effect of free water, if any.

The passive pressure for resistance to lateral movement may be considered to be 230 pcf per foot of depth. The coefficient of friction for concrete to soil may be assumed to be 0.26 for resistance to lateral movement. When combining frictional and passive resistance, the latter must be reduced by approximately 1/3.

Drainage behind retaining walls is considered critical. If the backfill behind the wall is not well drained, hydrostatic pressures are allowed to build up and lateral earth pressures will be considerably increased. Therefore, we recommend a vertical drain be installed behind any impermeable retaining walls. Because of the difficulty in placement of a gravel drain, we recommend the use of a composite drainage mat

similar to Exxon Battledrain or Tensar MD Series NS-1100. An outfall must be provided for this drain.

REACTIVE SOILS

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

PAVEMENTS

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

AASHTO Classification - A-4(8) Unified Classification - ML-CL

Soil Type I

R =	18
Expansion @ 300 psi =	0.3 psf
Displacement @ 300 psi =	5.41

Displacement values higher than 4.00 generally indicate the soil is unstable and may require confinement for proper performance.

No estimates of traffic volumes have been provided to Lincoln DeVore, therefore we have assumed several traffic loads based on similar type projects in the Grand Junction area. However, we assume that the roads will be classified as commercial. The design procedures utilized are those recognized by the Colorado Department of Highways and the 1986 AASHTO design procedure.

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

PROPOSED PAVEMENT SECTIONS

Based on the soil support characteristics outlined above, the following pavement sections are recommended. It should be noted that if the soils are not pumping, the amounts or types of Geotextiles or Biaxial Geogrids may be reduced or eliminated entirely. It must also be noted that while the R Value for the soils is relatively high, the underlying subgrade soils are quite soft and may be fairly difficult to obtain proper compaction and truly realize the R Value of 18.

PAVEMENT SECTIONS, with GEOSYNTHETIC LAYERS

We recommend the following Pavement Sections for areas of moderately unstable subgrade (pumping), due to permanent or seasonally high Water table. Subgrade soils are assumed to be either fine grained sand (SM), Silt (ML), or Silty Clay (ML-CL). These sections assume the Subgrade Soils have an R Value >14.

The specific areas which will require placement of either the Biaxial Geogrid or the Geotextile Fabric will depend on the actual conditions encountered during construction. The subgrade and road section construction should be monitored by representatives of the Geotechnical Engineer.

PARKING AREAS (Car/occ. Truck) [18k EAL/day = 8]

	3"	Asphaltic Concrete Pavement
on	8"	Aggregate Base Course (ABC)
on		Biaxial Geogrid or Geotextile for reinforcement
on	6"	Imported Structural Fill (Hveem-Carmany R>70)
on		Geotextile for separation and reinforcement

17"

TRAFFIC AREAS (Cars & Trucks) [18K EAL/day = 26]

	3"	Asphaltic Concrete Pavement
on	6"	Aggregate Base Course (ABC)
on		Geotextile for minor reinforcement
25" on	10"	Imported Structural Fill (Hveem-Carmany R>70)
on		Biaxial Geogrid or Geotextile for reinforcement
on	6"	Imported Structural Fill (Hveem-Carmany R>70)
		Geotextile for separation and reinforcement

HEAVY TRAFFIC AREAS (Entry Areas & Trucks) [18K EAL/day = 46]

	3"	Asphaltic Concrete Pavement
on	6"	Aggregate Base Course (ABC)
on		Geotextile for minor reinforcement
★ 27" on	12"	Imported Structural Fill (Hveem-Carmany R>70)
on		Biaxial Geogrid or Geotextile for reinforcement
on	6"	Imported Structural Fill (Hveem-Carmany R>70)
		Geotextile for separation and reinforcement

CONCRETE Traffic Drives/occ. Trucks [18K EAL/day = 26]

	6"	Concrete Slab
on	4"	Aggregate Base Course (ABC)
~~24"~~ on		Biaxial Geogrid or Geotextile for reinforcement
on	6"	Imported Structural Fill (Hveem-Carmany R>70)
on		Geotextile for separation and reinforcement

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

SUBGRADE IMPROVEMENT, MECHANICALLY STABILIZED FILL

The additional materials and effort expended in subgrade stabilization is to provide a construction platform, so the actual Road Section can be placed and compacted. The specific areas which will require placement of either the Biaxial Geogrid or the Geotextile Fabric will depend on the actual conditions encountered during construction. The subgrade and road section construction should be monitored by representatives of the Geotechnical Engineer.

Geotextile Fabric for separation and minor reinforcement may be either woven with a minimum Grab Strength of 180 lb., in the

weakest direction (such as Marafi 500-X) or non-woven/needle punched with a minimum Grab Strength of 110 lbs., in the weakest direction (such as Marafi 140-N).

Biaxial Geogrid for reinforcement shall have a minimum Tensile strength @ 5% Strain of 550 lb/ft., in the weakest direction (such as Tensar BX 1100).

The Imported structural Fill (Hveem-Carmany R<70 , swell not critical) is to be Granular, Medium to Coarse Grained, Very low plastic (PI<4), Non Freedraining, Compactable and within the following Gradation:

Maximum size, by screening	6"
Passing the #4 screen	20% - 85%
Passing the #40 screen	10% - 60%
Passing the #200 screen	3% - 15%

Imported Structural Fill and Aggregate Base Course (ABC) to be compacted to 90% of its maximum Modified Proctor dry density (ASTM-D-1557) at a moisture content within ± 2% of optimum moisture. The use of light weight tracked equipment will minimize subgrade degradation, vibratory compaction equipment is not recommended.

During the placement of any structural fill, it is recommended that a sufficient amount of field tests and observation be performed under the direction of the Geotechnical Engineer. The Geotechnical Engineer should determine the amount of observation time and field density tests required to determine substantial conformance with these recommendations.

Any areas of Fill or Subgrade instability encountered during construction are to be immediately brought to the attention of the Geotechnical Engineer, so recommendations for stabilization can be given.

The Subgrade Stabilization is normally considered effective if the imported structural fill materials are confined, if specified imported fill and specified asphalt densities are obtained and the final traffic surface is stable according to local practices. Some 'pumping and rolling' of the finish Base Course (ABC) surface is anticipated but, rutting should not occur.

PAVEMENT SECTION CONSTRUCTION

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

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

Concrete Pavement

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

lizing compressive strength criteria.

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

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

The concrete should be placed at the lowest slump practical for the method of placement. In all circumstances, the maximum slump should be limited to 4 inches. Proper consolidation of the plastic concrete is important. The placed concrete must be properly protected and cured.

LIMITATIONS

This report is issued with the understanding that it is the responsibility of the owner, or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project, and are incorporated into the plans. In addition, it is his responsibility that the necessary steps are taken to see that the contractor and his sub-contractors carry out these recommendations during construction. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in acceptable or appropriate standards may occur or may result from legislation or the broadening of engineering knowledge. Accordingly, the findings of this report may be invalid, wholly or partially, by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of 3 years.

The recommendations of this report pertain only to the site investigated and are based on the assumption that the soil conditions do not deviate from those described in this report. If any variations or undesirable conditions are encountered during construction or the proposed construction will differ from that planned on the day of this report, Lincoln DeVore should be notified so that supplemental

recommendations can be provided, if appropriate.

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

PATTERSON (F) ROAD

745' +/-

29 ROAD

610 +/-

TB #1 — 100' / 190'

TB #2 — 100' / 420'

TB #3 — 215' / 100'

TB #4 — 255' / 300'

TB #5 — 375' / 100'

TB #6 — 360' / 285'

TB #7 — 360' / 520'

TB #8 — 375' / 655'

TB #9 — 585' / 100'

TB #10 — 520' / 285'

TB #11 — 550' / 400'

TB #12 — 520' / 520'

EXPLORATION BORING

BORING LOCATION DIAGRAM

PROPOSED SAFEWAY
29 & PATTERSON ROADS
GRAND JUNCTION, COLORADO

LINCOLN DeVORE
ENGINEERS · GEOLOGISTS

1441 MOTOR STREET
GRAND JCT., COLORADO
COLO. SPRINGS–PUEBLO

DRAWN BY: E.M. MORRIS	LD #: 84768–J	SHEET: 1 OF	
CHECKED BY:	SCALE: PLAN – 1"= 30'	DATE: 2–2–96	
	FILE #: 84768	REV.	

SOILS DESCRIPTIONS:

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

ROCK DESCRIPTIONS:

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

SYMBOLS & NOTES:

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

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

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

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

LINCOLN DeVORE INC.

COLORADO SPRINGS
PUEBLO – GRAND JUNCTION

EXPLANATION OF BOREHOLE LOGS AND LOCATION DIAGRAMS

BORING NO. 1

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION			BLOW COUNT	SOIL DENSITY pcf	WATER %
		occ. 'PIPING' FEATURES IN SOILS					
		DEBRIS FAN DEPOSITS					
		ML-CL SANDY, VERY SILTY CLAY	SI. MOIST	ST		96.3	8.2%
5		I COMPRESSIBLE		5			
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS					
		LOW DENSITY	WET				
		FREE WATER ▽					
		ML-CL SILTY CLAY		SPT	1/6		25.6%
10		II DECREASING GRAVELS		10	2/12		
					4/18		
15				15			
20		TD @ 10'		20			
25				25			
30				30			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 7-1/2'

During Drilling 1-23-96

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. 84768-J

Drawn EMM

BORING NO. 2

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		occ. 'PIPING' FEATURES IN SOILS				
		DEBRIS FAN DEPOSITS SULFATES				
		ML-CL SANDY, VERY SILTY CLAY SI. MOIST	ST		97.9	9.4%
5		I COMPRESSIBLE BROWN	5	5/6		
		STRATA of SANDY SILT	SPT	11/12		10.7%
		LOW DENSITY		14/18		
		GRAY-BROWN WET				
		ML-CL SILTY CLAY	ST		94.1	27.2%
10		FREE WATER STRATIFIED	10	1/6		27.9%
		II	SPT	3/12		
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS		4/18		
		ML-CL SILTY CLAY DECREASING GRAVELS	CS	1/6	89.4	32.5%
15		II COMPRESSIBLE	15	3/6 5/6		
		HOLE IS SQUEEZING SHUT				
20			20			
		TD @ 15'				
25			25			
30			30			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 9'

During Drilling 1-16-96

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. 84768-J

Drawn EMM

BORING NO. 3

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		VERY HIGH SOLUABLE SULFATE SALTS				
		DEBRIS FAN DEPOSITS — SI. MOIST				
	ML-CL	SANDY, VERY SILTY CLAY	ST		95.9	8.6%
5	I	LOW DENSITY BROWN SULFATES	5	5/6		10.5%
		COMPRESSIBLE STRATIFIED	SPT	10/12		
				16/18		
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS				
	ML-CL	SILTY CLAY LOW DENSITY WET	ST		101.1	28.1%
10	II	GRAY-BROWN STRATIFIED	10	1/6		
		FREE WATER ▽	SPT	3/12		25.6%
				5/18		
	ML-CL	SILTY CLAY Occ SILT STRATA	CS	2/6	99.9	27.8%
15	II	COMPRESSIBLE	15	4/12		
				7/18		
		VERY EASY TO DRILL				
		HOLE IS SQUEEZING SHUT				
		SATURATED				
20			20			
	MANCOS SHALE	SULFATES				
	CL	SILTY CLAY MEDIUM PLASTICITY MOIST				
	III	EXPANSIVE DENSER w/DEPTH	SPT	25/6		13.9%
				75/12		
25			25			
		TD @ 24'				
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		Free Water @ 11'				
		During Drilling 1-16-96				

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**

BORING NO. 4

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		SURFACE REWORKED by AGRICULTURE				
		SULFATES occ. 'PIPING' FEATURES IN SOILS				
		BROWN				
		ML-CL SANDY, VERY SILTY CLAY	SI. MOIST	SPT 5/6		11.5%
5		I COMPRESSIBLE DEBRIS FAN DEPOSITS	5	9/12		
		ML-CL STRATA of SANDY SILT		14/18		
		II SULFATES	LOW DENSITY			
		I GRAY-BROWN	MOIST			
		ML-CL SILTY CLAY VERY STRATIFIED	ST		93.5	14.7%
10		FREE WATER SANDY SILT, SANDY SILTY CLAY	10	2/6		
		II GRAVELS OF SILTSTONE FRAGMENTS	SPT	4/12		22.1%
				7/18		
15			15			
		TD @ 11'				
20			20			
25			25			
30			30			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 9'

During Drilling 1-23-96

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. 84768-J

Drawn EMM

BORING NO. 5

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION				BLOW COUNT	SOIL DENSITY pcf	WATER %
		Occ. 'PIPING' FEATURES						
	ML-CL	HIGH SOLUABLE SULFATE SALTS						
	II	DEBRIS FAN DEPOSITS			SI. MOIST			
	ML-CL	SANDY, SILTY CLAY		STRATIFIED	ST		95.7	9.4%
5	I	LOW DENSITY	BROWN	WET	5			
		COMPRESSIBLE		SULFATES				
	FREE WATER ▽	DECREASING DENSITY						
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS						
	ML-CL	SILTY CLAY	LOW DENSITY		ST		86.7	24.6%
10	II	GRAY-BROWN		STRATIFIED	10			
	ML-CL	SANDY, VERY SILTY CLAY						
	I		VERY LOW DENSITY					
	ML-CL	SILTY CLAY	Occ SILT STRATA					
15	II	COMPRESSIBLE			15			
		VERY EASY TO DRILL						
			HOLE IS SQUEEZING SHUT					
		COMPRESSIBLE						
20					20			
	MANCOS SHALE		WEATHERED SURFACE					
	CL	SILTY CLAY	VERY HIGH SULFATES					
	III	EXPANSIVE	DENSER w/DEPTH		SPT	27/6		13.0%
			MEDIUM PLASTICITY	MOIST		72/12		
25					25	122/18		
		TD @ 24'						
30					30			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 6-1/2'

During Drilling 1-23-96

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**

BORING NO. 6

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		Occ. 'PIPING' FEATURES				
		ML-CL HIGH SOLUABLE SULFATE SALTS				
		II DEBRIS FAN DEPOSITS	SI. MOIST			
		ML-CL SANDY, SILTY CLAY	STRATIFIED	SPT 6/6		9.2%
5		I LOW DENSITY GRAVELLY	5	13/12		
		COMPRESSIBLE	SULFATES	26/18		
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS				
		FREE WATER ▽	DECREASING DENSITY WET			
		ML-CL SILTY CLAY	LOW DENSITY	SPT 1/6		24.1%
10		II GRAY-BROWN	STRATIFIED 10	2/12		
				3/18		
		ML-CL SANDY, VERY SILTY CLAY				
		I	VERY LOW DENSITY			
		ML-CL SILTY CLAY	Occ SILT STRATA			
15		II COMPRESSIBLE	15			
		VERY EASY TO DRILL				
		ML-CL SILTY CLAY	ST		90.4	23.8%
20		II	DEBRIS FAN DEPOSITS 20			
		ML-CL SANDY, SILTY CLAY	LOW DENSITY			
		I				
		COMPRESSIBLE				
25		ML-CL SILTY CLAY	HOLE IS SQUEEZING SHUT 25			
		II	Occ. SANDY SILT STRATA			
		VERY LOW DENSITY				
		MANCOS SHALE	EXPANSIVE	SPT 27/6		14.6%
30		CL SILTY CLAY	VERY HIGH SULFATES 30	77/12		
		III MOIST	Blow Counts are cumulative for each	127/18		
			6 inches of sampler penetration.			
		TD @ 30'	Free Water @ 8'			
			During Drilling 1-23-96			

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**

BORING NO. 7

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		ML-CL VERY HIGH SOLUABLE SULFATE SALTS				
		I SANDY, VERY SILTY CLAY	SL. MOIST			
		ML-CL SILTY CLAY COMPRESSIBLE	BROWN ST		89.4	14.6%
5		II LOW DENSITY VERY SOFT	5	1/6		18.9%
		FREE WATER Y SULFATES STRATIFIED	SPT	3/12		
				4/18		
		ML-CL COMPRESSIBLE				
		I GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS				
		ML-CL SILTY CLAY LOW DENSITY	WET ST		90.9	24.9%
10		II GRAY-BROWN STRATIFIED	10	1/6		29.8%
			SPT	2/12		
				4/18		
		ML-CL SILTY CLAY Occ SILT STRATA	CS	2/6	88	29.9%
15		II COMPRESSIBLE	15	4/12		
				6/19		
		VERY EASY TO DRILL				
			SATURATED			
20		HOLE IS SQUEEZING SHUT	20			
		ML-CL SANDY, VERY SILTY CLAY				
		I LOW DENSITY				
		COMPRESSIBLE				
25		HOLE SQUEEZED SHUT	25			
		MANCOS SHALE HIGH SULFATES				
		CL SILTY CLAY MEDIUM PLASTICITY	MOIST			
		III EXPANSIVE				
30		TD @ 28'	30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		Free Water @ 6'				
		During Drilling 1-16-96				

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

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

Job No. 84768-J

Drawn EMM

BORING NO. 8

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		ML-CL SANDY, VERY SILTY CLAY VERY MOIST	SPT	2/6		18.4%
		I LOW DENSITY		6/12		
		WET	ST	9/18	87.8	25.1%
		FREE WATER	10			
		VERY STRATIFIED				
		SANDY SILT, SILTY CLAY & CLAYEY SILT				
		ML-CL SANDY, VERY SILTY CLAY				
		I LOW DENSITY GRAVELS VERY SANDY				
20		ML-CL SILTY CLAY VERY SOFT	20			
		II COMPRESSIBLE				
		VERY EASY TO DRILL				
		VERY SOFT				
30		BROWN SANDY SILT STRATA	30			
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS				
		ML-CL SANDY, VERY S COMPRESSIBLE				
		I HOLE IS SQUEEZING SHUT				
		VERY SOFT TO DRILL				
40			40			
			SPT	51/6		
		MANCOS SHALE VERY HIGH SULFATES		133/12		14.5%
		CL SILTY CLAY MEDIUM PLASTICITY MOIST				
		III EXPANSIVE				
50			50			
		NOTE SCALE CHANGE OF DRILL LOG				
60			60			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 8'

During Drilling 1-29-96

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. 84768-J

Drawn EMM

BORING NO. 9

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		Occ. 'PIPING' FEATURES				
	ML-CL	SANDY, SILTY CLAY	DEBRIS FAN DEPOSITS			
	I	SILTY CLAY	SI. MOIST			
	ML-CL	SANDY, SILTY CLAY	STRATIFIED	ST	96.4	22.5%
5	II	LOW DENSITY BROWN	WET	5		
		COMPRESSIBLE	SULFATES			
	FREE WATER ▽		GRAVELS OF SILTSTONE FRAGMENTS			
	ML-CL	SANDY, SILTY CLAY	SOFT TO DRILL			
	I		LOW DENSITY	ST	93.1	24.9%
10	II	SANDY, SILTY CLAY	GRAY-BROWN	10		
		TD @ 9'				
15				15		
20				20		
25				25		
30				30		

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 6-1/2'

During Drilling 1-25-96

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

Job No. 84768-J

Drawn EMM

BORING NO. 10

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION			BLOW COUNT	SOIL DENSITY pcf	WATER %
		Occ. 'PIPING' FEATURES	SILTY CLAY SOIL				
		SANDY, CLAY STRATA	SULFATE SALTS				
		DEBRIS FAN DEPOSITS	FIRM SL. MOIST				
		ML-CL SANDY, SILTY CLAY	STRATIFIED	ST		109.2	15.1%
5		I DECREASING DENSITY	GRAVELLY	WET 5	1/6		
		COMPRESSIBLE	SULFATES	SPT	3/12		25.4%
		FREE WATER ▽			5/18		
		LOW DENSITY					
		ML-CL SILTY CLAY		ST		96.3	24.7%
10		II GRAY-BROWN	STRATIFIED	10	1/12		
				SPT	2/18		23.3%
		ML-CL SANDY, VERY SILTY CLAY					
		I SLIGHTLY FIRMER					
		ML-CL SILTY CLAY Occ SILT STRATA		CS	4/6	99.5	23.5%
15		II INCREASING SAND		15	7/12		
					11/18		
		DEBRIS FAN DEPOSITS					
		DECREASING DENSITY					
		ML-CL SANDY, SILTY CLAY					
20		I COMPRESSIBLE		20			
		VERY EASY TO DRILL	VERY LOW DENSITY				
		ML-CL SILTY CLAY HOLE IS SQUEEZING SHUT					
		II COMPRESSIBLE					
30		ML-CL GRAVELLY, SANDY, SILTY CLAY		30			
		I COMPRESSIBLE					
		VERY LOW DENSITY					
		VERY GRAVELLY					
		MANCOS SHALE EXPANSIVE					
35		CL SILTY CLAY	VERY HIGH SULFATES	35	25/6		16.0%
		III MOIST	Blow Counts are cumulative for each	SPT	75/12		
			6 inches of sampler penetration.				
		TD @ 37'	Free Water @ 7'				
			During Drilling 1-16-96				

LOG OF SUBSURFACE EXPLORATION

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

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

Job No. 84768-J

Drawn EMM

BORING NO. 11

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION			BLOW COUNT	SOIL DENSITY pcf	WATER %
		ML-CL SILTY CLAY	VERY MOIST	ST		102.3	17.1%
		II COMPRESSIBLE					
		FREE WATER ▽		ST		94.9	25.1%
10		ML-CL SILTY CLAY	GRAVELLY	10			
		II COMPRESSIBLE	VERY STRATIFIED				
		ML-CL SANDY, VERY SILTY CLAY					
		I LOW DENSITY					
			SANDY SILT & CLAYEY SILT				
20		ML-CL SILTY CLAY		20			
		II COMPRESSIBLE					
		VERY EASY TO DRILL					
			HOLE IS SQUEEZING				
30		BROWN	SANDY SILT STRATA	30			
		GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS					
			COMPRESSIBLE				
		VERY SOFT TO DRILL					
40		MANCOS SHALE	HIGH SULFATES	SPT 40	18/6		17.2%
		CL SILTY CLAY	EXPANSIVE	MOIST	50/12		
		III MEDIUM PLASTICITY			93/18		
50		TD @ 41'		50			
		NOTE SCALE CHANGE OF DRILL LOG					
60				60			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 7'

During Drilling 1-25-96

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. 84768-J

Drawn EMM

BORING NO. 12

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT	SOIL DENSITY pcf	WATER %
		ML-CL SANDY, VERY SILTY CLAY	MOIST	SPT 3/6		12.7%
		I GRAVELS OF SILTSTONE & SANDSTONE FRAGMENTS		5/12		
		FREE WATER VERY STRATIFIED		7/18		
10		ML-CL SILTY CLAY	LOW DENSITY	10		
		II COMPRESSIBLE				
		VERY SOFT TO DRILL		ST	91.1	28.6%
		ML-CL SANDY, VERY SILTY CLAY				
		I LOW DENSITY				
20		ML-CL SILTY CLAY		20		
		II COMPRESSIBLE				
		BROWN SANDY SILT STRATA				
		VERY EASY TO DRILL				
		VERY STRATIFIED				
30		Occ. SANDY SILT		30		
		HOLE IS SQUEEZING SHUT				
		COMPRESSIBLE				
		ML-CL SILTY CLAY				
		II VERY SOFT TO DRILL				
40				40		
		COMPRESSIBLE				
		MANCOS SHALE VERY HIGH SULFATES		SPT 52/6		14.8%
		CL SILTY CLAY MEDIUM PLASTICITY	MOIST	167/12		
		III EXPANSIVE				
50				50		
		NOTE SCALE CHANGE OF DRILL LOG				
		TD @ 45'				
60				60		

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 6'

During Drilling 1-25-96

LOG OF SUBSURFACE EXPLORATION

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. 84768-J

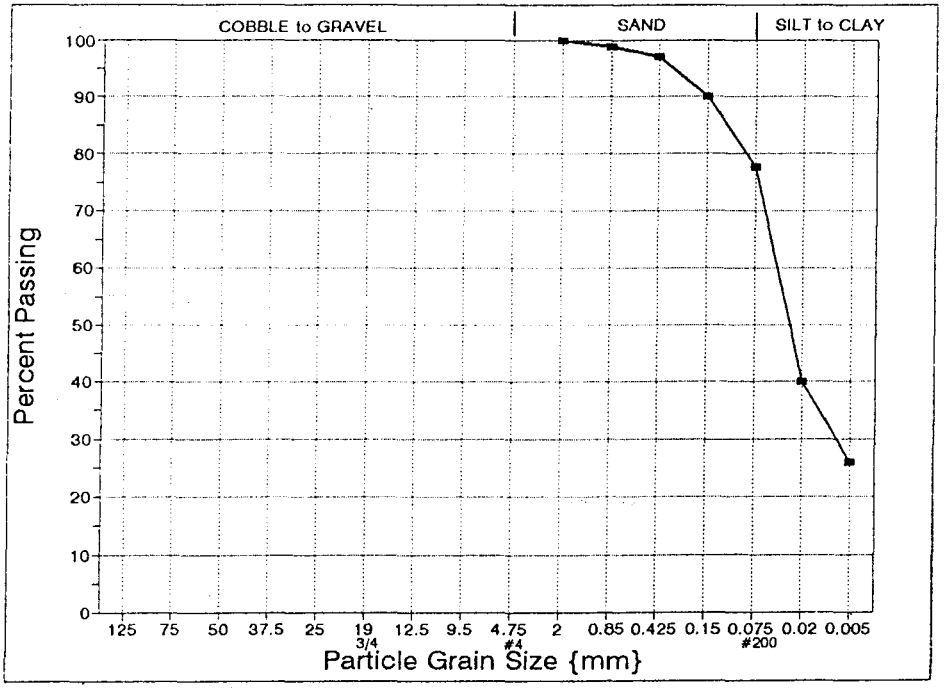
Drawn EMM

Soil Sample: **SANDY, VERY SILTY CLAY (ML-CL)** Sample No. **I (Typical)** 1

Job Location **SAFEWAY - 29 & Patterson Road, G.J.** Test by: **LRS**

Natural Water Content (w): **9.4%** Boring No.: **2** Depth: **3'**

Soil Specific Gravity (Gs): **2.66** In-Place Density (pcf): **97.9**



Effective size mm

Cu

Cc

Plastic Limit (PL) 20 %

Liquid Limit (LL) 25 %

Plasticity Index (PI) 5 %

Shrinkage Limit (SL) %

Shrinkage Ratio %

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	
3/4"	19	
1/2"	12.5	
3/8"	9.5	
# 4	4.75	
#10	2	100
#20	0.85	99
#40	0.425	97
#100	0.15	90
#200	0.075	77.8
	0.02	40
	0.005	26

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture : %

HVEEM-CARMANY: **FHA Soil Swell:**

'R' Value @ 300 psi: 18 % Swell

Displacement 300 psi: 5.41 psf

Expansion @ 300 psi: 0.3

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 950 psf

Unconfined Compression (qu): psf

CONSOLIDATION: 2.57 % 2042 psf

3.53 % 4069 psf

SULFATE SALTS: 1500 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

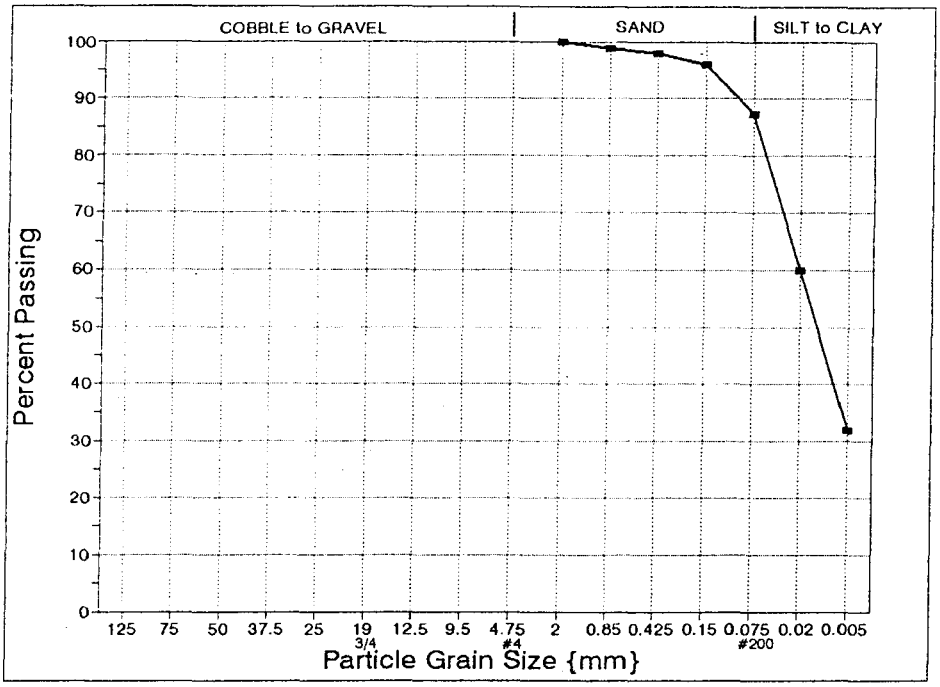
Drawn **EMM**

Soil Sample: **SANDY, VERY SILTY CLAY (ML-CL)** Sample No. **II (Typical)** 2

Job Location **SAFEWAY - 29 & Patterson Road, G.J.** Test by: **LRS**

Natural Water Content (w): **24.9%** Boring No.: **7** Depth: **8'**

Soil Specific Gravity (Gs): **2.66** In-Place Density (pcf): **90.9**



Effective size mm

Cu

Cc

Plastic Limit (PL) 20 %

Liquid Limit (LL) 27 %

Plasticity Index (PI) 7 %

Shrinkage Limit (SL) %

Shrinkage Ratio %

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	
3/4"	19	
1/2"	12.5	
3/8"	9.5	
# 4	4.75	
#10	2	100
#20	0.85	99
#40	0.425	98
#100	0.15	96
#200	0.075	87.4
	0.02	60
	0.005	32

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture : %

HVEEM-CARMANY:

'R' Value @ 300 psi:

Displacement 300 psi:

Expansion @ 300 psi:

FHA Soil Swell:

% Swell

psf

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 950 psf

Unconfined Compression (qu): psf

CONSOLIDATION: 2.91 % 2056 psf

5.12 % 4116 psf

SULFATE SALTS: 1250 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

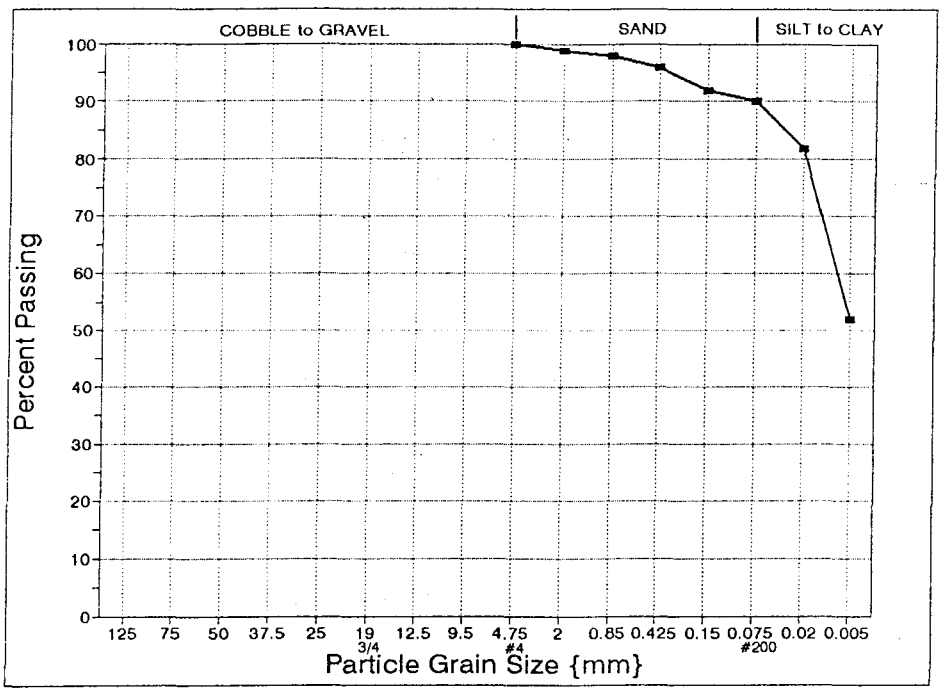
Drawn **EMM**

Soil Sample: **MANCOS SHALE Frm. SILTY CLAY (CL)** Sample No. **III (Typical)** 3

Job Location **SAFEWAY - 29 & Patterson Road, G.J.** Test by: **LRS**

Natural Water Content (w): **13.9%** Boring No.: **3** Depth: **22'**

Soil Specific Gravity (Gs): **2.66** In-Place Density (pcf):



Effective size mm

Cu

Cc

Plastic Limit (PL)	31	%
Liquid Limit (LL)	43	%
Plasticity Index (PI)	12	%
Shrinkage Limit (SL)		%
Shrinkage Ratio		%

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	
3/4"	19	
1/2"	12.5	
3/8"	9.5	
# 4	4.75	100
#10	2	99
#20	0.85	98
#40	0.425	96
#100	0.15	92
#200	0.075	90.2
	0.02	82
	0.005	52

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture : %

HVEEM-CARMANY: **FHA Soil Swell:**

'R' Value @ 300 psi: % Swell

Displacement 300 psi: psf

Expansion @ 300 psi:

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 7000 psf

Unconfined Compression (qu): psf

CONSOLIDATION: % psf

% psf

SULFATE SALTS: 2000 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
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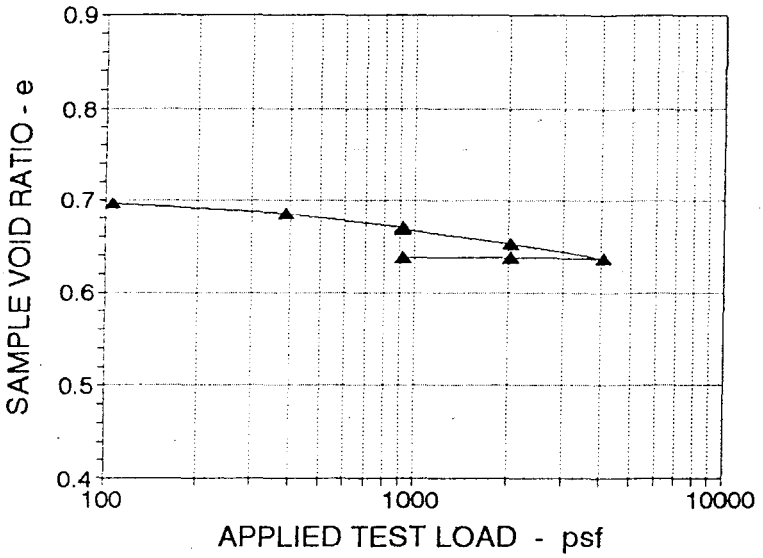
SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**



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

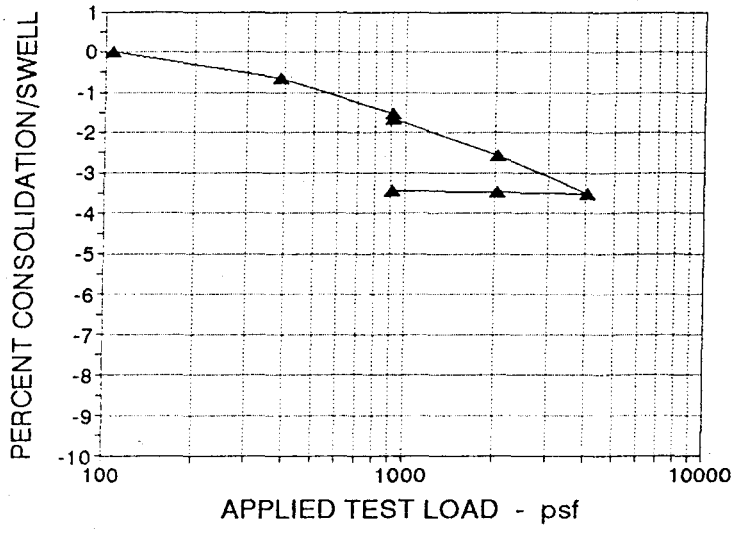
The 'Seating' Load Is To Remove Slack From The Apparatus And To Provide An Accurate Point of Beginning.

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

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

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

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



LOAD SUMMARY

106	*psf SEATING LOAD*
921	*psf SAMPLE SATURATED*
0.014	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.07	*% SAMPLE REBOUND @ UNLOAD*
3.53	*% MAXIMUM CONSOLIDATION*
4069	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	97.9	101.4	101.4
SOIL MOISTURE (%)	20.5%	23.9%	23.9%
CONSOLIDATION (%)	-0-	3.53%	3.46%
VOID RATIO (e)	0.696	0.636	0.637
SATURATION (%)	78%	100%	100%

SOIL #:	I
SOIL TYPE:	ML-CL
TEST HOLE #:	2 @ 3'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

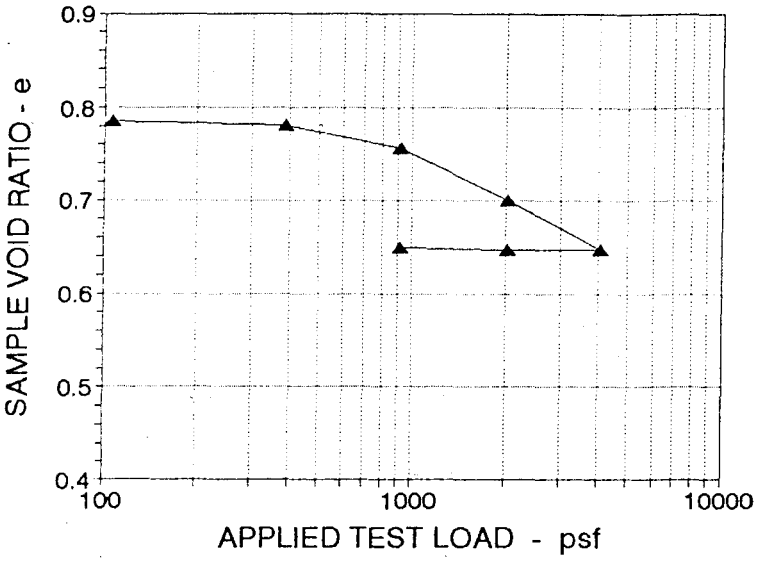
SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**

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



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

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

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

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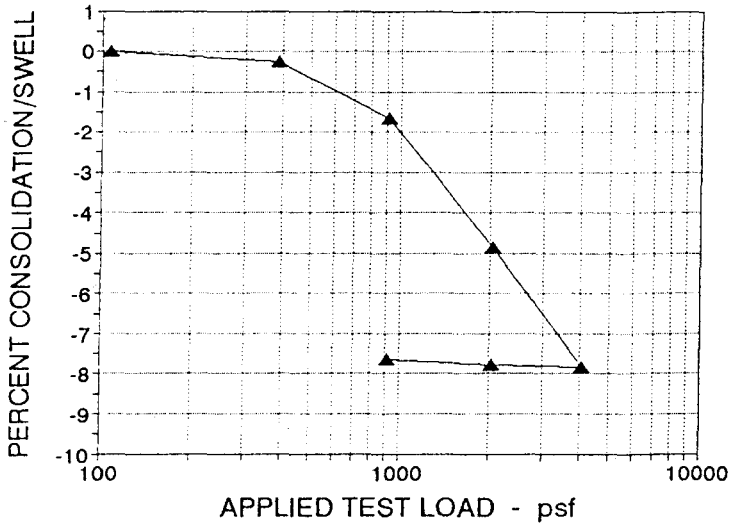


LOAD SUMMARY

106	*psf SEATING LOAD*
921	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.18	*% SAMPLE REBOUND @ UNLOAD*
7.83	*% MAXIMUM CONSOLIDATION*
4069	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	92.6	100.4	100.3
SOIL MOISTURE (%)	29.3%	24.4%	24.5%
CONSOLIDATION (%)	-0-	7.83%	7.65%
VOID RATIO (e)	0.786	0.646	0.649
SATURATION (%)	99%	100%	100%

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

SOIL CONSOLIDATION ASTM D-2435

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

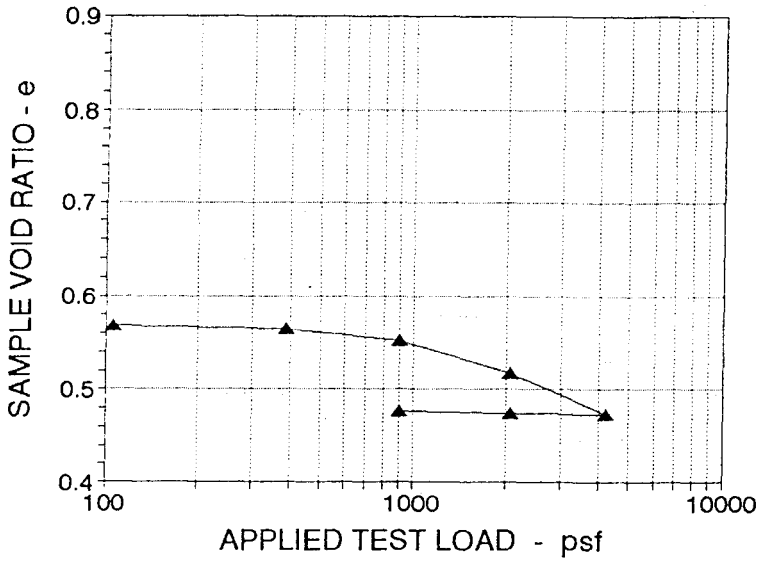
SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

Job No. **84768-J**

Drawn **EMM**

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



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

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

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

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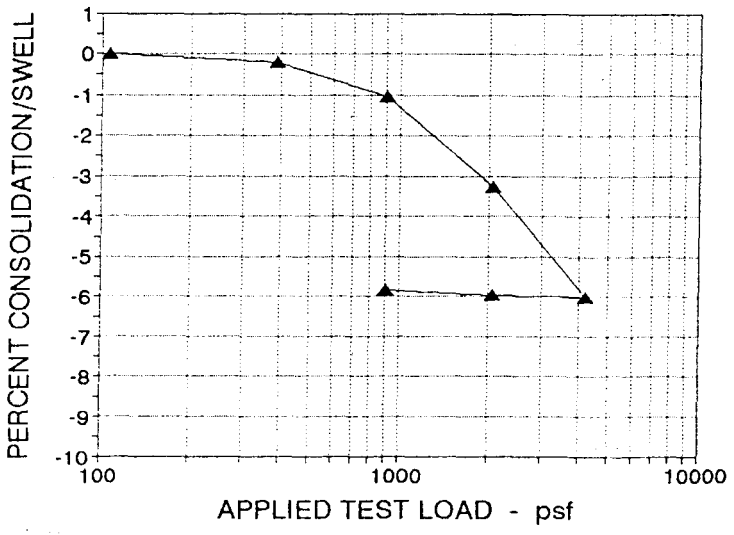

LOAD SUMMARY

106	*psf SEATING LOAD*
904	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.18	*% SAMPLE REBOUND @ UNLOAD*
6.02	*% MAXIMUM CONSOLIDATION*
4210	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	105.8	112.6	112.4
SOIL MOISTURE (%)	11.4%	17.8%	17.9%
CONSOLIDATION (%)	-0-	6.02%	5.84%
VOID RATIO (e)	0.568	0.474	0.477
SATURATION (%)	54%	100%	100%

SOIL #:	II
SOIL TYPE:	ML-CL
TEST HOLE #:	3 @ 8'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
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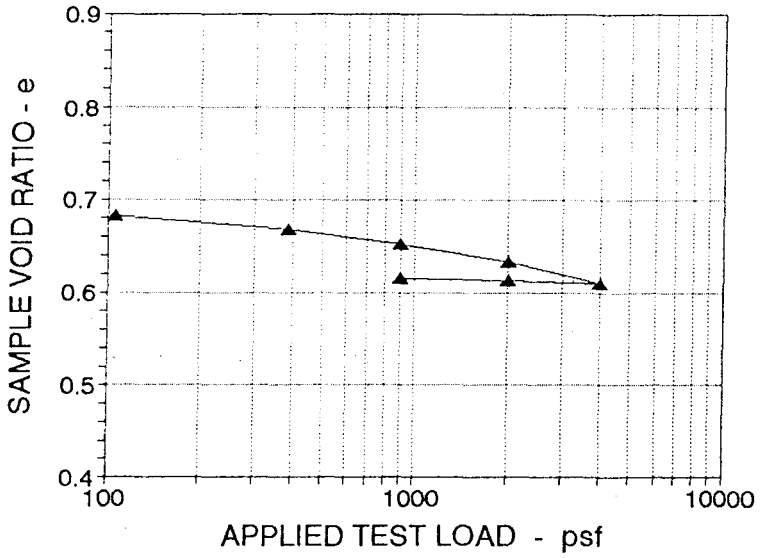

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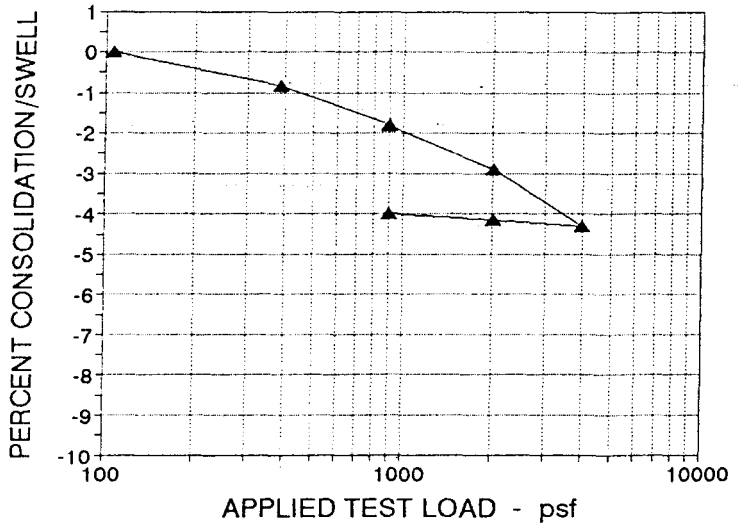

LOAD SUMMARY

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

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	98.3	102.7	102.4
SOIL MOISTURE (%)	10.7%	23.0%	23.3%
CONSOLIDATION (%)	-0-	4.29%	4.00%
VOID RATIO (e)	0.683	0.610	0.615
SATURATION (%)	41%	100%	100%

SOIL #:	II
SOIL TYPE:	ML-CL
TEST HOLE #:	5 @ 3'
SAMPLE Gs:	2.65
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

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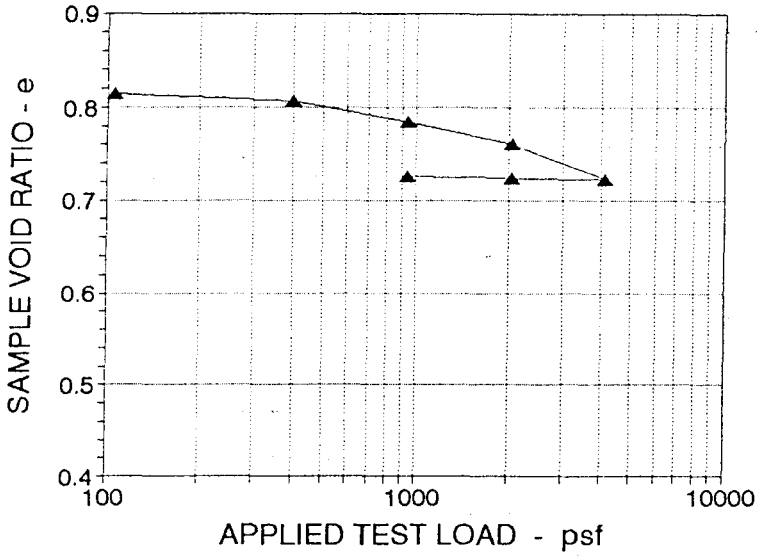

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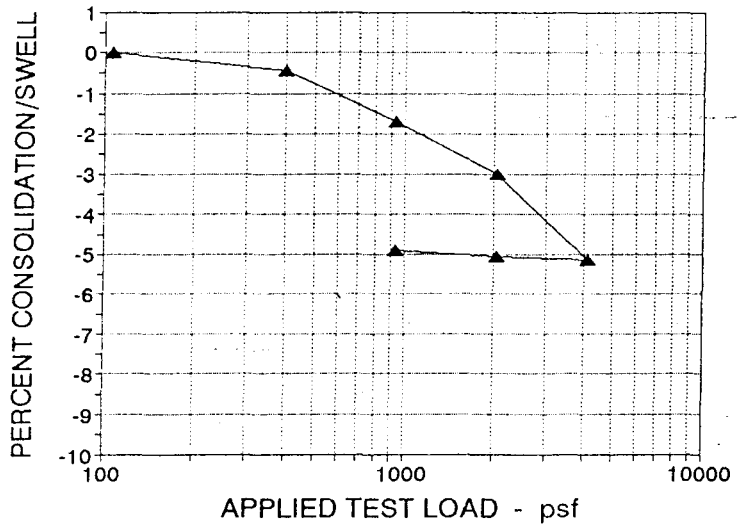

LOAD SUMMARY

106	*psf SEATING LOAD*
936	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.22	*% SAMPLE REBOUND @ UNLOAD*
5.12	*% MAXIMUM CONSOLIDATION*
4116	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	91.5	96.4	96.2
SOIL MOISTURE (%)	18.8%	27.1%	27.4%
CONSOLIDATION (%)	-0-	5.12%	4.90%
VOID RATIO (e)	0.815	0.722	0.726
SATURATION (%)	62%	100%	100%

SOIL #:	II
SOIL TYPE:	ML-CL
TEST HOLE #:	7 @ 8'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

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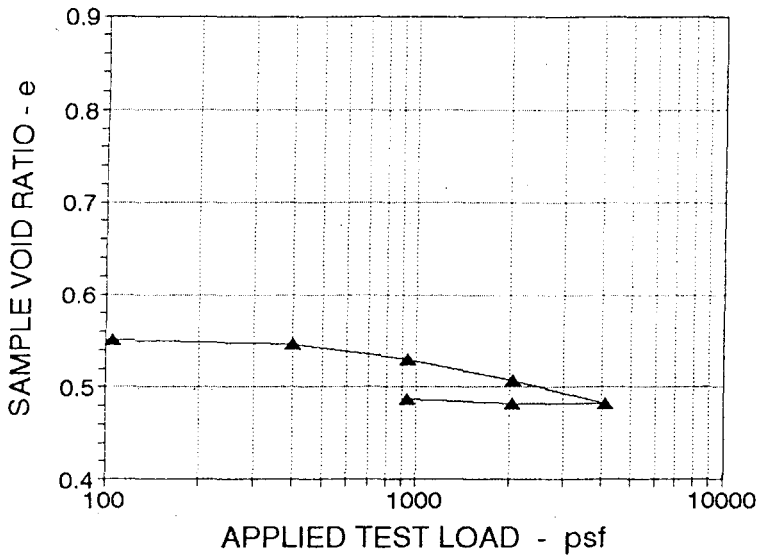

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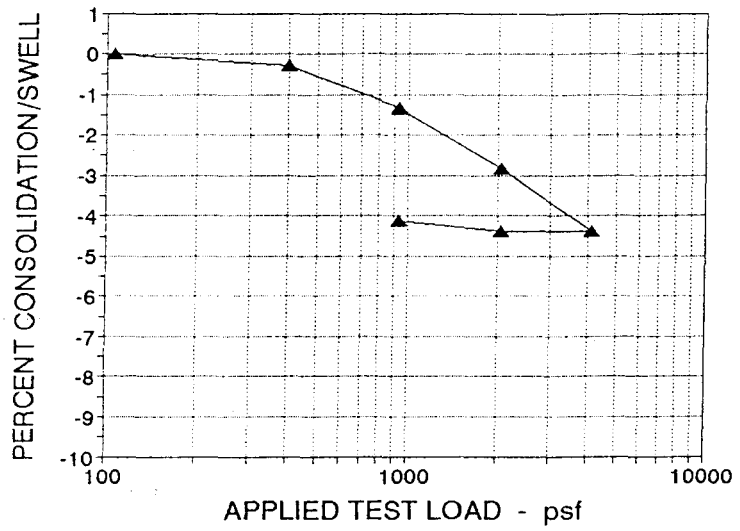

LOAD SUMMARY

106	*psf SEATING LOAD*
936	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.27	*% SAMPLE REBOUND @ UNLOAD*
4.4	*% MAXIMUM CONSOLIDATION*
4116	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	106.6	111.5	111.2
SOIL MOISTURE (%)	17.7%	18.2%	18.3%
CONSOLIDATION (%)	-0-	4.40%	4.13%
VOID RATIO (e)	0.551	0.482	0.487
SATURATION (%)	85%	100%	100%

SOIL #:	I
SOIL TYPE:	ML-CL
TEST HOLE #:	10 @ 3'
SAMPLE Gs:	2.65
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

LINCOLN - DeVORE, Inc.

Geotechnical Consultants
Grand Junction, Colorado

Job No. **84768-J**

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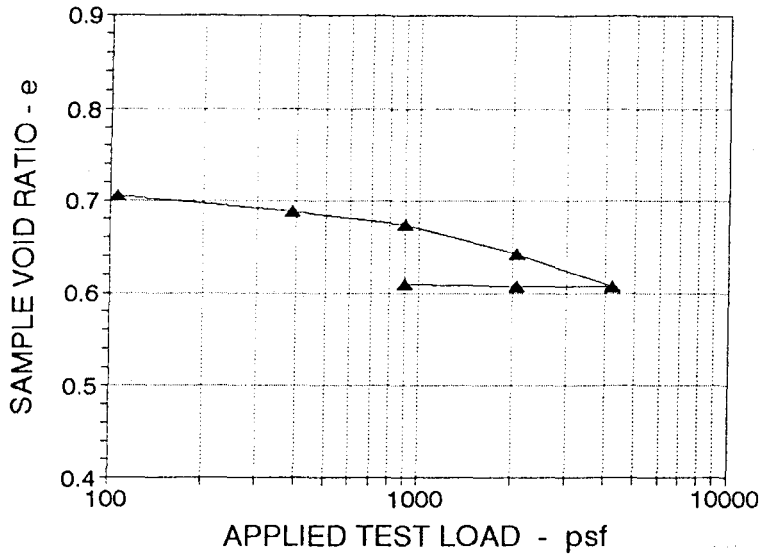

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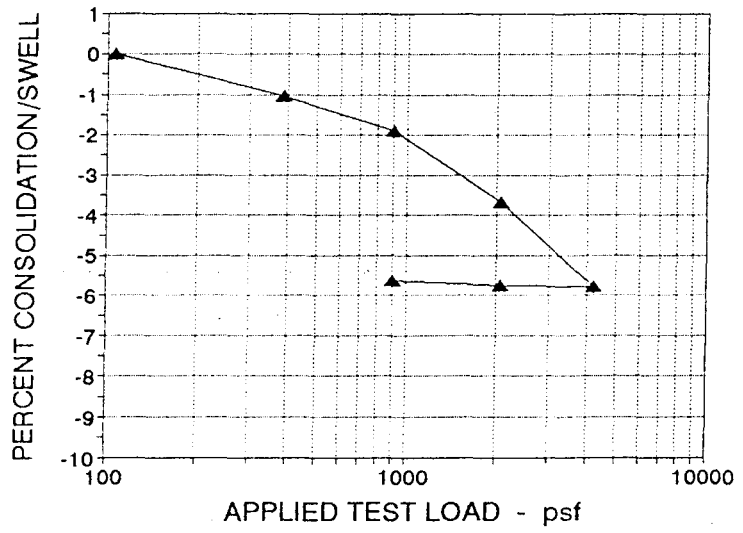

LOAD SUMMARY

106	*psf SEATING LOAD*
904	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.17	*% SAMPLE REBOUND @ UNLOAD*
5.78	*% MAXIMUM CONSOLIDATION*
4210	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	97.3	103.3	103.1
SOIL MOISTURE (%)	21.1%	22.8%	22.9%
CONSOLIDATION (%)	-0-	5.78%	5.61%
VOID RATIO (e)	0.706	0.607	0.610
SATURATION (%)	79%	100%	100%

SOIL #:	II
SOIL TYPE:	ML-CL
TEST HOLE #:	10 @ 8'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

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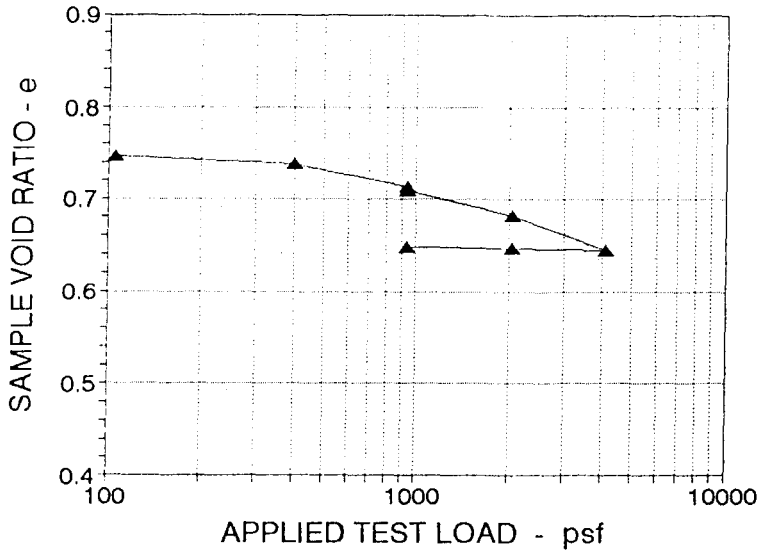

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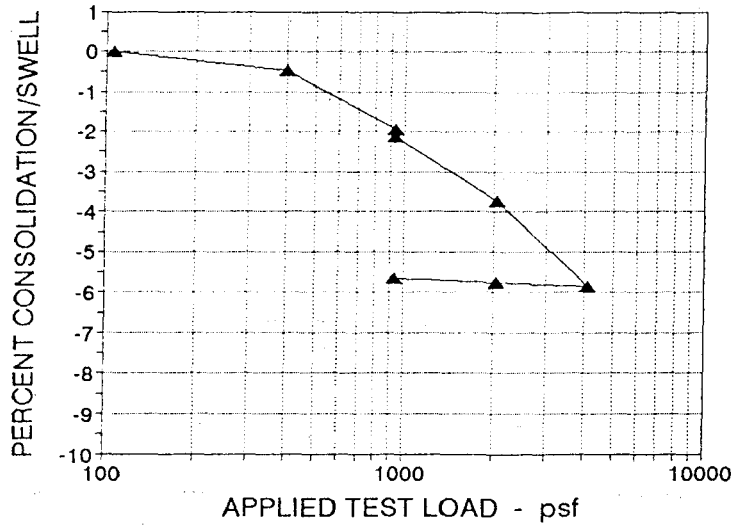


LOAD SUMMARY

106	*psf SEATING LOAD*
936	*psf SAMPLE SATURATED*
0.21	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.2	*% SAMPLE REBOUND @ UNLOAD*
5.85	*% MAXIMUM CONSOLIDATION*
4116	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	94.7	100.6	100.3
SOIL MOISTURE (%)	27.0%	24.3%	24.4%
CONSOLIDATION (%)	-0-	5.85%	5.65%
VOID RATIO (e)	0.747	0.645	0.648
SATURATION (%)	96%	100%	100%

SOIL #:	II
SOIL TYPE:	ML-CL
TEST HOLE #:	5 @ 8'
SAMPLE Gs:	2.65
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**

SAFEWAY ZONING

Document: I:\FINANCE\CLERK\ORDINANC\ORD2882.ORD

CITY OF GRAND JUNCTION, COLORADO

ORDINANCE No. 2882

Ordinance Zoning the Waymeyer/Schultz Annexation

Recitals.

The following properties have been annexed to the City of Grand Junction as the Waymeyer/Schultz Annexation and require a City zoning designation be applied to the properties.

After public notice and public hearing as required by the Grand Junction Zoning and Development Code, the Grand Junction Planning Commission recommended approval of the following zone of annexation.

The City Council finds that the requested zoning is in conformance with the stated criteria of section 4-4-4 and section 4-11 of the Grand Junction Zoning and Development Code.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF GRAND JUNCTION THAT:

The following described properties be zoned Residential Single Family with a maximuim of 4 unit per acre (RSF-4):

BEG S 508FT + N89DEG59'W 30FT FR NE COR SEC 7 1S 1E S 120FT N89DEG59'W 92FT N 120FT S89DEG59'E 92FT TO BEG

The following described properties be zoned Planned Business (PB) with the following conditions:

BEG SW COR NW4NW4NW4 SEC 8 1S 1E N 125FT E 330FT S 125FT W TO BEG

PB Zone Description & Conditions

The uses allowed in this PB Zone District will be all land uses allowed in the City's Heavy Business (B-3) Zone excluding the following:

1) "Outside Sale Retail Goods"

Land uses allowed with a special use permit or a conditional use permit in B-3 will be allowed in the PB zone district when a special use permit or a conditional use permit is obtained respectively. All requirements subject to such permits shall be those requirements and conditions as per the Zoning and Development Code at the time of development.

All Land Uses in the B-3 Zone District allowed by right, or with a Special Use Permit, or a Conditional Use permit shall abide by the requirements as specified by the Grand Junction Zoning and Development Code at the time of development for the B-3 zone district.

BULK/LANDSCAPING/PARKING REQUIREMENTS: The bulk/landscaping/ parking requirements for this PB Zone District will be the same as those found for the B-3 Zone District as specified by the Grand Junction Zoning and Development Code at the time of development.

SIGNAGE REQUIREMENTS: All signage regulations will be the same as those found for the B-3 Zone District as specified by the Grand Junction Zoning and Development Code at the time of development with the following exception:

1) Freestanding signs shall be monument signs and shall not exceed 10 feet in height.

DEVELOPMENT PROCESS: The **Waymeyer** property (2943-082-00-011) will be treated for all purposes in the development process as a property carrying a B-3 zoning classification or later equivalent, subject to the signage and land use restrictions stated above.

Introduced on first reading this 15th day of November, 1995.

PASSED and ADOPTED on second reading this 6th day of December, 1995.

/s/ Ron Maupin
Mayor

ATTEST:

/s/ Stephanie Nye
City Clerk

WESTERN
COLORADO
TESTING,
INC.

ASPHALTIC CONCRETE JOB MIX FORMULA
1/2" INCH MINUS -50 BLOW MARSHALL
RAILHEAD PIT - GRADING "CX"
GRAND JUNCTION, COLORADO

Prepared For:

United Companies, Inc.
P.O. Box 3609
Grand Junction, Colorado 81502

Prepared by:

Western Colorado Testing, Inc.
529 25 1/2 Road, Suite B-101
Grand Junction, Colorado 81505
(970) 241-7700

March 4, 1996
Job No. 801696

FRANCIS CONSTRUCTORS, INC.
REVIEW OF THIS SUBMITTAL IS SUBJECT TO THE PROVISIONS OF THE CONTRACT DRAWINGS AND SPECIFICATIONS. THIS ACTION IS FOR GENERAL CONCURRENCE ONLY.
☑ REVIEWED
☐ REVIEWED WITH NOTATIONS INDICATED RESUBMITTAL NOT REQUIRED
☐ REVIEWED WITH NOTATIONS INDICATED RESUBMIT WITH CORRECTIONS
☐ DISAPPROVED, RESUBMIT
SUBMITTAL REVIEWED BY BH. DATE 3/14/96

WESTERN
COLORADO
TESTING,
INC.

529 25 1/2 Road, Suite B-101
Grand Junction, Colorado 81505
(970) 241-7700

March 4, 1996
WCT #801696

United Companies, Inc.
P.O. Box 3609
Grand Junction, Colorado 81502

Attention: Mr. Gary DeJarnatt

Project: 1/2" Inch Minus Asphaltic Concrete Job Mix Formula
50-Blow Marshall,
Railhead Pit - Grading "CX"
Grand Junction, Colorado 81502

As requested, a 50-Blow Marshall Method job mix formula was developed for the above project. Aggregates for the mix were from the Railhead Pit in Grand Junction, Colorado. Upon completion of the aggregate quality testing, individual gradations and a composite gradation were determined as presented in the gradation summary table on page 5. The asphalt cement used was AC10 provided by Sinclair Oil Company.

Source proportions for this job mix formula are:

(-) 3/4" Crushed Rock	3%
(-) 1/2" Crushed Rock	39%
(-) 1/4" Crushed Fines	38%
(-) 5/8" Natural Fines	20%

The asphaltic concrete mix was designed using procedures outlined in Chapter 5, Marshall Method of Mix Design, of the Asphalt Institute's Mix Design Methods for Asphaltic Concrete, Manual Series No. 2 (MS-2). The mixing temperature was 290 degrees ± 5 degrees F, and the compaction temperature was 275 degrees ± 5 degrees F. The viscosity of the AC at these temperatures is approximately 170 cS and 280 cS, respectively.

United Companies, Inc.
Railhead Pit-Grading "CX"
March 4, 1996
WCT #801696

Optimum test properties obtained with the corresponding asphalt cement content are:

Test	Result	Asphalt Cement, %
Stability, lbs.	3240	5.6
Unit Weight, pcf	146.5	6.5
Air Voids, %	3.9	5.6

The recommended design asphalt cement content is 5.6 ± 0.5 percent by total weight of mixture. The physical properties of this mix at this AC content are:

Test	Result	Typical Project Specifications
Stability, lbs.	3240	1200 min
Flow, .01 in.	10	8-16
Unit Weight, pcf	145.4	-
Effective Voids, %	3.9	3-5
V.M.A., %	15.2	13.9 min
Max. Theo. Density, pcf	151.3	-
Sp.G. of AC*	1.0313	-

* *AC10 asphalt supplied by Sinclair Oil Company.*

** *Per Table 5.3, Mix Design Methods for Asphaltic Concrete and Other Hot Mix Types, Manual Series No. 2 (MS-2, Sixth Edition).*

United Companies, Inc.
Railhead Pit-Grading "CX"
March 4, 1996
WCT #801696

The specific gravity and absorption properties of the different aggregates are:

Test	(-)3/4" Crushed Rock	(-)1/2" Crushed Rock	(-)1/4" Crushed Fines	(-)5/8" Natural Fines	Composite
Oven Dry Sp.G.	2.623	2.607	2.613	2.557	2.600
Bulk S.S.D. Sp.G.	2.649	2.639	2.644	2.607	2.635
Effective Sp.G.	-	-	-	-	2.644
Apparent Sp.G.	2.693	2.691	2.696	2.693	2.693
Absorption, % (water)	1.00	1.18	1.17	1.98	1.33
Absorption, % (asphalt)	-	-	-	-	0.67

Aggregate quality properties for the composite mix are:

Test	Result	Specification
L.A. Abrasion, % wear at 500 rev.	17.2	45 max
Liquid Limit	NV	-
Plasticity Index	NP	NP
Fractured Face Count, One Face,%	98	-
Fractured Face Count, Two Faces, %	91.4	60 min

Limitations:

The asphaltic concrete job mix formula and recommendations given herein are based upon specific materials, gradation and design procedures. Slight variation in test results of laboratory prepared mixes due to multi-laboratory precision, slight variation in materials, gradation and design procedures are to be expected.

All of these factors should be considered when job mix verification of laboratory mixes is performed.

All of the physical properties of the mix should be retested and re-evaluated for hot plant produced material. It is often necessary to make adjustments to the job mix formula to account for the changed environment between the laboratory and field produced material. Should the source or physical characteristics of the materials change substantially, the development of a new or revised job mix formula is recommended.

If there are any questions regarding this information, or if we may be of additional assistance, please do not hesitate to contact us.

Respectfully submitted,
WESTERN COLORADO TESTING, INC.

Gary L. Hamacher, P.E.
Technical Director

GLH/cc
msa:8016mixb.doc

United Companies, Inc.
Railhead Pit-Grading "CX"
March 4, 1996
WCT #801696

MARSHALL SUMMARY

GRADATION

Sieve Size	(-)3/4" Crushed Rock	(-)1/2" Crushed Rock	(-)1/4" Crushed Fines	(-)5/8" Natural Fines	Composite	Job Mix	Spec.
1"	100	100	100	100	100	-	-
3/4"	100	100	100	100	100	100	100
1/2"	35	100	100	99	98	92-100	90-100
3/8"	6	82	100	92	89	83-95	74-89
No. 4	1	8	94	79	55	50-60	50-78
No. 8	1	3	64	71	40	35-45	32-64
No. 16	1	2	47	66	32	-	-
No. 30	1	2	35	57	26	22-30	12-38
No. 50	1	2	24	25	15	-	-
No. 100	1	1	16	12	9	-	-
No. 200	0.8	1.2	10.3	8.1	6.0	4.0-8.0	3-7
as used	3%	39%	38%	20%	100%	-	-

Percent passing by weight.

United Companies, Inc.
Railhead Pit-Grading "CX"
March 4, 1996
WCT #801696

MARSHALL SUMMARY
PHYSICAL PROPERTIES

Test Results	1	2	3	4	5
Percent Oil	5.0	5.5	5.6	6.0	6.5
Sample Specific Gravity	2.306	2.331	2.336	2.347	2.354
Sample Unit Wt., pcf	143.5	145.1	145.4	146.1	146.5
Rice Specific Gravity	2.452	2.435	2.431	2.417	2.400
Rice Unit Wt., pcf	152.6	151.5	151.3	150.4	149.4
Voids in Mineral Agg.,%	15.7	15.3	15.2	15.1	15.3
Effective Voids	6.0	4.2	3.9	2.9	1.9
Voids filled, %	62	72	74	81	87
Stability	3100	3220	3240	3200	3000
Flow	9	10	10	11	13

Oil: Sinclair AC10 Gb: 1.0313 g/cc

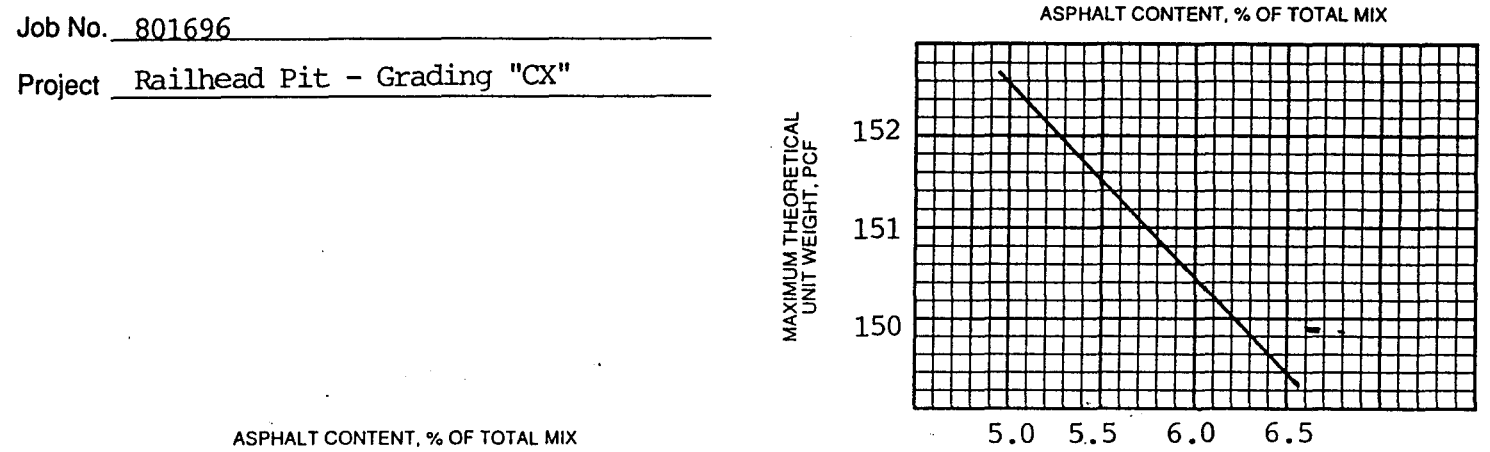
WESTERN COLORADO TESTING, INC.

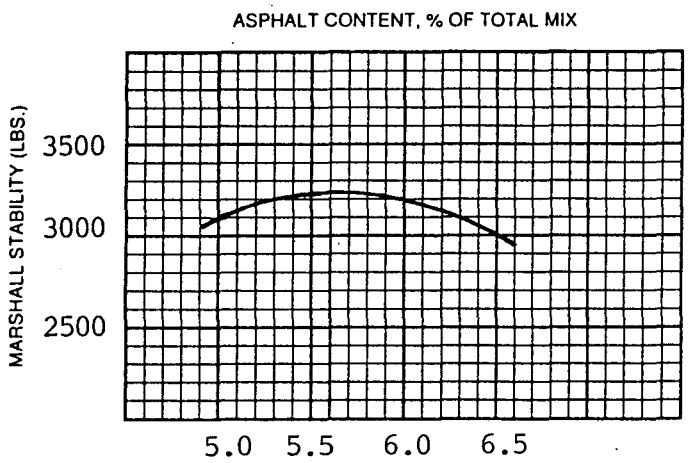
TESTING PROPERTY CURVES
ASPHALT PAVING MIX DESIGN
MARSHALL METHOD

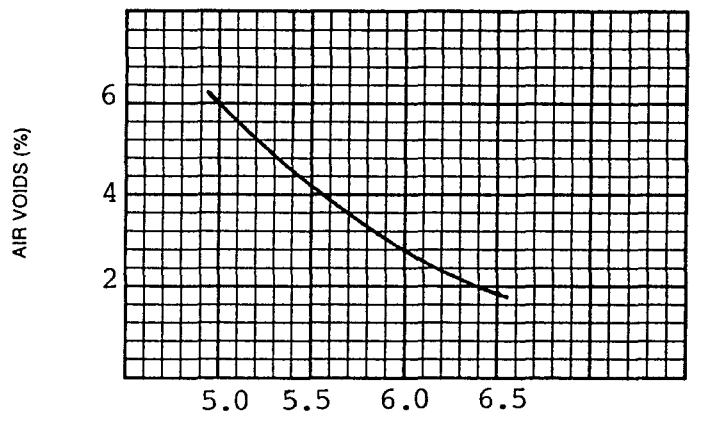
Client United Companies, Inc.

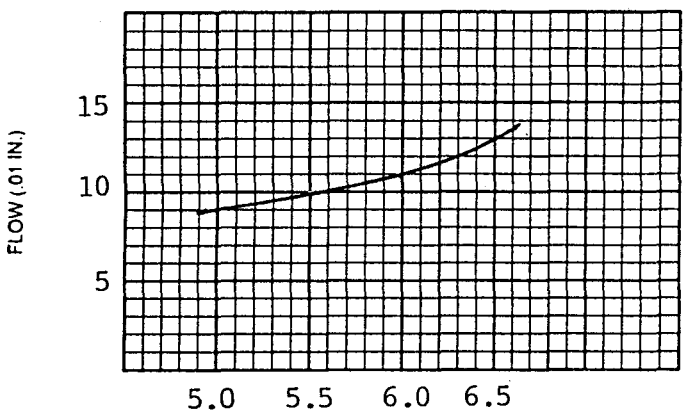
Job No. 801696

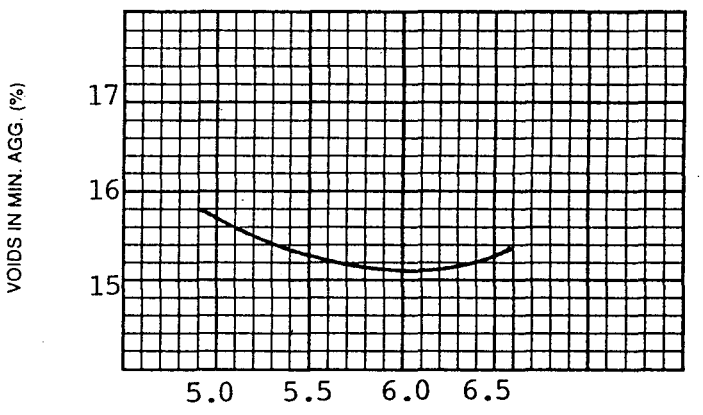
Project Railhead Pit - Grading "CX"

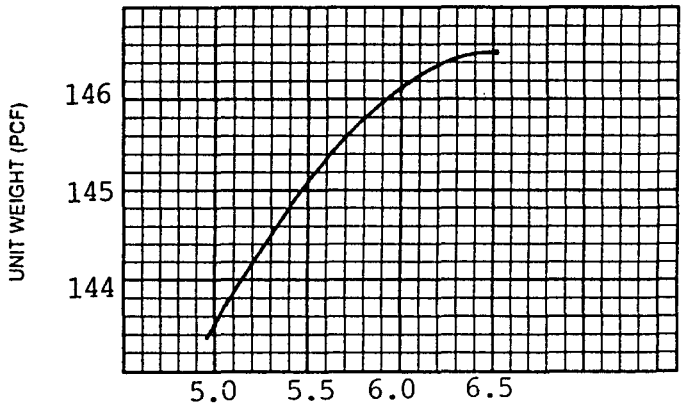


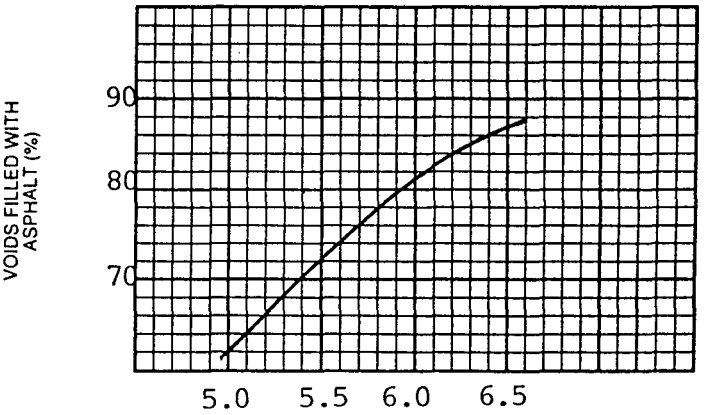












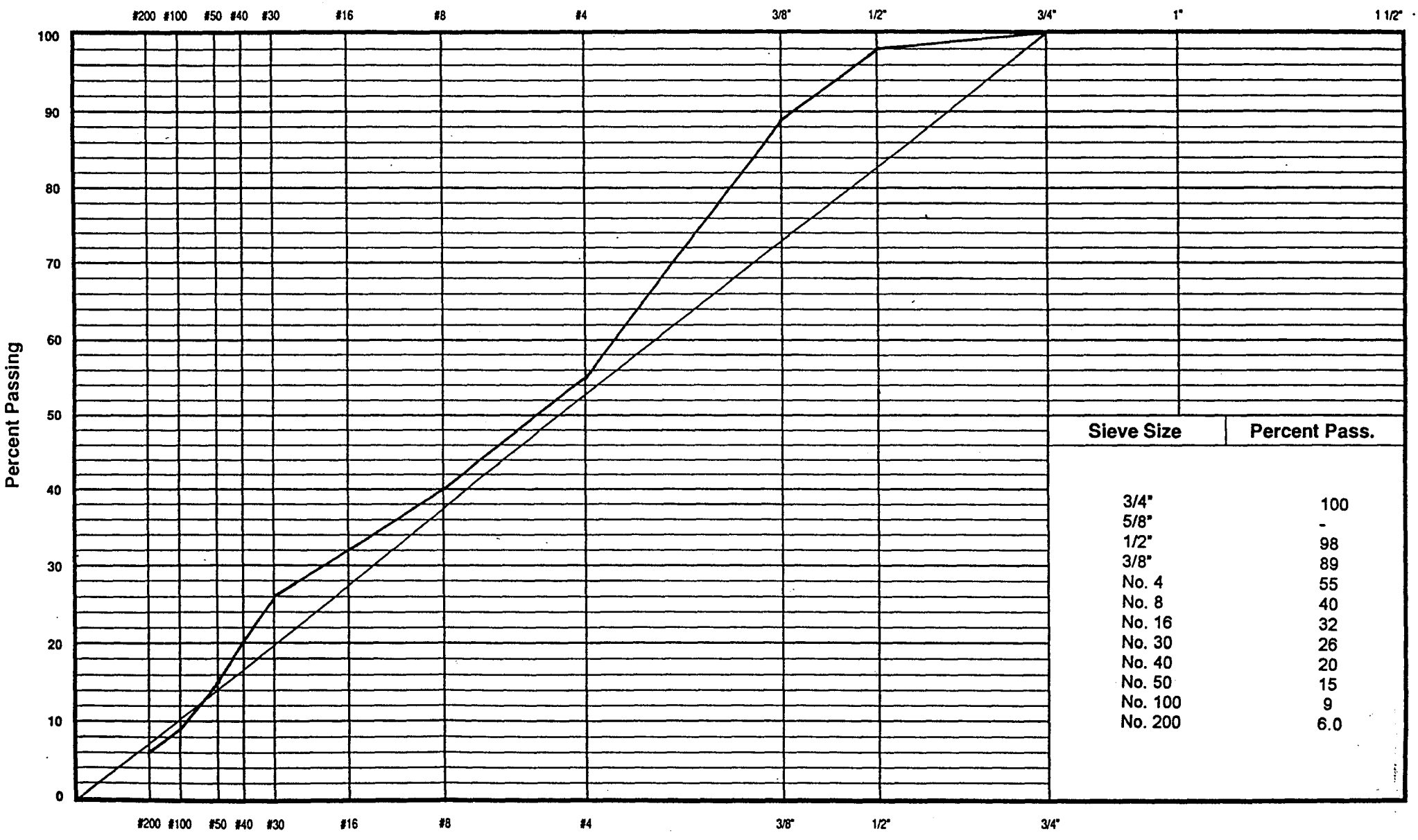
WESTERN COLORADO TESTING, INC.

Client United Companies, Inc.

Location Railhead Pit, Grand Junction, Colorado

Date 3-4-96 Job No. 801696

Sieve Sizes Raised to the 0.45 Power



Sieve Size	Percent Pass.
3/4"	100
5/8"	-
1/2"	98
3/8"	89
No. 4	55
No. 8	40
No. 16	32
No. 30	26
No. 40	20
No. 50	15
No. 100	9
No. 200	6.0

Mix Data

Mix: 50 Blow Marshall Grading: CDOT "CX"

WESTERN
COLORADO
TESTING,
INC.

ASPHALTIC CONCRETE JOB MIX FORMULA
5/8 INCH MINUS - 75 BLOW MARSHALL
CITY OF GRAND JUNCTION - 1995 PAVING
GRAND JUNCTION, COLORADO

Prepared For:

United Companies, Inc.
P. O. Box 3609
Grand Junction, CO 81502

Prepared by:

Western Colorado Testing, Inc.
529 25 1/2 Road, Suite B-101
Grand Junction, Colorado 81505
(970) 241-7700

July 19, 1995
Job No. 602895A

WESTERN COLORADO TESTING, INC.

529 25 1/2 Road, Suite B-101
Grand Junction, Colorado 81505
(303) 241-7700

July 19, 1995
WCT #602895A

United Companies, Inc.
P. O. Box 3609
Grand Junction, CO 81502

Attention: Mr. Gary DeJarnatt

Project: 5/8 Inch Minus Asphaltic Concrete Job Mix Formula
75-Blow Marshall, City of Grand Junction
1995 Paving

As requested, a 75-Blow Marshall Method Job Mix Formula was developed for the above project. Aggregates for the mix were sampled from the 18 Road Pit located in Fruita, Colorado. Upon completion of aggregate quality testing, individual stockpile gradations and a composite gradation were determined as presented in the job mix formula summary table on page 5. The asphalt cement used was AC-10 provided by the Sinclair Oil Company, Sinclair, Wyoming, fortified with 0.5% Pavebond Special.

Source proportions for this job mix formula are:

(-)5/8" Crushed Rock	32%
Crushed Fines	30%
Natural Fines	38%

The asphaltic concrete mix was designed using procedures outlined in Chapter 5, Marshall Method of Mix Design, of the Asphalt Institute's Mix Design Methods for Asphaltic Concrete, Manual Series No. 2 (MS-2, Sixth Edition, 1993). The mixing temperature was 290 degrees ± 5 degrees F, and the compaction temperature was 275 degrees ± 5 degrees F. The viscosity of the AC at these temperatures is approximately 170 cS and 280 cS, respectively.

United Companies, Inc.
5/8 Inch Minus, 75-Blow Marshall
July 19, 1995
WCT #602895A

Optimum test properties obtained with the corresponding asphalt cement content are:

Test	Result	Asphalt Cement, %
Stability, lbs.	2700	6.1
Unit Weight, pcf	147.2	6.3
Air Voids, %	4.0	5.4

The recommended design asphalt cement content is 5.3 $\pm$ 0.3 percent by total weight of mixture. The physical properties of this mix at this AC content are:

Test	Result	Typical Project Specifications
Stability, lbs.	2490	1800 min.
Flow, .01 in.	8	8 - 18
Unit Weight, pcf	145.2	-
Effective Voids, %	4.2	3 - 5
V.M.A., %	14.5	14.2 min**
Max. Theo. Density, pcf	151.5	-
Sp.G. of AC*	1.0313	-

* AC-10 asphalt supplied by Sinclair Oil Company, Sinclair, Wyoming.

** Per Table 5.3, Mix Design Methods for Asphaltic Concrete and Other Hot Mix Types, Manual Series No. 2 (MS-2, Sixth Edition).

United Companies, Inc.
5/8 Inch Minus, 75-Blow Marshall
July 19, 1995
WCT #602895A

The specific gravity and absorption properties of the different aggregates are:

Test	(-)5/8" Rock	Crushed Fines	Natural Fines	Composite
Oven Dry Sp.G.	2.634	2.614	2.537	2.591
Bulk S.S.D. Sp.G.	2.667	2.646	2.589	2.631
Effective Sp.G.	--	--	--	2.635
Apparent Sp.G.	2.724	2.699	2.679	2.699
Absorption, % (water)	1.25	1.21	2.10	1.56
Absorption, % (asphalt)	--	--	--	0.67

Aggregate quality properties for the composite mix are:

Test	Result	Specification
L.A. Abrasion, % wear at 500 rev.	20.0	40 Max.
Fractured Faces, % (one face)	97.3	--
Fractured Faces, % (two faces)	94.5	60 Min.
Liquid Limit	No Value	
Plasticity Index	Non Plastic	NP
Sand Equivalent Value	56	45 Min.

Testing for accelerated moisture susceptibility, tensile strength retained (Lottman) ASTM D-4867 indicates a tensile strength retained of 88% and a dry split tensile strength of 57 psi. Lottman test data is summarized on page 7.

United Companies, Inc.
5/8 Inch Minus, 75-Blow Marshall
July 19, 1995
WCT #602895A

Limitations:

The asphaltic concrete job mix formula and recommendations given herein are based upon specific materials, gradation and design procedures. Slight variation in test results of laboratory prepared mixes due to multi-laboratory precision, slight variation in materials, gradation and design procedures are to be expected. All of these factors should be considered when job mix verification of laboratory mixes is performed.

All of the physical properties of the mix should be retested and re-evaluated for hot plant produced material. It is often necessary to make adjustments to the job mix formula to account for the changed environment between the laboratory and field produced material. Should the source or physical characteristics of the materials change substantially, the development of a new or revised job mix formula is recommended.

If there are any questions regarding this information, or if we may be of additional assistance, please do not hesitate to contact us.

Respectfully submitted

WESTERN COLORADO TESTING, INC.

Gary L. Hamacher, P.E.
Technical Director

GLH/ss

United Companies, Inc.
5/8 Inch Minus, 75-Blow Marshall
July 19, 1995
WCT #602895A

MARSHALL SUMMARY
GRADATION

Sieve Size	(-)5/8" Rock	Crushed Fines	Natural Fines	Composite	Job Mix	Specification
5/8"	100	100	100	100	100	100
1/2"	83	100	99	94	88-100	70-95
3/8"	52	100	90	81	75-87	60-88
No. 4	5	95	72	57	52-62	44-72
No. 8	1	64	62	43	38-48	30-62
No. 16	1	45	56	35	--	--
No. 30	1	33	43	27	23-31	12-38
No. 50	1	23	18	14	--	--
No. 100	1	14	9	8	--	--
No. 200	0.7	9.0	5.8	5.1	3.1-7.1	3-7
as used	32%	30%	38%	100%	--	--

Percent passing by weight

United Companies, Inc.
5/8 Inch Minus, 75-Blow Marshall
July 19, 1995
WCT #602895A

MARSHALL SUMMARY
PHYSICAL PROPERTIES

Test Results	1	2	3	4	5
Percent Oil	5.0	5.3	5.5	6.0	6.5
Sample Specific Gravity	2.298	2.333	2.344	2.362	2.362
Sample Unit Wt., pcf	143.0	145.2	145.9	147.0	147.0
Rice Specific Gravity	2.445	2.434	2.427	2.410	2.393
Rice Unit Wt., pcf	152.2	151.5	151.1	150.0	148.9
Voids in Mineral Agg.,%	15.5	14.5	14.2	14.0	14.5
Effective Voids	6.0	4.2	3.4	2.0	1.3
Voids filled, %	61	71	76	86	91
Stability	2210	2490	2530	2690	2610
Flow	8	8	8	9	10

Oil: Sinclair Oil Company, AC-10 Gb: 1.0313 g/cc

United Companies, Inc.
5/8 Inch Minus, 75-Blow Marshall
July 19, 1995
WCT #602895A

LOTTMAN TEST RESULTS

Dry	
Sp.G	S_t
2.277	54
2.268	57
2.241	60
Average	57

Conditioned	
Sp.G.	S_t
2.263	44
2.257	51
2.255	54
Average	50

$$\textit{Tensile Strength Retained} = \frac{50}{57} \times 100 = 88\%$$

Dry	Conditioned
Effective Voids = 6.9%	Effective Voids = 7.1%
	Permeable Voids = 5.4%
	Percent Saturation = 76.7%

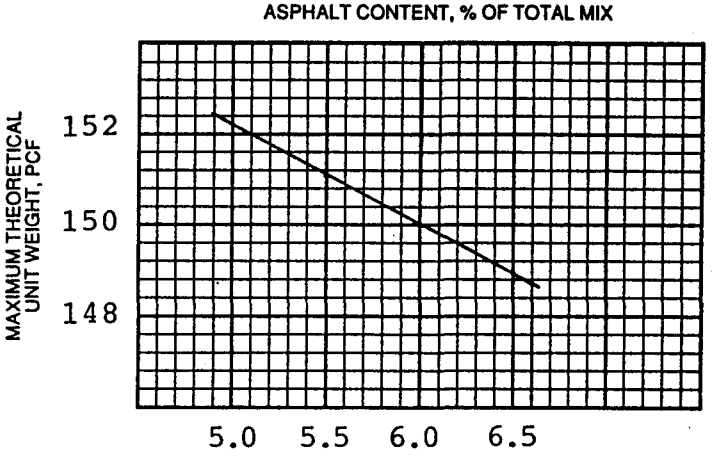
WESTERN COLORADO TESTING, INC.

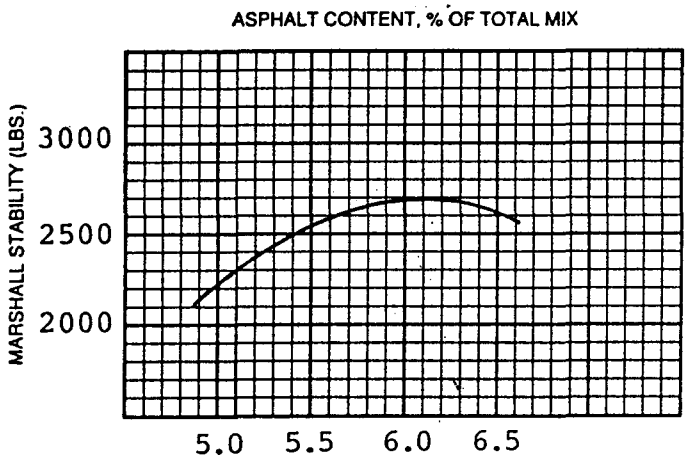
TESTING PROPERTY CURVES
ASPHALT PAVING MIX DESIGN
MARSHALL METHOD

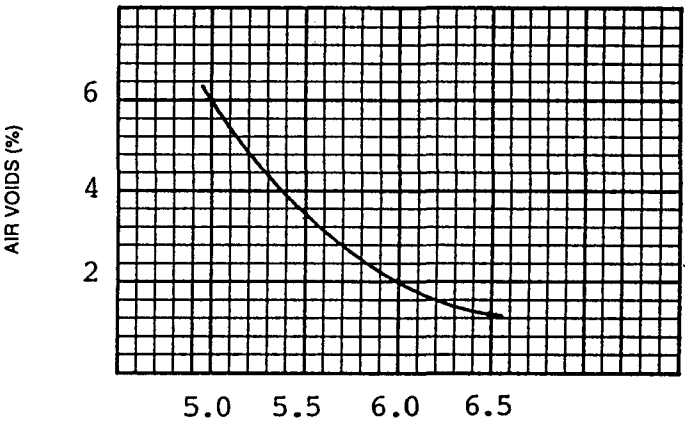
Client United Companies, Inc.

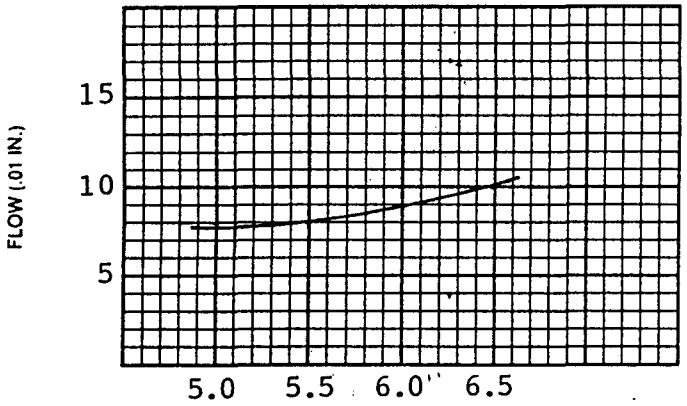
Job No. 602895A

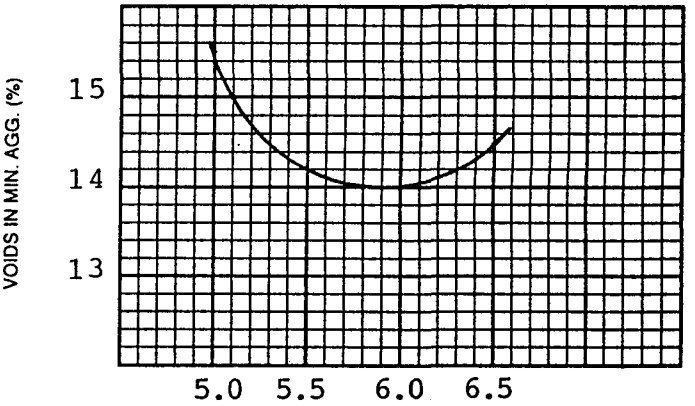
Project City of Grand Junction
1995 Paving

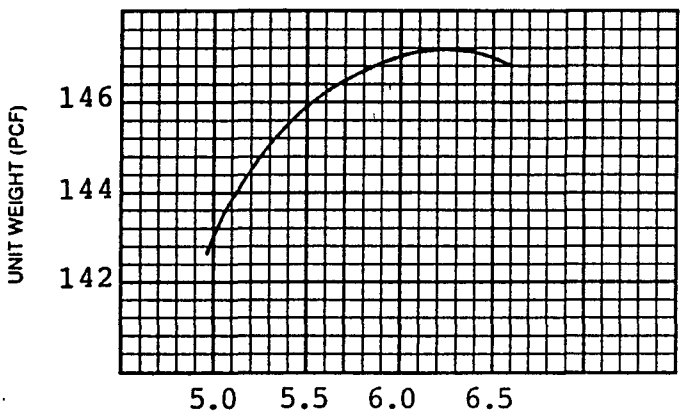


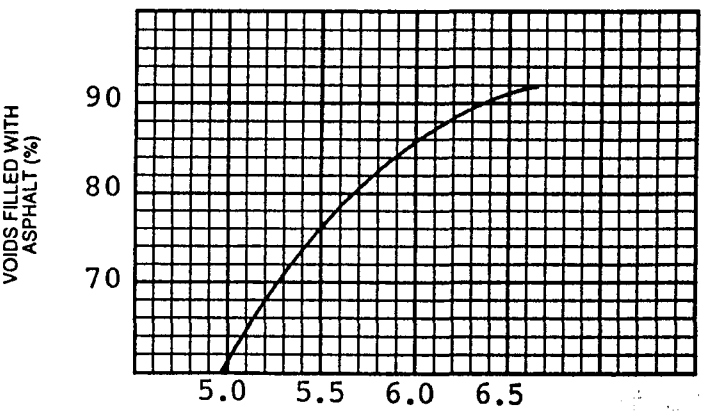












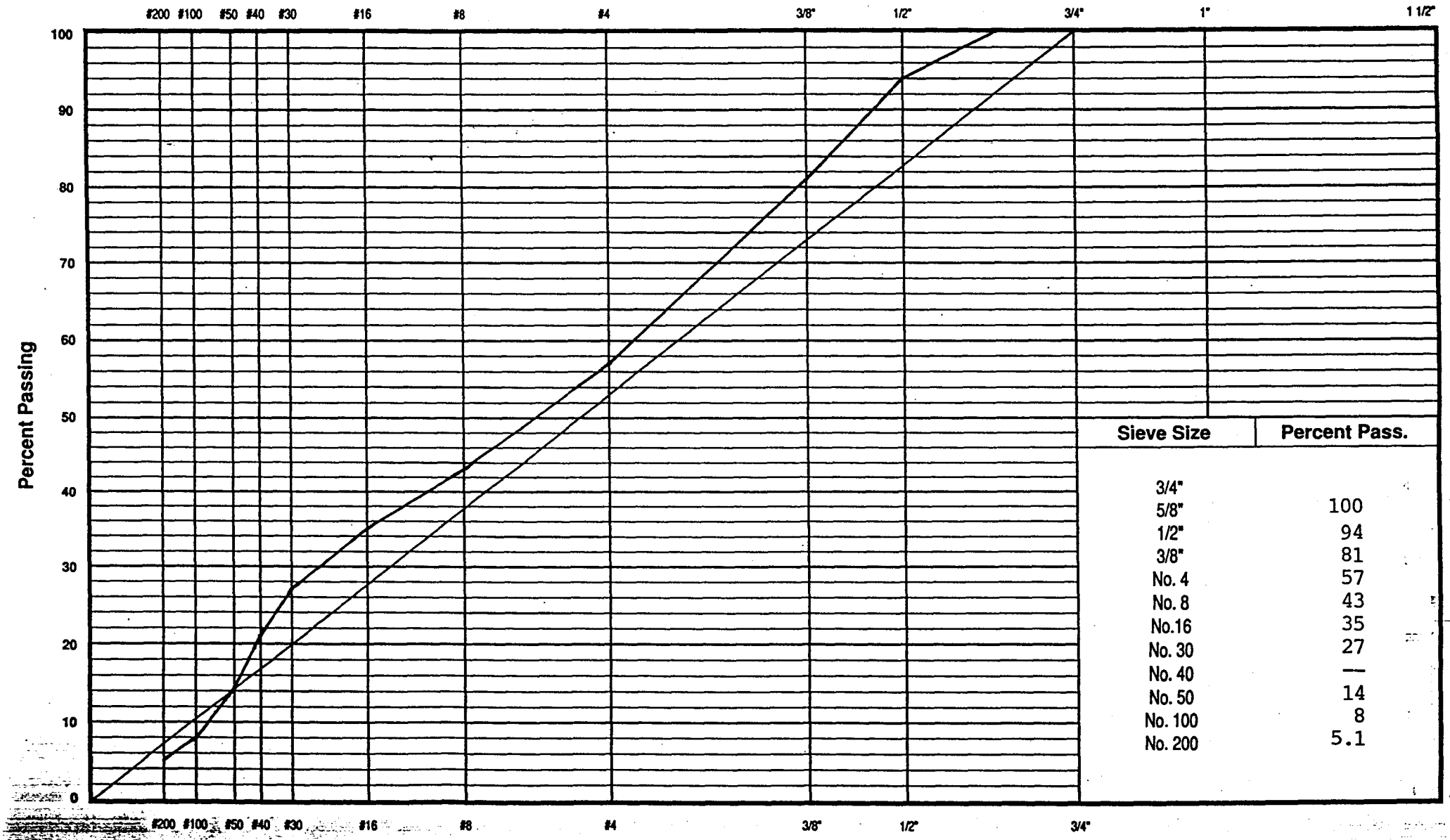
WESTERN COLORADO TESTING, INC.

Client United Companies, Inc.

Location City of Grand Junction - 1995 Paving

Date 7/19/95 Job No. 602895A

Sieve Sizes Raised to the 0.45 Power



Sieve Size	Percent Pass.
3/4"	
5/8"	100
1/2"	94
3/8"	81
No. 4	57
No. 8	43
No.16	35
No. 30	27
No. 40	—
No. 50	14
No. 100	8
No. 200	5.1

Mix Data

Mix: 75-Blow Marshall Grading: CDOT "C"

SINCLAIR, OIL CORPORATION

SINCLAIR, WYOMING REFINERY

AC-10

			ASTM
Specific Gravity @ 60/60°F	1.0321		D70
Flash (COC), °F	538		D92
Penetration, 77°F, 100 GM, 5 Sec	85		D5
Ductility @ 39.2°F, CM	17		D113
Viscosity @ 140°F	984	Poises	D2171
Viscosity @ 275°F	267	Centistokes	D2170
Solubility in trichloroethylene, min. %	99.0		D 204

550 E. SOUTH TEMPLE • P.O. BOX 30825 • SALT LAKE CITY, UTAH 84130-0825

CONTECH
CONSTRUCTION PRODUCTS INC.

C-40NW

PHYSICAL PROPERTY DATA SHEET

Non-Woven Geotextile

Typical Roll Values

C-40NW is a polypropylene, staple fiber, needlepunched nonwoven geotextile.
The fibers are needled to form a stable network that retain dimensional stability relative to each other.
The geotextile is resistant to ultraviolet degradation.

PROPERTY	TEST METHOD	UNITS	VALUE
Grab Tensile Strength	ASTM D4632	lbs.	120
Grab Elongation	ASTM D4632	%	50
Puncture Strength	ASTM D4833	lbs.	80
Mullen Burst	ASTM D3786	psi	265
Trapezoidal Tear	ASTM D4533	lbs.	50
Weight	ASTM D4533	oz/yd^2	4.0
Thickness	ASTM D5199	mils	55
UV Resistance	ASTM D4355 Xenon Arc	% Retained @ 500 hrs	70
Permittivity, Ψ	ASTM D4491	sec^{-1}	2.50
Permeability	ASTM D4491	cm/sec	0.34
Water Flow Rate	ASTM D4491	gpm/ft^2	160

Roll Width (Nominal)	**Measured**	**Ft**	**12.5/15**
Roll Length (Nominal)	**Measured**	**Ft**	**360**
Roll Area (Nominal)	**Calculated**	**SY**	**500/600**

BASE REINFORCEMENT GEOGRID - BR1
(BX1100)

The geogrid shall be a regular grid structure formed by biaxially drawing a continuous sheet of select polypropylene material and shall have aperture geometry and rib and junction cross-sections sufficient to permit significant mechanical interlock with the material being reinforced. The geogrid shall have high flexural rigidity and high tensile strength at ribs and junctions of the grid structure. The geogrid shall maintain its reinforcement and interlock capabilities under repeated dynamic loads while in service and shall also be resistant to ultraviolet degradation, to damage under normal construction practices, and to all forms of biological or chemical degradation normally encountered in the material being reinforced.

The geogrid shall also conform in all respects to the property requirements listed below.

PROPERTY	TEST METHOD	UNITS	VALUE
Interlock			
• aperture size[1]	I.D. Calipered[2]		
- MD		in	1.0 (nom)
- CMD		in	1.3 (nom)
• open area	COE Method[3]	%	70 (min)
• thickness	ASTM D 1777-64		
- ribs		in	0.03 (nom)
- junctions		in	0.11 (nom)
• secant aperture stability modulus @ 20 cm-kg[4]	Grid Aperture Test University of Alaska Fairbanks[5]	cm-kg/deg	3:20
Reinforcement			
• flexural rigidity-MD	ASTM D1388-64[6]	mg-cm	250,000 (min)
-CMD			270,000 (min)
• tensile modulus-MD	GRI GG1-87[7]	lb/ft	14,000 (min)
-CMD			20,000 (min)
• junctions			
- strength-MD	GRI GG2-87[8]	lb/ft	765 (min)
-CMD			1,260 (min)
- efficiency-MD	GRI GG2-87[8]	%	90 (min)
-CMD			90 (min)
Material			
• polypropylene	ASTM D 4101 Group 1/Class 1/Grade 2	%	98 (min)
• carbon black	ASTM 4218	%	0.5 (min)
Dimensions			
• roll length		ft	164 (min)
• roll width		ft	9.8 & 13.1
• roll weight		lb	71 & 95

Notes:

1. MD dimension is along roll length. CMD dimension is across roll width.
2. Maximum inside dimension in each principal direction measured by calipers.
3. Percent open area measured without magnification by Corps of Engineers method as specified in CW 02215 Civil Works Construction Guide, November 1977.
4. Secant aperture stability modulus value listed is equal to the mean value less approximately one standard deviation.
5. Grid Aperture Stability Test developed by Dr. T. Kinney at the University of Alaska, Fairbanks.
6. ASTM D1388-64 modified to account for wide specimen testing.
7. Secant modulus at 2% elongation measured by Geosynthetic Research Institute test method GG1-87 "Geogrid Tensile Strength." No offset allowances are made in calculating secant modulus.
8. Geogrid junction strength and junction efficiency measured by Geosynthetic Research Institute test method GG2-87 "Geogrid Junction Strength."

The Tensar Corporation
1210 Citizens Parkway
Morrow, GA 30260
1-800-845-4453

To: Dave Jensen

DIAMOND VOGEL PAINTS

Diamond Vogel Paint
4500 E. 48th Ave.
Denver, Colorado 80216-3211
Phone (303) 333-4499

Mailing Address:
Diamond Vogel Paint
P.O. Box 16388
Denver, Colorado 80216-0388

Quality Lasts Longer . . .

April 8, 1996

Martin Construction
16828 ½ Road
Grand Junction, Co 81503

RE: TB-3509 and Glass Beads

To Whom It May Concern:

This letter is indicate that Diamond Vogel product TB-3509 Yellow Alkyd Traffic Paint will meet or exceed the performance requirements of FS TT-P-115E. The reflective glass beads are manufactured to AASHTO-M-247, Type 2.

Sincerely,

Russ Sammons
Customer Service Representative

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9011

File No. Supplier TRAFFIC

April 21, 1992

Mr. Hans Falkner Jensen
Flint Trading Company
P.O. Box 19147
Greensboro, North Carolina 27407

Dear Mr. Jensen:

Your "Premark" preformed thermoplastic pavement marking material has been successfully tested and used by the Colorado Department of Transportation. A Product Evaluation Form (CDOT Form #595) was submitted, and the material has been used in both Districts 1 and 6 with very good results, and is hereby approved for use in Colorado.

We have revised the specification to indicate the preformed thermoplastic can be either an alkyd thermoplastic or a hydrocarbon thermoplastic. The specification is attached for your information.

If you have any further questions, feel free to call me at (303) 757-9248.

Yours very truly,

Denis Donnelly
Staff Materials Engineer

Encl.

cc: Jud Allen
Ken Howard
John Bemelen
File

SPECIFICATION

PREFORMED THERMOPLASTIC PAVEMENT MARKINGS

1. USE: A durable, retro-reflective pavement marking material suitable for use as roadway, intersection, airport, commercial or private delineation and markings.

1.1 The markings must be a resilient white or yellow hydrocarbon thermoplastic product with uniformly distributed glass beads throughout the entire cross sectional area. Lines, legends and symbols are capable of being affixed to bituminous and/or Portland concrete pavements by the use of the normal heat of a propane torch. Other colors shall be available as required.

1.2 The markings must be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastic when heated with the torch.

1.3 The markings must be able to be applied in temperatures down to 32 degrees F. without any special storage, preheating or treatment of the material before application.

2. MATERIAL: Must be composed of hydrocarbon resin, aggregates, pigments, binders and glass beads which have been factory produced as a finished product, which is designed to meet the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. The thermoplastic material conforms to AASHTO designation M249-79 (86), with the exception of the relevant differences due to the material being supplied in a preformed state.

2.1 Graded Glass Beads:

The material must contain a minimum of thirty percent (30%) graded glass beads by weight. The beads are clear and transparent. Not more than twenty percent (20%) consists of irregular fused spheroids, or silica. The index of refraction shall not be less than 1.50.

2.2 Pigments:

White: Sufficient titanium dioxide pigment is used to ensure a color similar to Federal Highway White, Color No. 17886, as per Federal Standard 595.

Yellow: Sufficient yellow pigment is used to ensure a color similar to Federal Highway Yellow, Color No. 13655, as per Federal Standard 595. The yellow

pigment must be of an organic nature only and contain no heavy metals.

2.3 Skid Resistance: The surface must provide a minimum resistance value of 50 BPN when tested according to ASTM: E 303.

2.4 Thickness: The material must be supplied at a minimum thickness of 125 mils (3.15 mm).

2.5 Versatility: No glass beads must be applied on the surface of the material before application, as the material shall be able to be placed on the pavement either side up. For instance: Should an arrow, either left or right, be desired, only one arrow needs to be purchased. This is also true of combination arrows and other legends where applicable.

2.6 Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, oil, gasoline, salt or adverse weather conditions.

3. APPLICATION:

3.1 Asphalt: The materials shall be applied using the propane torch method recommended by the manufacturer. The material must be able to be applied at ambient and road temperatures down to 32 degrees F. without any preheating of the pavement to a specific temperature. The pavement shall be clean, dry and free of debris. Supplier must enclose application instructions with each box/package.

3.2 Portland Concrete: The same application procedure shall be used as described under Section 3.1. However, a compatible primer sealer may be applied before application to assure proper adhesion.

4. PACKAGING: The preformed thermoplastic markings shall be placed in protective plastic film with cardboard stiffeners where necessary to prevent damage in transit. Linear material must be cut to a maximum of 3' long pieces. Legends and symbols must also be supplied in flat pieces. The cartons in which packed shall be nonreturnable and shall not exceed 40" in length and 25" in width, and be labeled for ease of identification. The weight of the individual carton must not exceed seventy (70) pounds.

5. TECHNICAL SERVICES: The successful bidder shall provide technical services as required.

6. PERFORMANCE: The preformed thermoplastic markings shall be approved for use by the appropriate state agency.

SPECIFICATIONS
FOR
SS1 EMULSIONS
KOCH MATERIALS COMPANY

202 4th Avenue
Grand Junction, CO 81501
Ph. (970) 241-1135

BL # 147080 DATE: 8/08/95

TEST	SS1	SS1H	RESULTS
Viscosity, Saybolt Furol, at 77 degrees F., sec.	min & max 20-100	20-100	25
Asphalt Content-%	57	57	63.1%
24 Hour Storage Stability	1	1	1
Cement Mixing %	2.0	2.0	2.0
Residue Penetration at 77 degrees F.	100-200	40-90	112

CERTIFICATE OF COMPLIANCE

This certifies that the above named articles are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation.

Signed Clint C. Mustoe

PEEL FILM HE

DowElanco™

Surflan* A.S.

A selective preemergence surface-applied herbicide for control of annual grasses and many broadleaf weeds in:

- Landscape ornamentals
- Container grown ornamentals
- Field grown ornamentals
- Drainage areas under greenhouse benches
- Ornamental bulbs
- Ground covers
- Christmas tree plantations
- Noncropland
- Non-bearing trees and vines
- Industrial sites
- Established warm season turf (including Bahiagrass, Bermudagrass, Buffalograss, Centipedegrass, St. Augustinegrass, Tall Fescue and Zoysiagrass)

Active Ingredient:

oryzalin: 3,5-dinitro-N4,N4-dipropylsulfanilamide	40.4 [illegible]
Inert Ingredients	[illegible]
Total	[illegible]

Contains 4.0 pounds of active ingredient per gallon.

Keep Out of Reach of Children

CAUTION

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

Refer to inside of label booklet for additional precautionary information including Personal Protective Equipment (PPE), and Directions for Use including Storage and Disposal.

Shake Well Before Using.

Notice: Read the entire label. Use only according to label directions. Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.

In case of emergency endangering health or the environment involving this product, call collect 517-636-4400.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-[illegible] EPA Est. [illegible]

20122 [illegible]

*Trademark of DowElanco

DowElanco • Indianapolis, IN 46268, U.S.A.

Specialty Herbicide Net Contents **2.5 gal**

manufacturer's instructions for cleaning/ ing PPE. If no such instructions for es, use detergent and hot water. Keep PPE separately from other laundry.

ser Safety Recommendations

- ...ht
- ...nds before eating, drinking, chewing ...g tobacco or using the toilet.
- ...clothing immediately if pesticide gets ... wash thoroughly and put on clean ...

irst Aid

- ...yes: ...h with plenty of water. Get medical ... irritation develops.
- ...kin: Wash with plenty of soap and water. ... attention if irritation develops.
- ...llowed: Do not induce vomiting. Call a ... Poison Control Center. If available, ... activated charcoal (6-8 heaping ...) with a large quantity of water. Do not ... by mouth to an unconscious person. ... transport to a medical care facility and ...
- ...ed: Remove individual to fresh air. Get ... if breathing difficulty occurs. If ... give artificial respiration, preferably ... resuscitation and get medical ... immediately.

nvironmental Hazards

- ... directly to water, to areas where ... is present or to intertidal areas below ... water mark. Do not contaminate ... disposing of equipment washwaters ... cover or incorporate spills.

rections for Use

- ... of Federal law to use this product in a ... with its labeling.
- ... Directions for Use carefully before applying.
- ... this product in a way that will contact ... persons, either directly or through ... protected handlers may be in the area ... For any requirements specific to ... consult the agency responsible for ... application.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about Personal Protective Equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks
- Protective eyewear

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal.

Storage: Store in original container only. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

General Information

Surflan A.S. herbicide is a preemergence surface-applied herbicide for the control of annual grasses and many broadleaf weeds in ornamental plantings, bulbs, ground covers, established warm-season turfgrass, Christmas tree plantations, non-bearing trees and vines, non-cropland and industrial sites.

Shake Well Before Using.

General Use Precautions

Surflan A.S. will not control emerged weeds. Poor weed control may result if directions are not followed. Over-application may result in crop injury or excessive soil residue.

Surflan A.S. is orange in color and may cause temporary discoloration of sprayed surfaces. If this discoloration is undesirable, it may be altered by using a commercially available colorant such as Blazon or removed by spraying surface with water or washing with an industrial cleaner immediately after application. Surflan A.S. may also be applied with mulch colorants, such as Mulch Magic or Nu-Mulch.

Users who wish to use Surflan A.S. on plant species not recommended on this label may determine the suitability for such uses by treating a small number of such plants at a recommended rate. Prior to treatment of larger areas, the treated plants should be observed for any sign of herbicidal injury for 30 to 60 days to determine if the treatment is non-injurious to the target plant species. The user assumes responsibility for any plant damage or other liability resulting from use of Surflan A.S. on plant species not recommended on this label.

Chemigation: Do not apply this product through any type of irrigation system.

Soil Preparation

Surflan A.S. will not control emerged weeds. Therefore, areas to be treated should be free of emerged weeds. Weed residues, prunings and trash should be thoroughly mixed into the soil or removed prior to treatment. In field applications, the soil should be in good tilth and free of clods at the time of application.

Mixing Directions

Surflan A.S. Alone

Make sure spray tank is clean and use only clean water. Fill spray tank ½ to ¾ full. Start agitation and add the required amount of Surflan A.S. Continue agitation and finish filling the spray tank. Maintain continuous agitation until application is completed.

Surflan A.S. Tank Mix Combinations

Prior to mixing, read and carefully follow all label instructions and precautions for each product added to the tank mixture. Vigorous, continuous agitation is required for all Surflan A.S. tank mixes. Sparger pipe agitators generally provide the best agitation in spray tanks.

Precaution: Do not allow the spray mixture to siphon back into the water source.

Mixing Order: Fill the tank ¾ full with clean water. Start agitation and add different formulation types in the order indicated below, allowing time for complete mixing and dispersion after addition of each product. Allow extra mixing and dispersion time for dry flowable products.

Add different formulation types in the following order: dry flowables (DF); wettable powders (WP); Surflan A.S. and other aqueous suspensions (AS). flowables (F) and liquids (L); solutions (S); and emulsifiable concentrates (EC).

Continue agitation and finish filling the spray tank with clean water. Maintain agitation until application is completed. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be completely resuspended before spraying is continued. A sparger agitator is particularly useful for this purpose.

Premixing: When tank mixing, initial mixing and dispersion of certain dry flowable or wettable powder products may be improved by premixing with water (slurrying). Adding the slurried mater al to the spray tank through a 20 or 35 mesh wetting screen will help assure good initial dispersion. Line screens in the tank should be no finer than 50 mesh (100 mesh is finer than 50 mesh).

Application Methods

Ground Application

Apply Surflan A.S. as a directed spray to the soil surface or over top of plants using a vehicle-mounted, pull-type, or backpack sprayer. Apply the appropriate rate of Surflan A.S. as outlined in "Approved Uses" section of this label. In all cases, use sufficient water volume to obtain uniform coverage and deliver the desired rate of Surflan A.S. to the treated area. The volume of water used is not critical, as long as the desired rate of Surflan A.S. is delivered uniformly across the area treated. When calibrating, determine the volume of water delivered by the sprayer to a given area (1,000 sq ft, acre, etc.). Then mix the desired rate of Surflan A.S. in the amount of water required to cover the entire area to be treated. Use only a properly calibrated, low-pressure herbicide sprayer that will apply the spray uniformly. Use herbicide tips with screens no finer than 50 mesh in nozzles and in-line strainers. As the amount of water used (spray volume) decreases, the importance of accurate calibration and uniform application increases. Check the sprayer daily to ensure proper calibration and uniform application. Maintain continuous agitation from mixing through application. Avoid spray pattern skips and overlaps that may result in incomplete coverage or over-application.

Aerial Application

Use a standard aerial herbicide boom sprayer. Aerial spray equipment should be calibrated to apply the proper amount of Surflan A.S. alone or in tank mix combinations in 2 to 10 gallons of spray mixture per acre. Nozzle screens and in-line strainers should be no finer than 50 mesh. Surflan A.S. mixes readily with water for concentrate aerial sprays; however, constant vigorous agitation that sweeps the contents from the bottom of the spray tank up into the main body of the liquid is required to maintain a uniform suspension until the spray tank is empty. Avoid spray pattern skips and overlaps that may result in incomplete coverage or over-application. Do not apply when wind conditions favor drift from the target area.

Equipment Cleaning

If a buildup of material occurs on the walls of the spray tank, it should be removed between fillings by washing with soap and water and rinsing thoroughly. Tanks, lines, screens and nozzles should be cleaned thoroughly after each use.

Activation and Cultivation

Surflan A.S. will remain stable on the soil surface up to 21 days following application. In the absence of timely rainfall, irrigation can be used to activate Surflan A.S. A minimum of one-half (½) inch of rain or its equivalent in sprinkler irrigation is necessary to activate Surflan A.S. If weeds begin to emerge due to lack of rainfall or irrigation, shallow cultivate 1 to 2 inches deep to destroy existing weeds or remove them by hand. Shallow cultivation to a depth of 1 to 2 inches will enhance herbicidal effectiveness. If Surflan A.S. is not activated by rainfall, irrigation or cultivation within 21 days of application or existing weeds have not been removed, erratic weed control may result.

Weeds Controlled by Surflan A.S.

Annual Grasses:

Common Name	Scientific Name
barley, little	*Hordeum pusillum*
barnyardgrass (watergrass)	*Echinochloa crus-galli*
bluegrass, annual	*Poa annua*
crabgrass, large	*Digitaria sanguinalis*
crabgrass, smooth	*Digitaria ischaemum*
crowfootgrass	*Dactyloctenium aegyptium*
cupgrass, southwestern	*Eriochloa gracilis*
foxtail, bristlegrass	*Setaria magna*
foxtail, giant	*Setaria faberi*
foxtail, green (pigeongrass)	*Setaria viridis*
foxtail, robust	*Setaria robusta*
foxtail, yellow	*Setaria glauca*
goosegrass (silver crabgrass)	*Eleusine indica*
Johnsongrass (seedling only)	*Sorghum halepense*
junglerice	*Echinochloa colonum*
lovegrass, Mexican	*Eragrostis mexicana*
lovegrass, orcutt	*Eragrostis orcuttiana*
oat, wild	*Avena fatua*
panicum, browntop	*Panicum fasciculatum*
panicum, fall (spreading panicgrass)	*Panicum dichotomiflorum*
panicum, Texas (buffalograss) (Coloradograss)	*Panicum texanum*
ryegrass, Italian	*Lolium multiflorum*
sandbur, field	*Cenchrus incertus*
signalgrass (Brachiaria)	*Brachiaria* spp.
sprangletop, red	*Leptochloa filiformis*
witchgrass	*Panicum capillare*

Broadleaf Weeds:

Common Name	Scientific Name
bittercress	*Cardamine oligosperma*
carpetweed	*Mollugo verticillata*
chickweed, common	*Stellaria media*
fiddleneck, coast	*Amsinckia intermedia*
filaree, redstem	*Erodium cicutarium*
filaree, whitestem	*Erodium moschatum*
groundsel, common	*Senecio vulgaris*
henbit	*Lamium amplexicaule*
knotweed, prostrate	*Polygonum aviculare*
lambsquarters	*Chenopodium album*
pigweed, prostrate	*Amaranthus blitoides*
pigweed, redroot	*Amaranthus retroflexus*
pigweed, spring	*Amaranthus hybridus*
pigweed, tumble	*Amaranthus albus*
puncturevine	*Tribulus terrestris*
purslane, common	*Portulaca oleracea*
pusley, Florida (Florida purslane) (Mexican clover) (pusley)	*Richardia scabra*
rocket, London	*Sisymbrium irio*
rockpurslane, desert	*Calandrinia ciliata*
shepherdspurse	*Capsella bursa-pastoris*
spurge, prostrate	*Euphorbia humistrata*
woodsorrel, yellow	*Oxalis stricta*

Weeds Suppressed by Surflan A.S.

Control of the following weeds may be erratic, ranging from poor to excellent, depending upon soil temperature, time of germination, depth of seed in the soil, and amount and timing of soil moisture:

Common Name	Scientific Name
horseweed	*Conyza canadensis*
ladysthumb	*Polygonum persicaria*
lettuce, prickly	*Lactuca serriola*
mallow, common	*Malva neglecta*
milkweed, climbing	*Sarcostemma cynanchoides*
morningglory	*Ipomoea* spp.
mustard, black	*Brassica nigra*
mustard, wild	*Brassica kaber*
nightshade, black	*Solanum nigrum*
ragweed, common	*Ambrosia artemisiifolia*
smartweed	*Polygonum pensylvanicum*
sowthistle, annual	*Sonchus oleraceus*
spurge, spotted	*Euphorbia maculata*
teaweed (prickly sida)	*Sida spinosa*
velvetleaf	*Abutilon theophrasti*
wheat, volunteer	*Triticum* spp.

Approved Uses

Ornamental Plantings

Special Use Precautions:

Apply only to established plantings. Established plants are defined as those that have been transplanted into their growing location for a sufficient period of time to allow the soil to be firmly settled around the roots from packing and rainfall or irrigation.

To avoid possible injury, do not apply Surflan A.S. to:

- Either nursery seedbeds or forest or Christmas tree seedling transplant beds.
- Unrooted liners or cuttings that have been planted in pots for the first time.
- Pots less than four inches wide.
- Ground covers until they are established and well rooted.
- Ornamental plantings where there is likelihood of runoff onto lawn areas.
- Areas containing dichondra or cool season turfgrass species.

Rooted liners should be removed from their original growing containers and placed in new containers at least two weeks prior to treatment or injury may occur.

On container grown ornamentals where weed seed germination continues for extended periods of time, do not make repeat applications of Surflan A.S. for at least 90 days or crop injury may occur.

For soils treated with Surflan A.S. during the previous season, plant only the ornamental species listed on this label or injury may occur.

Ice Plant: When establishing unrooted ice plant (*Mesembryanthemum crystallinum* and *Carpobrutus edulis*) on coarse soils in landscape plantings, use only the 2 quart per acre rate of Surflan A.S. or crop injury may occur. After the ice plant is well established, a second application may be made.

Broadcast Application Rates

	Surflan A.S.	
Length of Control	quarts/acre	fl oz/1000 sq ft
2 to 4 months	2	1.5
4 to 8 months	4	3

Handheld or Backpack Sprayer Application

Apply Surflan A.S. at a rate of 1.5 to 3 ounces per 1000 square feet. The amount of water used to apply Surflan A.S. is not critical, but should be sufficient for uniform treatment of the target area. Calibrate by determining the volume of water required to treat 1000 square feet. Use this calibration volume to determine the amount of water and Surflan A.S. needed to treat the target area (see following table). **Note:** Sprayer calibration (volume of spray needed to treat 1,000 square feet) will vary with each individual operator.

Length of Control	Application Rate (fl oz/1000 sq ft)	Quantity of Water Needed
2 to 4 months	1.5	The amount required by your sprayer to cover 1000 sq ft of area
4 to 8 months	3.0	

Sample Calculation:
Size of target area ÷ 1000 x Application rate = Amount of Surflan A.S. required
Size of target area ÷ 1000 x Calibration volume per 1000 sq ft = Amount of water required

Recommended Species Including Fruit Plant Nursery Liners

Surflan A.S. is recommended for use on certain container- and field-grown established ornamental plants, trees and shrubs; established ground covers; field grown fruit tree and shrub nursery liners; and in the production of ornamental bulbs (See "Ornamental Bulbs" for special use directions).

Do not apply Surflan A.S. to the following plant species when container grown or field grown or injury may occur:
Deutzia gracilis (slender deutzia)
Pseudotsuga menziesii (Douglas-fir)
Thuja occidentalis 'Techny' (Techny arborvitae)
Tsuga canadensis (eastern hemlock)

Surflan A.S. May be Used on the Following Field- and Liner† - Grown Plants and Plants in Landscape Plantings:

†Plants transplanted for additional growth before transplanting to final growing location.

Common Name	Scientific Name
abelia, glossy	*Abelia grandiflora*
acacia, prostrate	*Acacia redolens*
agave	*Agave macroculmis*
Andromeda	*Pieris japonica*
apple	*Malus* spp.
arborvitae, American	*Thuja occidentalis*
arborvitae, Oriental	*Platycladus orientalis*
ash	*Fraxinus* spp.
aster, stokes	*Stokesia laevis*
astilbe/false spirea	*Astilbe chinensis* and *A. chinensis* hybrids
azalea	*Rhododendron* spp.
baby's breath	*Gypsophila paniculata*
barberry, Japanese	*Berberis thunbergii*
bellflower	*Campanula elatines*
birch, river	*Betula nigra*
birch, white	*Betula pendula*
bird of paradise	*Strelitzia reginae*
blazing star	*Liatris spicata*
bleeding heart	*Dicentra spectabilis*
bottlebrush, lemon	*Callistemon citrinus*
boxwood, common	*Buxus sempervirens*
boxwood, Japanese	*Buxus microphylla japonica*
brush cherry	*Syzygium paniculata*
caldaium, fancy leafed	*Caladium bicolor*
California laurel	*Umbellularia californica*

Common Name	Scientific Name
campanula (bellflower)	*Campanula* spp.
cape marigold	*Dimorphotheca* spp.
carpet bugle	*Ajuga* spp.
cassia, feathery	*Cassia artemisioides*
cherry, Mahaleb	*Prunus mahaleb*
cherry, sweet	*Prunus avium*
chrysanthemum, florists	*Chrysanthemum morifolium*
cleyera, Japanese	*Cleyera japonica*
coneflower, purple	*Echinacea purpurea*
coreopsis	*Coreopsis lanceolata*
cotoneaster, bearberry	*Cotoneaster dammeri*
cotoneaster, brightbead	*Cotoneaster buxifolius*
cotoneaster, cranberry	*Cotoneaster apiculatus*
cotoneaster, parney	*Cotoneaster lacteus*
cotoneaster, Pyrenees	*Cotoneaster congestus*
cotoneaster, rock	*Cotoneaster horizontalis*
cotoneaster, rockspray	*Cotoneaster microphyllus*
cottonwood (grown for pulp)	*Populus deltoides*
coyotebush, dwarf	*Baccharis pilularis*
crape Myrtle, common	*Lagerstroemia indica*
cryptomeria, Japanese	*Cryptomeria japonica*
cypress, Arizona	*Cupressus arizonica (glabra)*
cypress, Italian	*Cupressus sempervirens*
daisy, gloriosa (black-eyed Susan)	*Rudbeckia hirta*
daisy, painted	*Chrysanthemum coccineum*
daisy, shasta	*Chrysanthemum maximum*
daisy, trailing African	*Osteospermum fruticosum*
daylily	*Hemerocallis* spp.
dogwood, flowering	*Cornus florida*
dogwood, kousa	*Cornus kousa*
eastercactus	*Rhipsalidopsis gaertneri*
escallonia	*Escallonia exoniensis*
eucalyptus, mealy	*Eucalyptus cinerea*
eucalyptus, narrow-leaved	*Eucalyptus nicholii*
eucalyptus, red	*Eucalyptus sideroxylon*
euonymus, evergreen	*Euonymus japonica*
euonymus, stringybark	*Euonymus fortunei*
euonymus, winged	*Euonymus alata*
falsecypress, Lawson	*Chamaecyparis lawsoniana*
fatshedera	*Fatshedera lizei*
fir, alpine	*Abies lasiocarpa*
fir, balsam	*Abies balsamea*
fir, fraser	*Abies fraseri*
fir, grand	*Abies grandis*
fir, Veitch	*Abies veitchi*
fir, white	*Abies concolor*
firethorn	*Pyracantha, fortuneana*
firethorn, formosa	*Pyracantha skoioc*
firethorn, scarlet	*Pyracantha coccii*
forsythia, border	*Forsythia intermec*
gardenia	*Gardenia jasminoi*
gazania, trailing	*Gazania rigens leucolaena*
geranium (Pelargonium)	*Pelargonium hortc*
geum	*Geum quelhyon*
ginkgo	*Ginkgo biloba*
garden gladiolus	*Gladiolus hortulan*
goldenrain tree	*Koelreuteria paniculata*
heavenly bamboo (Nandina)	*Nandina domestic*
hibiscus, Chinese	*Hibiscus rosa-sine*
holly, Chinese	*Ilex cornuta*
holly, English	*Ilex aquifolium*
holly, Japanese	*Ilex crenata*
honeysuckle, Japanese	*Lonicera japonica*
honeysuckle, Mexican	*Justicia spicigera*
hopseedbush, dammy	*Dodonaea viscosa*
ice plant	*Mesembryanthem crystallinum*
(See precautions for ornamental plantings)	
ice plant, largeleaf	*Carpobrutus edul*
(See precautions for ornamental plantings)	
impatiens (Busy lizzie)	*Impatiens wallera*
iris, bearded	*Iris* spp.
ivy, Algerian	*Hedera canariensi*
ivy, English	*Hedera helix*
Jerseytea, redroot	*Ceanothus americanus*
juniper	*Juniperus* spp.
kumquat	*Fortunella* spp.
laurel, mountain	*Kalmia latifolia*
laurelcherry, Carolina	*Prunus caroliniana*
laurelcherry, English	*Prunus lauroceras*
leucothoe, coast	*Leucothoe axillaris*

Common Name	Scientific Name
leucothoe, drooping	*Leucothoe fontanesiana*
lilac, common	*Syringa vulgaris*
lily, plantain	*Hosta* spp.
lilyturf, bigblue	*Liriope muscari*
lily-of-the-Nile	*Agapanthus africanus*
linden, little leaf	*Tilia cordata*
magnolia, Southern	*Magnolia grandiflora*
manzanita, Stanford	*Arctostaphylos stanfordiana*
maple	*Acer* spp.
marigold	*Tagetes* spp.
mockorange	*Philadelphus* spp.
moss, rose	*Portulaca grandiflora*
myoporum, prostrate	*Myoporum parvifolium*
myrtle, true	*Myrtus communis*
oak	*Quercus* spp.
oleander	*Nerium oleander*
orange, ornamental	*Citrus* spp.
Oregon grape	*Mahonia aquifolium*
osmanthus, holly-leaf	*Osmanthus heterophyllus*
Palo Verde, blue	*Cercidium floridum*
pansy	*Viola wittrockiana*
pear	*Pyrus communis*
pecan, ornamental	*Carya* spp.
periwinkle, bigleaf	*Vinca major*
periwinkle, dwarf	*Vinca minor*
petunia	*Petunia* spp.
photinia	*Photinia fraseri*
pine	*Pinus* spp.
pittosporum	*Pittosporum* spp.
privet, amur	*Ligustrum amurense*
privet, glossy	*Ligustrum lucidum*
privet, golden	*Ligustrum vicaryi*
privet, Japanese	*Ligustrum japonicum*
protea	*Protea neriifolia*
ranunculus, Persian	*Ranunculus asiaticus*
redbud	*Cercis canadensis*
redcedar, eastern	*Juniperus virginiana*
redcedar, western	*Thuja plicata*
redwood, coast	*Sequoia sempervirens*
rhaphiolepsis (India hawthorn)	*Rhaphiolepsis indica*
rhododendron	*Rhododendron* spp.
rose	*Rosa* spp.
rose-of-Sharon	*Hibiscus syriacus*
Russian olive	*Elaeagnus angustifolia*
sage	*Salvia* spp.
shrimp plant	*Justicia brandegeana*
snapdragon	*Antirrhinum majus*
sotol, desert spoon	*Dasylirion wheeleri*
spruce, black	*Picea mariana*
spruce, Colorado	*Picea pungens*
spruce, Englemann	*Picea englemanni*
spruce, Norway	*Picea abies*
spruce, white	*Picea glauca*
star jasmine, Chinese	*Trachelospermum jasminoides*
stonecrop	*Sedum brevifolium*
sumac, African	*Rhus lancea*
sweetgum, American	*Liquidambar styraciflua*
sweet William	*Dianthus barbatus*
tobira	*Pittosporum tobira*
trumpet vine, violet	*Clytostoma callistegioides*
viburnum, Laurustinus	*Viburnum tinus*
virburnum, Sandankwa	*Virburnum suspensum*
weigela, oldfashioned	*Weigela florida*
wintercreeper	*Euonymus fortunei*
xylosma, Japanese	*Xylosma congestum*
yarrow	*Achillea* spp.
yaupon	*Ilex vomitoria*
yew	*Taxus media*
yew, Japanese	*Taxus cuspidata*
yewpine	*Podocarpus macrophyllus*
yucca, pendulous	*Yucca recurvifolia*
yucca, soaptree	*Yucca elata*
zinnia, common	*Zinnea elegans*

Surflan A.S. May be Used on the Following Container-Grown Plants:

Common Name	Scientific Name
andromeda	*Pieris japonica*
arborvitae, American	*Thuja occidentalis*
arborvitae, Oriental	*Platycladus orientalis*
astilbe/false spirea	*Astilbe chinensis* and *A. chinensis* hybrids
barberry, Japanese	*Berberis thunbergii*
bellflower	*Campanula elatines*
blazing star	*Liatris spicata*
bleeding heart	*Dicentra spectabilis*
bottlebrush, lemon	*Callistemon citrinus*
boxwood, common	*Buxus sempervirens*
brush cherry	*Syzygium paniculata*
cleyera, Japanese	*Cleyera japonica*
cotoneaster, bearberry	*Cotoneaster dammeri*
cotoneaster, cranberry	*Cotoneaster apiculatus*
cotoneaster, parney	*Cotoneaster lacteus*

Common Name	Scientific Name
cotoneaster, rock	*Cotoneaster horizontalis*
crape Myrtle, common	*Lagerstroemia indica*
cryptomeria, Japanese	*Cryptomeria japonica*
cypress, Arizona	*Cupressus arizonica (glabra)*
cypress, Italian	*Cupressus sempervirens*
daylily	*Hemerocallis* spp.
dogwood, kousa	*Cornus kousa*
eastercactus	*Rhipsalidopsis gaertneri*
escallonia	*Escallonia exoniensis*
euonymus, evergreen	*Euonymus japonica*
euonymus, stringybark	*Euonymus fortunei*
fatshedera	*Fatshedera lizei*
firethorn	*Pyracantha, fortuneana*
firethorn, formosa	*Pyracantha skoidzumi*
firethorn, scarlet	*Pyracantha coccinea*
gardenia	*Gardenia jasminoides*
ginkgo	*Ginkgo biloba*
holly, Chinese	*Ilex cornuta*
holly, Japanese	*Ilex crenata*
Jerseytea, redroot	*Ceanothus americanus*
juniper	*Juniperus* spp.
kumquat	*Fortunella* spp.
lilac, common	*Syringa vulgaris*
lilyturf, bigblue	*Liriope muscari*
lily-of-the-Nile	*Agapanthus africanus*
linden, little leaf	*Tilia cordata*
mockorange	*Philadelphus* spp.
myrtle, true	*Myrtus communis*
oak	*Quercus* spp.
oleander	*Nerium oleander*
orange, ornamental	*Citrus* spp.
pecan, ornamental	*Carya* spp.
photinia	*Photinia fraseri*
pine	*Pinus* spp.
pittosporum	*Pittosporum* spp.
privet, amur	*Ligustrum amurense*
privet, glossy	*Ligustrum lucidum*
privet, golden	*Ligustrum vicaryi*
privet, Japanese	*Ligustrum japonicum*
redbud	*Cercis canadensis*
rhaphiolepsis (India hawthorn)	*Rhaphiolepsis indica*
rhododendron	*Rhododendron* spp.
Russian olive	*Elaeagnus angustifolia*
shrimp plant	*Justicia brandegeana*
spruce, Colorado	*Picea pungens*
sumac, African	*Rhus lancea*
sweetgum, American	*Liquidambar styraciflua*
trumpet vine, violet	*Clytostoma callistegioides*
viburnum, Laurustinus	*Viburnum tinus*
wintercreeper	*Euonymus fortunei*
yaupon	*Ilex vomitoria*
yucca, soaptree	*Yucca elata*

Surflan A.S. May be Used on the Following Field Grown Fruit Plant Nursery Liners†:

almond	grapefruit	pear
apple	kiwi	pecan
apricot	lemon	pistachio
avacado	macadamia nut	plum
cherry	nectarine	pomegranate
fig	olive	prune
filbert	orange	walnut, English
grape		

Small Fruits:

blackberry	currant	gooseberry
blueberry	dewberry	loganberry
boysenberry	elderberry	raspberry

†Plants transplanted for additional growth before transplanting to final growing location.

Tank Mix Combinations

Tank mix combinations of Surflan A.S. plus Roundup, and many other labeled herbicides may be used to control undesirable vegetation in ornamental areas. Surflan A.S. may also be tank mixed with Gallery® herbicide (California registration pending) and applied preemergence to broaden the spectrum of broadleaf weed control in ornamental areas. Applied as directed, these Surflan A.S. tank mixes will provide control of susceptible weed species listed on the respective labels. Refer to tank mix product labels for specific use directions, precautions and limitations before use.

Surflan A.S. Plus Roundup: Tank mix combinations of Surflan A.S. plus Roundup are recommended to control existing undesirable vegetation. Applied as directed, Surflan A.S. plus Roundup will provide postemergence control of susceptible weed species listed on the label for Roundup and residual preemergence control of susceptible weed species listed on the label for Surflan A.S. Refer to the label for Roundup for specific use directions, precautions and limitations before use.

Precautions:
Do not apply sprays containing Roundup over the top of ornamental plants.
Extreme care must be exercised to prevent contact of sprays containing Roundup with foliage and stems of turfgrasses, trees, shrubs, or other desirable vegetation since severe damage or death may result. **Note:** If spraying with Roundup in areas adjacent to desirable plants, use a shield to prevent spray from contacting foliage and stems of desirable plants.

Ornamental Bulbs

Surflan A.S. may be applied for control of susceptible annual weeds in ornamental bulbs, e.g., bulbous iris, daffodil (narcissus), hyacinth and tulip. Apply Surflan A.S. to the soil surface 2 to 4 weeks after planting, but prior to the emergence of annual weeds. For fall planted bulbs, apply Surflan A.S. again in late winter or early spring to weed-free soil surfaces.

Special Use Precautions:
Do not apply to tulip plants that have emerged to a height greater than 3/4 inch.
Do not apply to gladioli corms prior to emergence or less than one inch in diameter.

Broadcast Application Rates

		Surflan A.S.	
Time of Application	Soil Texture	quarts/ acre	fl oz/ 1000 sq ft
Fall	Coarse	0.75	0.5
Fall	Medium and Fine	1.5	1.0
Feb. - March	All Soil Textures	0.75	0.5

Greenhouse Areas

Surflan A.S. may be applied to drainage areas under benches in open greenhouse-type structures. Do not apply in enclosed greenhouses or in enclosed shadehouse-type structures. Do not apply within three weeks prior to enclosure in greenhouse-type structures.

Christmas Tree Plantations

Surflan A.S. Alone
Apply Surflan A.S. as a directed spray to the soil surface or as an overtop spray to established plantings of field grown Christmas tree species, including fir (*Abies* spp.), pine (*Pinus* spp.), and spruce (*Picea* spp.). Do not apply to Douglas-fir (*Pseudotsuga menziesii*). Do not apply to seedbeds or seedling transplant beds. Apply only to established plantings. Established plants are defined as those that have been transplanted into their final growing location for a sufficient period of time to allow the soil to be firmly settled around the roots from packing and rainfall or irrigation. Follow all instructions provided in the "General Information" section of this label.

Broadcast Application Rates

	Surflan A.S.	
Length of Control	quarts/acre	fl oz/1000 sq ft
2 to 4 months	2	1.5
4 to 8 months	4	3

Tank Mix Combinations
Tank mix combinations of Surflan A.S. plus other labeled herbicides may be used as directed or overtop sprays in established Christmas tree plantings. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to tank mix product labels for specific use directions, precautions and limitations before use.

Surflan A.S. Plus Roundup: Apply tank mix combinations of Surflan A.S. plus Roundup only as directed sprays in Christmas tree plantings. When applied according to use directions, Surflan A.S. plus Roundup will provide postemergence control of susceptible weed species listed on the Roundup label and residual preemergence control of susceptible weed species listed on the Surflan A.S. label. Refer to the Roundup label for specific use directions, precautions and limitations before use.

Precautions:
Do not apply sprays containing Roundup over the top of Christmas tree plantings.
Extreme care must be exercised to avoid contact of spray containing Roundup with foliage and stems of Christmas trees or severe damage or death may result.

Noncropland Areas and Industrial Sites

Noncropland Areas — Tank Mix Combinations
Tank mix combinations of Surflan A.S. plus Roundup and many other labeled herbicides may be used to control undesirable vegetation in noncropland areas. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to tank mix product labels for specific use directions, precautions and limitations before use.

	Surflan A.S.	
Length of Control	quarts/acre	fl oz/1000 sq ft
2 to 4 months	2	1.5
4 to 8 months	4	3
8 to 12 months	6	4.5

Industrial Sites — Tank Mix Combinations
Tank mix combinations of Surflan A.S. plus Roundup, Spike and many other labeled herbicides may be used as overtop sprays to control existing vegetation on industrial sites such as utility substations, highway guard rails, sign posts and delineators. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to tank mix product labels for specific use directions, precautions and limitation before use.

Warm Season Turfgrasses

Surflan A.S. may be applied as a preemergence treatment for control of annual grasses and certain broadleaf weeds in established warm season turf including bahiagrass, bermudagrass, buffalograss, centipedegrass, St. Augustinegrass and zoysiagrass or established tall fescue growing in warm season areas. Established turf is defined as a dense turf having a well-anchored root system and healthy, vigorous top growth. Surflan A.S. may be tank mixed with Gallery herbicide (California registration pending) and applied preemergence to broaden the spectrum of broadleaf weed control in warm season turf. Refer to the Gallery label for specific use directions, precautions, and limitations before use.

Successful preemergence control of weeds listed on this label requires that Surflan A.S. be applied prior to weed germination and be activated by at least one-half (1/2) inch of rainfall or irrigation within 21 days of application.

Special Use Precautions:
To avoid possible injury, do not apply Surflan A.S. to
- Cool season turfgrass species.
- Golf course putting greens or tees or lawns containing dichondra or cool season turfgrass species.
- Newly sprigged or sodded areas of bermudagrass, St. Augustinegrass, centipedegrass, or zoysiagrass until these turfs are well-established and have well-anchored root systems.
- Newly hydromulched areas of bermudagrass until such areas are well-established.
- Bermudagrass variety "Sun Turf" when tank mixed with atrazine.

Surflan A.S. will not control emerged weeds.

Any cultural practices that disturb the soil, such as aerification or verticutting, should be done prior to application of Surflan A.S.

Surflan A.S. may injure turf that is not well-established or is stressed or weakened due to unfavorable winter climatic conditions, drought, nematodes, or other factors which damage or weaken turf root systems. Apply Surflan A.S. only to healthy, well-established turf that has a well-anchored root system.

Use Surflan A.S. only as a part of a total turf management program that includes good fertilization practices.

Do not apply Surflan A.S. in the spring or early summer to tall fescue turfgrass reseeded the previous fall. In such cases, apply Balan® 2.5G granular herbicide at 60 to 80 pounds per acre in early summer (Round 1) and Surflan A.S. at 1.5 quarts per acre approximately eight weeks later (Round 2). Do not apply Surflan A.S. at the single application rate (2 quarts per acre) to established tall fescue; in such cases, apply 1.5 quarts per acre of Surflan A.S. in an initial application, followed by a second application of 1.5 quarts per acre 8 to 10 weeks later.

In bermudagrass areas that have been overseeded with winter grasses, a spring application of Surflan A.S. will thin the overseeded grasses.

Annual Grasses Controlled by Surflan A.S.

Summer Annuals:

Common Name	Scientific Name
barnyardgrass (watergrass)	*Echinochloa crus-galli*
crabgrass, large	*Digitaria sanguinalis*
crabgrass, smooth	*Digitaria ischaemum*
crabgrass	*Digitaria* spp.
crowfootgrass	*Dactyloctenium aegyptium*
foxtail, bristlegrass	*Setaria magna*
foxtail, giant	*Setaria faberi*
foxtail, green (pigeongrass)	*Setaria viridis*
foxtail, robust	*Setaria robusta*
foxtail, yellow	*Setaria glauca*
goosegrass (silver crabgrass)	*Eleusine indica*
Johnsongrass (seedling only)	*Sorghum halepense*
ryegrass, Italian	*Lolium multiflorum*
sandbur, field	*Cenchrus incertus*

Winter Annuals:

Common Name	Scientific Name
bluegrass, annual	*Poa annua*

Annual Broadleaf Weeds Controlled by Surflan A.S.

Summer Annuals:

Common Name	Scientific Name
carpetweed	*Mollugo verticillata*
knotweed, prostrate	*Polygonum aviculare*
purslane, common	*Portulaca oleracea*

Winter Annuals:

Common Name	Scientific Name
chickweed, common	*Stellaria media*
henbit	*Lamium amplexicaule*

Broadleaf Weeds Suppressed by Surflan A.S.

Common Name	Scientific Name
groundsel, common	*Senecio vulgaris*
spurge, prostrate	*Euphorbia humistrata*
woodsorrel, yellow	*Oxalis stricta*

Application Rates, Frequency and Timing of Application

Surflan A.S. can be applied in the spring for summer annual grass and broadleaf weed control, and in the fall for annual bluegrass (*Poa annua*) and winter annual broadleaf weed control.

1. Summer Annual Grasses and Broadleaf Weeds

Single Application Program: Apply 2 quarts per acre of Surflan A.S. per acre in late winter or early spring, prior to the onset of conditions favorable for annual weed germination.

Split Application Program: As an alternative to a single application program, Surflan A.S. may be applied in a split application. This program is desirable when the initial application is made well in advance of weed germination and where weed control is desired for a longer period of time. Apply 1.5 quarts per acre of Surflan A.S. in an initial application, followed by a second application of 1.5 quarts per acre 8 to 10 weeks later.

The second treatment of the split application may follow application of a different

2. Annual Bluegrass (*Poa annua*) and Winter Annual Broadleaf Weeds

In areas of heavy annual bluegrass infestation, its elimination will result in temporary thinning of turfgrass cover. Proper fertilization, irrigation and soil incorporated reseeding should be employed to speed the restoration of desirable turfgrass cover in areas previously occupied by annual bluegrass (See section on reseeding).

Apply Surflan A.S. as a preemergence treatment in late summer or early fall, prior to the expected germination period for annual bluegrass and winter annual broadleaf weeds. If annual bluegrass infestation is severe and its elimination will result in thinning of turfgrass cover, apply Surflan A.S. at 1.5 quarts per acre. If thinning of turfgrass cover is not a potential problem, Surflan A.S. may be applied at 2 quarts per acre.

Broadcast Application Rates

Surflan A.S.	
quarts/acre	fl oz/1000 sq ft
1.5	1
2	1.5

Weed Control in Florida

In Florida, apply 1.5 quarts per acre of Surflan A.S. three times per year, or every 90 to 100 days, in the fall, early spring, and early summer. Do not apply more than 1.5 quarts per acre of Surflan A.S. in any single application.

Application Equipment

Apply Surflan A.S. evenly over the turfgrass area. Avoid spray pattern skips and overlaps that may result in incomplete coverage or over-application. For best results use application equipment designed to uniformly broadcast liquid herbicides. Calibrate application equipment prior to use, according to manufacturer's directions. Check equipment frequently to make sure it is working properly and distributing spray uniformly.

Reseeding

Herbicides that control annual weeds may also affect establishment of desirable turfgrass seedlings. Reseeding should be delayed for at least 90-120 days following application of Surflan A.S.. When reseeding, it is essential that proper cultural practices such as soil cultivation and seedbed preparation, irrigation and fertilization be followed. For satisfactory reseeding results following Surflan A.S. use, the seeding rate should be increased and equipment designed to place seed in full contact with soil (such as the Rogers Aero Seeder) should be employed.

Warranty Disclaimer

DowElanco warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. DOWELANCO MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of DowElanco or the seller. All such risks shall be assumed by Buyer.

Limitation of Remedies

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at DowElanco's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

DowElanco shall not be liable for losses or damages resulting from handling or use of this product unless DowElanco is promptly notified of such loss or damage in writing. In no case shall DowElanco be liable for consequential or incidental damages or losses.

The terms of the "Warranty Disclaimer" above and this "Limitation of Remedies" cannot be varied by any written or verbal statements or agreements. No employee or sales agent of DowElanco or the seller is authorized to vary or exceed the terms of the "Warranty Disclaimer" or this "Limitation of Remedies" in any manner.

PROJECT NARRATIVE:
for

SAFEWAY STORE NUMBER 1533
COTTONWOOD CENTRE, GRAND JUNCTION

February 29, 1996

Purpose of this Application

The purpose for this application is to request an approval of a minor subdivision for a shopping center facility with a Safeway as anchor to be named the Cottonwood Centre.

The facility will developed on a 10.625 acres at the SE corner of 29 Road and F Road. The facility will be developed by the owner, Walter K. Waymeyer with the construction and long term maintenance of the site improvements the responsibility of Safeway and the entire site will be leased by Safeway

Proposed Facilities

The proposed facilities to be constructed on the site are as follows:

Safeway Store - 55,220 Sq. Ft.
Retail Site A - 9,000 Sq. Ft.
Pad No. 1 - 4,200 Sq. Ft.
Pad No. 2 - 9,000 Sq. Ft.
Pad No. 3 - 3,600 Sq. Ft.

The Retail Site A, Pad No. 1, Pad No. 2 and Pad No. 3 will be subleased by Safeway to other retail entities. Parking for the facilities will be shared by all the retail sites and is shown on the Site Plan along with the Phasing of the project.

Site Analysis

Location:

The location of Cottonwood Centre is at the SE corner of 29 Road and F Road. It contains 10.625 acres and is a part of the NW 1/4 of the NW 1/4 of Section 18, Township 1 South, Range 1 East of the Ute Meridian.

Existing Land Use:

The existing use and past use of the site is appears to have been agricultural in nature but currently not being used for agriculture and is in a fallow state. The site is covered with small trees, grass and infrequently spaced shrubs. There appears to be some alkali problems with soil.

Surrounding Land Use:

The surrounding land use in the immediate vicinity of the acre site is generally residential and considered to be moderate to high density. Some areas are zoned residential but are currently being used as agricultural. The attached section of the Mesa County Zoning map depicts the zoning in the general area surrounding the proposed Cottonwood Centre.

Access:

Access to the site is from a full movement entrance at 29 Road from the west into the site. Further access is from a 3/4 movement at F Road. Service entrances will be provided at the far south side of the site at 29 Road and at the far east side of the site at F Road for service trucks.

Utility Services:

All major utilities will be provided to the site by the following:

Water	Ute Water
Sewer	Central Grand Valley
Gas and Electric	Public Service
Cable TV	TCI Cable
Telephone	US West
Irrigation	Palisade Irrigation District

An 8" Water Line will be looped from a 12" diameter main in F Road to provide domestic water and fire protection to the site. Sewer will be provided by the existing sewer line in 29 Road which flows south. Both water and sewer on the site will be private and will be maintained by Safeway.

Gas, electric. cable and phone service will be provided by a main loop around the east and south side of the site accessing from 29 Road and F Road.

Each pad site will be provided with a sewer, water tap, fire line, gas, electric and phone service during phase I construction.

Irrigation:

Irrigation water is located on the west side of the site and is available for use with this development. At this time, the plans for irrigation of the landscape areas of the site are not complete, however it appears that using the domestic water system for irrigation of the small landscape areas will be used due to the difficulty and expense of providing irrigation water to these landscape sites. The irrigation system will, however, be modified to assure transportation of the irrigation water downstream of this site.

Soils and Geology:

Soils on this site consist of 2/3 (Re) Ravola Loam and 1/3 (Ra) Ravola Clay each with 2% slope (see soil classifications and map included with this submittal)

Fire Protection:

Fire protection on the site will be provided by fire hydrants connected to the Ute Water system located as shown on the preliminary utility plan

Proposed Land Use:

This proposal calls for the ultimate development of 81,020 square feet of mixed retail space on the 10.625 acre site. Parking for the retail space will be shared through lease agreements between Safeway and the other retail spaces. The site will be landscaped as required by the City of Grand Junction requirements which will provide a pleasant shopping atmosphere.

Drainage:

Drainage from the site is shown on the preliminary grading and drainage plan included with this submittal. In general the drainage will flow in gutters and storm sewers from the site into a detention pond located at the SE corner of the site. In conjunction with this project, an existing open drainage ditch along the east side of the site will be placed in conduit and the ditch covered. This drainage ditch transports ground water and irrigation tailwater flow from the north side of the site and exits to the south. Grand Junction Drainage District has been contacted regarding the relocation of this drainage ditch and have had no objection. The detention pond will release flows into the existing drain pipe which exits the site to the south. (see preliminary drainage plan)

Traffic:

A traffic study for this development has been prepared and will be submitted with the Site Plan review package to follow. Extensive improvements to both F Road and 29 Road will be provided due to the findings of this study and are shown on the site plan, and will be further defined by the Site Plan review submittal.

Development Schedule:

The schedule for this development will be phased as shown on the site plan. The first phase would include the construction of the necessary street improvements along both F Road and 29 Road, entrances, parking, drainage facilities, all necessary wet and dry utilities, and the Safeway Store. The 3 pad sites will be developed as these areas are leased.

Future Submittals:

The information contained in this narrative is general in nature. The submittal for the Site Plan review will contain the details of the above information and the design of the site.

FELSBURG
HOLT &
ULLEVIG

March 7, 1996

Ms. Jody Kliska, P.E.
Development Engineer
City of Grand Junction
250 North 5th Street
Grand Junction, CO 81501

RE: Safeway Cottonwood Center Traffic Impact Analysis
FHU Reference # 95-191

Dear Ms. Kliska:

This letter addresses the additional analysis requested for the above mentioned study. The analysis pertains to the impacts at the 29 Road/Orchard Avenue intersection, which is depicted in Figure 1. This intersection is currently unsignalized, and the traffic movements are controlled by STOP signs on all four single-lane approaches.

Daily traffic data collected by *Mesa County Traffic Services* is the basis for this analysis. The daily volumes used in the analysis reflect the existing conditions (counts were conducted after the 29½ Road to 30 Road segment of Orchard Avenue was constructed). These daily volumes are reported on Figure 1.

It should be noted that an intersection analysis requires peak hour turning movement volumes. However, as only daily traffic volumes were provided, the turning movement volumes have been estimated. Based on our conversation and a review of traffic count data in the Grand Junction area, the peak hour traffic was assumed to be 10 percent of the daily traffic. Furthermore, left and right turn volumes were assumed to be approximately 10 percent each of the approach volumes. The estimated turning movement volumes are also depicted in Figure 1.

The most accepted method for intersection analysis is presented in the *Highway Capacity Manual*, Transportation Research Board, Third Edition, 1985 (Updated 1994), and this has been utilized for the Level of Service (LOS) analysis. The analysis shows that the intersection operates at an acceptable LOS C during the peak hour. The detailed calculation worksheets are attached.

Specializing in Transportation
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Englewood, Colorado 80111
(303) 721-1440 Fax (303) 721-0832

The *Safeway Cottonwood Center Traffic Impact Analysis* report details the peak hour site generated trips (Figure 6 in the report). The report shows that site is expected to result in an increase of 210 trips (105 northbound and 105 southbound) at the 29 Road/Orchard Avenue intersection. The estimated distribution of the trips at this intersection is depicted in Figure 2 and the total traffic volumes (sum of existing and site generated volumes) are depicted in Figure 3. The intersection analysis of the total volumes shows that the intersection is expected to operate at an acceptable LOS D.

Thus, although the project will result in increased volumes at the 29 Road/Orchard Avenue intersection, it is expected that this impact will not be significant. It is expected that in the long term future, left turn lanes may be required on all approaches. However, this will be primarily a result of the increase in background traffic, and not the site specific traffic.

I hope this letter has addressed your concerns about the impact of the project on the 29 Road/ Orchard Avenue intersection. If you have any questions regarding this analysis, please contact me at (303) 721-1440.

Sincerely,

FELSBURG HOLT & ULLEVIG

Pawan Maini

Pawan Maini
Transportation Engineer

attachment

cc: Mike Wein, Safeway, Inc.
Gary Harrison, Concepts West Architecture, Inc.
95-191 File

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LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

XXXX = Average Daily Traffic Volumes

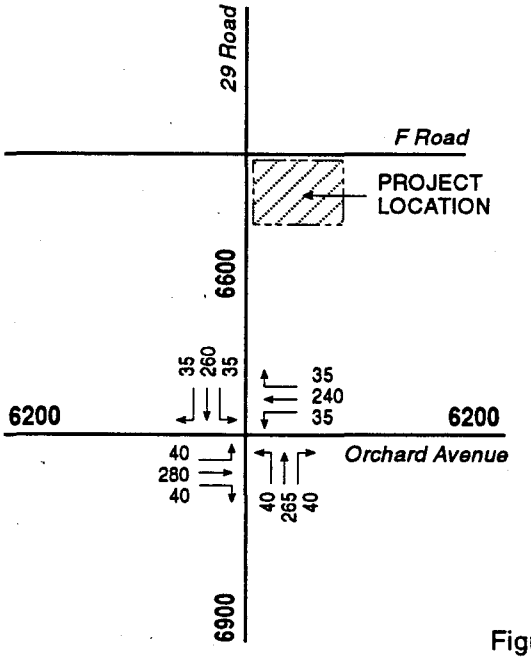

Figure 1

Existing Traffic Volumes

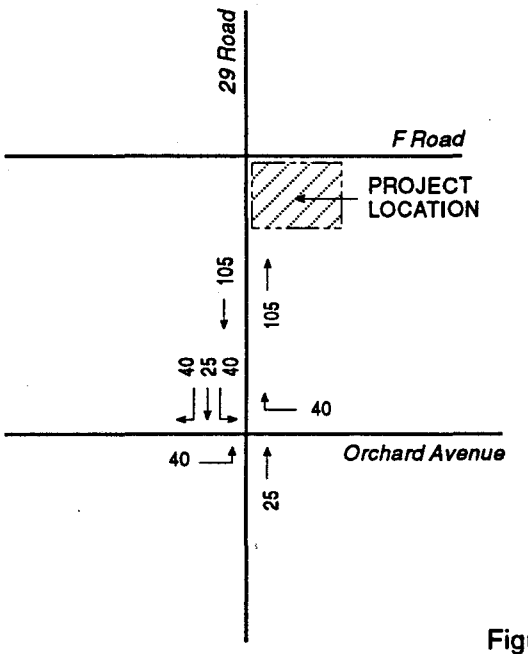

Figure 2

PM Peak Hour

Site Generated Traffic Volumes

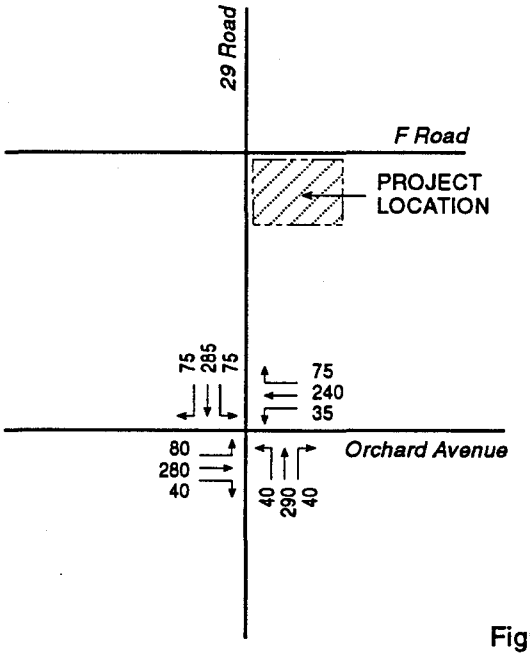

Figure 3

Existing + Site Generated

PM Peak Hour Traffic Volumes

North

Volume Summary and Capacity Analysis WorkSheet

	EB	WB	NB	SB
LT Flow Rate	42	37	42	37
RT Flow Rate	42	37	42	37
Approach Flow Rate	379	327	363	348
Proportion LT	0.11	0.11	0.12	0.11
Proportion RT	0.11	0.11	0.12	0.11
Opposing Approach Flow Rate	327	379	348	363
Conflicting Approaches Flow Rate	711	711	706	706
Proportion, Subject Approach Flow Rate	0.27	0.23	0.26	0.25
Proportion, Opposing Approach Flow Rate	0.23	0.27	0.25	0.26
Lanes on Subject Approach	1	1	1	1
Lanes on Opposing Approach	1	1	1	1
LT, Opposing Approach	37	42	37	42
RT, Opposing Approach	37	42	37	42
LT, Conflicting Approaches	79	79	79	79
RT, Conflicting Approaches	79	79	79	79
Proportion LT, Opposing Approach	0.11	0.11	0.11	0.12
Proportion RT, Opposing Approach	0.11	0.11	0.11	0.12
Proportion LT, Conflicting Approaches	0.11	0.11	0.11	0.11
Proportion RT, Conflicting Approaches	0.11	0.11	0.11	0.11
Approach Capacity	518	507	517	513

****

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	379	518	0.73	16.2	C
WB	327	507	0.65	11.6	C
NB	363	517	0.70	14.4	C
SB	348	513	0.68	13.1	C

Intersection Delay = 13.91
Level of Service (Intersection) = C

****

File Name 29ORCHEX.HC0
Streets: (N-S) 29 Road (E-W) Orchard Avenue
Analyst..... PM
Date of Analysis..... 3/6/96
Other Information..... Existing Traffic Counts

All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0>	1<	0	0>	1<	0	0>	1<	0	0>	1<	0
Volumes	40	280	40	35	240	35	40	265	40	35	260	35
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Center For Microcomputers In Transportation

HCS: Unsignalized Intersection Release 2.1 Page 1

****

File Name 29ORCHST.HC0
Streets: (N-S) 29 Road (E-W) Orchard Avenue
Analyst..... PM
Date of Analysis..... 3/6/96
Other Information..... Existing + Site Generated Traffic Counts

All-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0>	1<	0	0>	1<	0	0>	1<	0	0>	1<	0
Volumes	80	280	40	35	240	75	40	290	40	75	285	75
PHF	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Grade		0			0			0			0	
MC's (%)	0	0	0	0	0	0	0	0	0	0	0	0
SU/RV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
CV's (%)	0	0	0	0	0	0	0	0	0	0	0	0
PCE's	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Intersection Performance Summary

Movement	Approach Flow Rate	Approach Capacity	V/C Ratio	Average Total Delay	LOS
EB	421	528	0.80	20.7	D
WB	369	466	0.79	20.3	D
NB	389	516	0.75	17.5	C
SB	458	535	0.86	25.8	D

Intersection Delay = 21.30
Level of Service (Intersection) = D

The Bank of Nova Scotia
San Francisco Agency
580 California Street, Suite 2100
San Francisco, CA, U.S.A. 94104
Mailing Address: P.O. Box 3716
San Francisco, CA, U.S.A. 94119
Tel: (415) 986-1100
Fax: (415) 397-0791
Telex: 00340602

Scotia Capital

VIA CERTIFIED MAIL

April 4, 2002

Grand Junction Community Development Dept.
250 North Fifth street
Grand Junction, Colorado 81501-2668

Attn: Mr. Michael T. Drollinger – Senior Planner

Ref: Our Irrevocable Standby Letter of Credit No. S026/81695/97
For USD190,000.00

Gentlemen:

In accordance with the terms and conditions of the subject Letter of Credit, we advise you that the Bank of Nova Scotia elects not to extend the Letter of Credit beyond its current expiry date of May 27, 2002.

Kindly forward to us the original Letter of Credit in due course for our cancellation.

Vincent R. Inocencio
Senior Operations Officer

Mark C. Conroy
Senior Assistant Agent

RECEIVED
APR 0 8 2002
COMMUNITY DEVELOPMENT
DEPT.

SPR - 1996 - 107

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

Irrevocable Standby Letter of Credit

February 26, 1997

Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attention: Michael T. Drollinger, Senior Planner

Re: IRREVOCABLE STANDBY LETTER OF CREDIT NO.S026/81695/97 FOR USD190,000.00 ISSUED BY THE BANK OF NOVA SCOTIA, SAN FRANCISCO AGENCY

Gentlemen:

We hereby open our Irrevocable Standby Letter of Credit No.S026/81695/97 (the "Credit") in your favor for drawings up to the aggregate amount of USD$190,000.00 (One Hundred and Ninety Thousand and 00/100 United States dollars) effective immediately at our office at 580 California Street, 21st Floor, San Francisco, California 94104, for the account of Safeway Inc., 4th & Jackson Street, Oakland, California 94660.

We hereby undertake to honor you sight draft(s) drawn on us bearing upon its face the clause "Drawn under letter of credit No. S026/81695/97 dated February 26, 1997, accompanied by the following documents.

1. This Credit

2. A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway Inc has failed to complete the improvements required in connection with the Safeway Project - SE Corner 29 Road and F Road.

This forms part of the Bank of Nova Scotia San Francisco Agency Irrevocable Standby Letter of Credit No. S026/81695/97 for USD 190,000.00

The amount of each draft which is negotiated pursuant to this Credit, together with the date of negotiation, must be endorsed on the reverse side of the Credit.

We hereby agree with you that drafts drawn under and in compliance with the terms of this Credit will be duly honored by us if presented at this office or by registered mail on or before the expiration date of February 26, 1998 or any extended date, it being a condition of this Credit that it shall be automatically extended without written amendments for additional periods of Ninety (90) days from this or any future expiration date unless at least Thirty (30) days prior to such date we shall notify you in writing by certified mail at your above address that we elect not to renew this Credit for such additional period.Draft presentation before no later than 9:00 a.m. Pacific Standard Time on any business day shall be honored before 5:00 p.m. Pacific Standard Time on the same business day by wire transfer in immediately available funds to any account designated by you (or any other reasonable means specified by you). Draft presentation after 9:00 a.m. Pacific Standard Time and before 5:00 p.m. Pacific Standard Time, on any business day shall be honored on the following business day in immediately available funds to any account designated by you (or any other reasonable means specified by you). As used in this Credit, the term "business day" means a day other than Saturday, Sunday or any day in which banking institutions in the State of California are authorized or required by law to close.

This Credit may be amended to increase or decrease the amount that Beneficiary is entitled to draw hereunder if the Bank delivers (1) an amendment to this Credit to such effect or (ii) an Amended and Restated Irrevocable Letter of Credit in the form of this credit and upon delivery of this Credit for cancellation.

This Credit is governed by the Uniform Customs and Practice for Documentary Credits, 1993 revision, ICC Publication No. 500. This Letter of Credit shall not be transferable and it shall be governed by the laws of the State of California.

Very truly yours,

Vincent Inocencio
Sn. Operations Officer

Cecilia Bernardo
Assistant Agent

M:\safsto\97S026.LC

REVIEW COMMENTS

FILE #SPR-96-107 **TITLE HEADING:** Safeway at Cottonwood Center

LOCATION: SE corner of 29 & Patterson Roads

PETITIONER: Safeway, Inc.

PETITIONER'S ADDRESS/TELEPHONE: 6900 S Yosemite
Englewood, CO 80112
303-843-7572

PETITIONER'S REPRESENTATIVE: LANDesign, LLC

STAFF REPRESENTATIVE: Michael Drollinger

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

MESA COUNTY BUILDING DEPARTMENT **5/1/96**
Bob Lee **244-1656**

No comments. We are currently reviewing this project and it seems to be in order.

GRAND JUNCTION DRAINAGE DISTRICT **5/3/96**
John L. Ballagh **242-4343**

The Safeway site at 29 and F Road is wholly within the Grand Junction Drainage District. The developer has reached agreement with the District to relocate the Hans Drain. There is an easement which is yet to be signed and recorded which needs to be done prior to the relocation of the drain. The District will accept responsibility for operation and maintenance of the relocated drain which will be in pipe. The Hans Drain, Safeway Tile, will be the District's facility. The incoming pipe from the detention pond, the pond, and all of the "interior storm sewer" will not be the responsibility of the Drainage District. Operation and maintenance of the interior facilities seems to be addressed in the declaration of easements with covenants and restrictions affecting land.

The fence along the south line should not be constructed so that the existing Grand Junction Drainage District manhole is "under" the fence or so close that access with a piece of pipe cleaning equipment is effectively prohibited. A gate may be necessary or an offset in the line of the fence could allow continued access by Grand Junction Drainage District equipment and personnel. While the 14' strip just inside the south line is to be platted as a multi-purpose easement the Drainage District specifically requests that no pedestals be placed between the existing manhole on the Hans Drain and the manhole identified as HD1.

The plan/profile sheet for the Hans Drain needs to show the incoming pipe from the detention pond to MH-HD1. Grand Junction Drainage District standards do not require RCP in 12" diameter, NRCP may be used if bedded properly in 3/4 screened rock.

There may be an irrigation spill that has not been considered. Near the proposed MH-HD3 there is an existing irrigation spill which enters the Hans Drain. Unless that irrigation water is to be relocated, there must be a pipe into MH-HD3.

CITY POLICE DEPARTMENT **5/7/96**
Dave Stassen **244-3587**

1. I would like to see a lighting plan if possible.
2. Some provision should be included in the maintenance agreement for the project to ensure the expeditious removal of graffiti from the perimeter wall.

UTE WATER **5/8/96**
Gary R. Mathews **242-7491**

1. Water mains inside of the development will be maintained by the developer and not Ute Water. Check valves are required on all inside fire protection and large meters. Contact with Ute Water is needed to discuss the requirement for the Safeway building. All water mains are inspected by Ute Water and notification is required before installation of any water mains.
2. Water mains shall be C-900, class 150. Installation of pipe fittings, valves and services including testing and disinfection shall be in accordance with Ute Water standard specifications and drawings.
3. Construction plans required before development begins.
4. Policies and fees in effect at the time of application will apply.

STATE ENVIRONMENTAL HEALTH **5/9/96**
Dwain Watson **248-7156**

No comments.

CITY FIRE DEPARTMENT **5/9/96**
Hank Masterson **244-1414**

The Fire Department requires the following changes to the utility plan:

1. Add one additional fire hydrant, located along 29 Road at the southwest service entrance.
2. Move the hydrant proposed for just west of Lot 2 to a location along F Road and just west of the main F Road entrance to the site.
3. Move the hydrant proposed for just east of Lot 4 about 75 feet southwest.

These changes are shown on the site plan submitted along with our comments.

PUBLIC SERVICE COMPANY **5/10/96**
Dale Clawson **244-2695**

No comments.

CITY ATTORNEY **5/13/96**
John Shaver **244-1501**

1. What is the purpose of the "Easement and Agreement"?
2. The easement out to be dedicated to the City for the use and benefit of Grand Junction Drainage District and any indemnity between Grand Junction Drainage District and Waymeyer/Safeway is separate.
3. See attached C.C. & R.'s for additional concerns.

CITY DEVELOPMENT ENGINEER **5/15/96**
Jody Kliska **244-1591**

See attached comments.

CITY COMMUNITY DEVELOPMENT **5/15/96**
Michael Drollinger **244-1439**
See attached comments.

CORPS OF ENGINEERS **5/10/96**
Randy Snyder **243-1199**
See attached letter.

CITY UTILITY ENGINEER **5/14/96**
Trent Prall **244-1590**
Ute sign-off block, rather than City of Grand Junction, required on all water plans. No other comments.

CITY PARKS & RECREATION **5/17/96**
Shawn Cooper **244-3869**
Is there a bike lane being proposed along the east side of 29 Road? The current Master Plan (multi-modal) indicates 29 Road as a bike-way.

TO DATE, COMMENTS NOT RECEIVED FROM:
City Property Agent
Mesa County Planning
Palisade Irrigation
Central Grand Valley Sanitation
U.S. West
Persigo Waste Water Treatment Facility
TCI Cablevision

FILE

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

April 29, 1996

Mike Wein
Safeway Inc.
6900 S. Yosemite
Englewood CO 80112-1412

RE: Safeway Project - SE Corner 29 Road and F Road

Dear Mr. Wein:

The intent of this letter is to outline for you the Site Plan Review process for the Safeway project. A number of staff members have advised me that they have been questioned by contractors regarding construction details for the project and have been told that the project has already been bid. As of this morning we have not yet received a formal submittal for the project, although I expect a submittal later today. The decision to bid the project prior to City review is at your risk and will in no way affect the scope of the Site Plan Review which City staff and review agencies will perform. It is generally the case that changes are required of the petitioner as a result of review of the plans and you will be required to make the necessary changes to the plans.

The Site Plan Review process begins once a complete application has been accepted and processed by our office. The review period for review agencies is *ten working days*. The review agency comments are due at the end of the ten day period. On the following day our office compiles the comments and forwards them to you and your representative. You are required to respond to the comments in writing and must revise the plans as required within thirty days of receiving review agency comments. Once a response is received, we will review the materials and render a decision on the Site Plan application within five working days. Development of the project must commence within six months of final approval of the plans. Please refer to Section 4-14 of the Zoning and Development Code for further details on the Site Plan Review process.

As a reminder, no site work is permitted prior to approval of development plans and issuance of a Planning Clearance by our office. Also, all public improvements must be guaranteed prior to issuance of a Planning Clearance. Monty Stroup is familiar with the procedure and process of plan approval.

Please do not hesitate to contact me should you have any questions or if you require further clarification of any item. I will follow-up with a letter specifying the review period dates once

we are in receipt of your development application.

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: Monty Stroup, LANDesign
Gary Harrison, Concepts West Architects (via FAX only)

h:\lettrs\wein1.ltr

FILE

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

May 1, 1996

Mike Wein
Safeway Inc.
6900 S. Yosemite
Englewood CO 80112-1412

RE: Safeway Project - SE Corner 29 Road and F Road

Dear Mr. Wein:

We are in receipt of your Site Plan Review application for the Safeway Cottonwood Centre. The application was deemed complete and was processed and sent to review agencies yesterday. The comments from the review agencies are due back in our office by 5PM on May 15th. The comments will be compiled and sent to you and your consultants on May 16th.

While I have of course not yet had an opportunity to review the plans in detail, I would like to mention that the plans and accompanying documents as submitted by your consultants were very professionally assembled which will assist City staff greatly in our review.

Please do not hesitate to contact me should you have any questions or if you require further clarification of any item.

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: Monty Stroup, LANDesign
Gary Harrison, Concepts West Architects

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

REPLY TO
ATTENTION OF

May 10, 1996

Regulatory Branch (199675214)

Mr. Michael Drollinger
City of Grand Junction
250 North 5th Street
Grand Junction, Colorado 81501

Dear Mr. Drollinger:

We are responding to your written request for comment on the proposed Safeway Store Number 1533, Cottonwood Centre. The project is located within Section 8, Township 1 South, Range 1 East, Mesa County, Colorado.

Based on a site inspection by Mr. Randy Snyder of this office on May 7, 1996, we have determined that a Department of the Army permit will not be required for this project.

We have assigned number 199675214 to this project. Please refer to this number in any correspondence with this office. If you have any questions, please write me at the address below or telephone (970) 243-1199.

Sincerely,

Randy Snyder
Project Manager
Ecologist

Central Grand Valley
Sanitation District

May 13, 1996

Michael Drollinger
City of Grand Junction
Planning Dept.
250 N. 5th St.
Grand Junction, Co. 81501

Re: Development Plan Reviews

Dear Michael:

We recently received a preliminary set of plans for the new Safeway store to be built at 29 and F Road. The review deadline given is May 14th. Our Board policy states that we have 30 days and 2 board meetings in which to review the plans and make any necessary comments. Since we only received these plans the week before, it does not allow for enough time to review. In the future, please allow the time required as stated in our board policy. This would be greatly appreciated.

Sincerely,

Chris Shaffer

Chris Shaffer
District Manager

541 Hoover Drive · P.O. Box 40219 · Grand Junction, CO 81504
(970) 434-2276 · Fax (970) 434-2040

To: MIchael Drollinger
Cc: Dan Wilson
From: John Shaver
Subject: Safeway LOC
Date: 5/13/96 Time: 2:02PM

Michael,

This message is being sent to you in response to your request that I review the Safeway/Nova Scotia Bank letter of credit.

As we discussed last week, generally the city requires that letters of credit be drawn on a local bank or minimally on an out of town bank that has a coordinate banking relationship with a Colorado bank. The proposed Safeway letter of credit is neither.

If you add the cost of travel to San Francisco to collect the LOC to the improvements agreement as a separate line item or if Safeway guarantees that cost with cash, then we can accept the form of the proposed LOC. If not then the LOC needs to be payable in Colorado.

The content of the proposed LOC has some problems:

1) the LOC is addressed to you as a "planer"
2) the amount in the first paragraph is wrong;
3) in the second paragraph, line 2, the phrases "the following" and "by site plan review" should be deleted-by the literal wording the credit would not be effective if other requirements were imposed by PC or CC;
4) in the fourth paragraph, second line the phrase "at this office or by registered mail on or before" needs to be consistent with the banking relationship discussed above. In the same paragraph the expiration date of the LOC should be extended past the date of the improvements are to be completed (a minimum of 30 is probably safe).

Once the LOC is complete will Impact AP tickle it? If not let me know and I'll put a tickler on it.

Should you have any questions or if I may otherwise be of assistance, please let me know.

jps

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

Irrevocable Standby Letter of Credit

May 14, 1996

Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attention: Michael T. Drollinger, Senior Planer

Re: IRREVOCABLE STANDBY LETTER OF CREDIT NO. S007/81695/96
FOR US$132,473.45 ISSUED BY THE BANK OF NOVA SCOTIA,
SAN FRANCISCO AGENCY

Gentlemen:

We hereby open our Irrevocable Standby Letter of Credit No. S007/81695/96 (the "Credit") in your favor for drawings up to the aggregate amount of U.S.$132,473.45 (U.S. One Hundred Thirty Two Thousand Four Hundred Seventy Three and 45/100 Dollars) effective immediately at our office at 580 California Street, 21st Floor, San Francisco, California 94104, for the account of Safeway Inc., 4th & Jackson Street, Oakland, California 94660.

We hereby undertake to honor your sight draft(s) drawn on us bearing upon its face the clause "Drawn under letter of credit No. S007/81695/96 dated May 14, 1996, accompanied by the following documents:

1. This Credit

2. A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway Inc has failed to complete the following improvements, as required by Site Plan Review in connection with the Safeway Project - SE Corner 29 Road and F Road.

The amount of each draft which is negotiated pursuant to this Credit, together with the date of negotiation, must be endorsed on the reverse side of the Credit.

We hereby agree with you that drafts drawn under and in compliance with the terms of this Credit will be duly honored by us if presented at this office or by registered mail on or before the expiration date of May 9, 1997 or any extended date, it being a condition of this Credit that it shall be automatically extended without written amendments for additional periods of Ninety (90) days from this or any future expiration date unless at least Thirty (30) days prior to such date we shall notify you in writing by certified mail at your above address that we elect not to renew this Credit for such additional period.

(This forms part of The Bank of Nova Scotia San Francisco Agency
Irrevocable Standby Letter of Credit No.S007/81695/96 for US$132,473.45)

Draft presentation before no later than 9.00 a.m. Pacific Standard Time on any business day shall be honored before 5.00 p.m. Pacific Standard Time on the same business day by wire transfer in immediately available funds to any account designated by you (or any other reasonable means specified by you). Draft presentation after 9.00 a.m. Pacific Standard Time and before 5.00 p.m. Pacific Standard Time, on any business day shall be honored on the following business day in immediately available funds to any account designated by you (or any other reasonable means specified by you). As used in this Credit, the term "business day" means a day other than Saturday, Sunday or any day in which banking institutions in the State of California are authorized or required by law to close.

This Credit may be amended to increase or decrease the amount that Beneficiary is entitled to draw hereunder if the Bank delivers (1) an amendment to this Credit to such effect or (ii) an Amended and Restated Irrevocable Letter of Credit in the form of this Credit and upon delivery of this Credit for cancellation.

This Credit is governed by the Uniform Customs and Practice for Documentary Credits, 1983 revision, ICC Publication No. 400. This Letter of Credit shall not be transferable and it shall be governed by the laws of the State of California.

Authorized Signature

Authorized Signature C1403

KS5\LC-S007.96

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

July 10, 1996

Grand Junction Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attn: Mr. Michael T. Drollinger
Senior Planner

Our Standby Letter of Credit Number S007/81695/96 issued in your favor for the account of Safeway Inc.

Gentlemen:

Please find attached our amendment to the above subject Letter of Credit increasing the amount from USD132,473.45 to USD139,061.15 and also changing some of the language of the Letter of Credit itself.

Please acknowledge receipt by signing on the copy of this letter.

Sincerely,

Vincent R. Inocencio
Senior Operations Officer

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

May 14, 1996

Michael T. Drollinger
Senior Planner
Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Dear Michael,

Please find enclosed our Letter of Credit in the amount of $132,473.45 related to the Safeway Cottonwood Centre.

Sincerely,

John A. Quick

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

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

February 26, 1997

Attn: Mr. Michael T. Drollinger
Senior Planner

Our Standby Letter of Credit number S026/81695/97 for USD190,000.00

Gentlemen:

Please find attached our above subject Letter of Credit issued in your favor for the account of Safeway Inc.

This replaces our Letter of Credit Number S007/81695/96 in the amount of USD132,473.45 dated May 14, 1996, subsequently amended to USD139,061.15 on July 10, 1996.

Accordingly, please forward to us the original of the above Letter of Credit and the amendment for cancellation.

If you have any question or should you need additional information, please do not hesitate to call the undersigned.

Very Truly Yours,

Vincent R. Inocencio
Sr. Operations Officer

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

Irrevocable Standby Letter of Credit

February 26, 1997

Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attention: Michael T. Drollinger, Senior Planner

Re: IRREVOCABLE STANDBY LETTER OF CREDIT NO.S026/81695/97 FOR USD190,000.00 ISSUED BY THE BANK OF NOVA SCOTIA, SAN FRANCISCO AGENCY

Gentlemen:

We hereby open our Irrevocable Standby Letter of Credit No.S026/81695/97 (the "Credit") in your favor for drawings up to the aggregate amount of USD$190,000.00 (One Hundred and Ninety Thousand and 00/100 United States dollars) effective immediately at our office at 580 California Street, 21st Floor, San Francisco, California 94104, for the account of Safeway Inc., 4th & Jackson Street, Oakland, California 94660.

We hereby undertake to honor you sight draft(s) drawn on us bearing upon its face the clause "Drawn under letter of credit No. S026/81695/97 dated February 26, 1997, accompanied by the following documents.

1. This Credit

2. A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway Inc has failed to complete the improvements required in connection with the Safeway Project - SE Corner 29 Road and F Road.

This forms part of the Bank of Nova Scotia San Francisco Agency Irrevocable Standby Letter of Credit No. S026/81695/97 for USD 190,000.00

The amount of each draft which is negotiated pursuant to this Credit, together with the date of negotiation, must be endorsed on the reverse side of the Credit.

We hereby agree with you that drafts drawn under and in compliance with the terms of this Credit will be duly honored by us if presented at this office or by registered mail on or before the expiration date of February 26, 1998 or any extended date, it being a condition of this Credit that it shall be automatically extended without written amendments for additional periods of Ninety (90) days from this or any future expiration date unless at least Thirty (30) days prior to such date we shall notify you in writing by certified mail at your above address that we elect not to renew this Credit for such additional period.Draft presentation before no later than 9:00 a.m. Pacific Standard Time on any business day shall be honored before 5:00 p.m. Pacific Standard Time on the same business day by wire transfer in immediately available funds to any account designated by you (or any other reasonable means specified by you). Draft presentation after 9:00 a.m. Pacific Standard Time and before 5:00 p.m. Pacific Standard Time, on any business day shall be honored on the following business day in immediately available funds to any account designated by you (or any other reasonable means specified by you). As used in this Credit, the term "business day" means a day other than Saturday, Sunday or any day in which banking institutions in the State of California are authorized or required by law to close.

This Credit may be amended to increase or decrease the amount that Beneficiary is entitled to draw hereunder if the Bank delivers (1) an amendment to this Credit to such effect or (ii) an Amended and Restated Irrevocable Letter of Credit in the form of this credit and upon delivery of this Credit for cancellation.

This Credit is governed by the Uniform Customs and Practice for Documentary Credits, 1993 revision, ICC Publication No. 500. This Letter of Credit shall not be transferable and it shall be governed by the laws of the State of California.

Very truly yours,

Vincent Inocencio
Sn. Operations Officer

Cecilia Bernardo
Assistant Agent

M:\safsto\97S026.LC

Scotiabank
THE BANK OF NOVA SCOTIA

81695 - San Francisco Agency
BRANCH

July 10, 1996
DATE OF ISSUE

AMENDMENT TO LETTER OF CREDIT	ISSUING BANK'S NO. S007/81695/96	ADVISING BANK'S NO.

ADVISING BANK

APPLICANT
Safeway Inc.
Fourth & Jackson Streets
Oakland, CA 94660

BENEFICIARY
Grand Junction Community Development
250 North Fifth Street
Grand Junction, CO 81501-2668

AMOUNT
USD132,473.45

DATE OF ISSUE
May 14, 1996

THIS AMENDMENT IS TO BE CONSIDERED AS PART OF THE ABOVE LETTER OF CREDIT AND MUST BE ATTACHED THERETO

DEAR SIR(S)

THE ABOVE MENTIONED CREDIT IS AMENDED AS FOLLOWS:

1) Amount increased by USD6,587.70 From USD132,473.45 To USD139,061.15 (One Hundred Thirty Nine Thousand Sixty One Dollars & 15/100 United States Dollars) To cover cost of travel to San Francisco, California in the event of draw.

2) Delete in its entirety Paragraph 2, item 2.

3) Insert the following in Paragraph 2, item 2:

A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway, Inc. has failed to complete the improvements required in connection with the Safeway Project - S E corner 29 Road and F Road.

Except so far as otherwise expressly stated this documentary credit is subject to the Uniform Customs and Practice for Documentary Credits (1993 Revision) International Chamber of Commerce Publication No. 500.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED

THE ADVISING BANK IS REQUESTED TO NOTIFY THE BENEFICIARY OF THIS AMENDMENT

YOURS FAITHFULLY

AUTHORIZED SIGNATURE

AUTHORIZED SIGNATURE

ADVISING BANK'S NOTIFICATION

REMARKS, PLACE, DATE, NAME AND SIGNATURE OF THE ADVISING BANK

EXCEPT SO FAR AS OTHERWISE EXPRESSLY STATED THIS DOCUMENTARY CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS (1974 REVISION) INTERNATIONAL CHAMBER OF COMMERCE PUBLICATION NO. 290

ORIGINAL

STAFF COMMENTS

FILE :	#SPR-96-107
DATE:	May 15, 1996
STAFF:	Michael T. Drollinger, Community Development Department
	Jody Kliska, City Development Engineer
PROJECT:	Safeway Cottonwood Centre
REQUEST:	Site Plan Review
LOCATION:	SE Corner 29 Road & F Road
ZONING:	PB

Due to the extent of comments for the project together with the number of drawings, the Community Development Department and Development Engineer comments have been combined for this project. For your convenience, the review comments have been organized by sheet number.

COMMENTS:

GENERAL

1. A plan/details are required for the entrance signage to determine compliance with the zoning requirements.

2. Development Improvements Agreement (DIA) needs to include costs for City inspection, construction supervision and surveying and as-built plans. Any adjustments to the quantities as a result of revision of plans must be included in the final DIA.

3. Drainage report is acceptable.

4. The Geotechnical Report did not contain a recommended pavement structure for the 29 Road and F Road improvements. Please submit the pavement design.

5. The traffic study was previously reviewed and the additional analysis has been submitted. The report is acceptable.

6. The Transportation Capacity Payment (TCP) for Phase I is $38,654. If credit toward the TCP for public improvements is desired, a formal request must be submitted prior to recording of the plat or issuance of a Planning Clearance; whichever occurs first.

TITLE SHEET- Sheet 1 of 35

1. Approval block shall be modified as follows:

⇒ change "City Engineer Approval" to "City Development Engineer Approval"
⇒ change "Planning Director Approval" to "Community Development Approval"
⇒ remove "Engineer Approval" signature line

2. "Details" shall be removed from sheet and should be part of the detail sheets.

3. Correct existing and proposed zoning to be "PB - Planned Business", not B1.

4. See also attached SSID Manual "Cover Sheet" Drawing Standards Checklist for additional missing items.

SITE PLAN - Sheet 2 of 35

1. The requirements of Section 5-5-1H regarding bicycle parking has not been met. Please provide the proper number of bicycle parking spaces as required by Code and indicate the location(s) on the Site Plan. A bike rack detail is also required and may be shown on the Site Plan or on a detail sheet. The bicycle parking must be located in areas that are convenient for the use of both customers and employees.

2. There are no entrances shown on the north side of Pad No. 2; please correct to show locations of proposed entrances on that side.

3. The symbol for the accessible parking stall was omitted from the Legend; please add.

4. Please indicate how the requirement for accessible stalls has been met; also reference shall be made to the City standard accessible parking stall detail (including which detail sheet the detail is located on).

5. Light details shown on plan do not match light details in Legend; please correct.

6. Reference is made in the Legend to the locations of the cart corrals; please indicate the locations on the Site Plan.

7. How will maintenance of the fence take place along the eastern side of the property where the fence is almost on the property line?

8. Additional information is required regarding the effectiveness of the proposed vinyl fence as a sound reducing material. This office has serious concerns about the noise impacts of the site, especially in the vicinity of the Safeway store, Pad No. 2 and Pad No. 3. We will require that the applicant examine a masonry wall option in these areas and have an appropriate expert analyze and compare the noise reduction characteristics of a vinyl fence vs. a masonry wall. The two options shall be analyzed

and presented in a manner which allows direct comparison of the two options or another option which the petitioner wishes to suggest and analyze.

LANDSCAPE PLAN - OVERALL LAYOUT (Phase I) - Sheet 3 of 35

1. Neither the Landscape Plan or the Grading Plan indicates how the street frontage buffer requirement detailed in Section 5-5-1F2a has been met. The proposed shrub plantings alone will not be enough to meet this requirement. We suggest a 1' to 1 1/2' berm along the frontages with the shrubs placed on top of the berm. The tree planting requirements of 5-5-1F2a&b along the perimeter of the lot are additive and have not been met; additional trees will be required.

2. Regarding interior parking area landscaping (Section 5-5-1F2c) please provide a calculation of the required number of trees to be planted in the interior of the lot based on the Code requirements. I estimate that at least 70-80 trees are required; the present plan does not meet this requirement.

3. A detail must be provided to show the design of the overhang areas required in Section 5-5-1F2c(2). What type of material will the overhang be constructed of?

4. The proposed perimeter fence is identified as a "wood" fence in all landscape plans; please correct to match other plans.

5. The parking stall locations shall be shown on the Landscape Plan.

6. Please provide the reason why shrubs are not being provided in the landscape islands behind the "Retail A" building as required by Code.

7. Please carefully examine the phase I/phase II boundaries. This office will closely follow the boundaries when inspecting the property prior to issuance of a C.O. and will require all landscaping corresponding to each phase.

8. See also attached SSID Manual "Ladnscape Plan" Drawing Standards Checklist for additional missing items.

LANDSCAPE PLAN - OVERALL LAYOUT (Phase II) - Sheet 4 of 35

No additional comments - see comments for Sheet 3 and revise drawing as necessary.

LANDSCAPE PLAN N.W. - Sheet 5 of 35

No additional comments - see comments for Sheet 3 and revise drawing as necessary.

LANDSCAPE PLAN N.E. - Sheet 6 of 35

See comments for Sheet 3 and revise drawing as necessary.

1. Large cobble rock is an unacceptable landscape material for use between the detached sidewalk and F Road; please revise to indicate grass as the ground cover to be used. As a reminder, this area is required to be served by a pressurized, underground irrigation system.

LANDSCAPE PLAN S.E. - Sheet 7 of 35

No additional comments - see comments for Sheet 3 and revise drawing as necessary.

LANDSCAPE PLAN S.W. - Sheet 8 of 35

No additional comments - see comments for Sheet 3 and revise drawing as necessary.

BUILDING ELEVATIONS - Sheet 9 of 35

1. Please identify the paint colors proposed.

SITE LIGHTING PLAN - Sheet 10 of 35

1. Lighting Plan as shown does not permit an evaluation of whether the minimum lighting standards are being met. The Lighting Plan must be revised to clearly identify the 0.6 foot-candle lighting level (the minimum required) for all parking lot areas.

2. Section 5-5-1F2i(2) required that the maximum height of required lighting be 25 ft. (measured from ground level to top of fixture). Lighting proposed exceeds this standard. The Code requires lower, pedestrian lighting (max. height 12 ft.) adjacent to sidewalks and near buildings; please modify the plans accordingly.

FINAL PLAT COVER SHEET - Sheet 11 of 35

1. Please modify the dedication language for the drainage easements as follows: "All Drainage Easements hereby platted to the Owners of Lots 2 & 3 and the City of Grand Junction for the use of the Grand Junction Drainage District as perpetual easements for the conveyance . . . . . ."

FINAL PLAT - Sheet 12 of 35

1. A small piece of additional right-of-way will be required to accommodate the handicapped ramp on the west side of the west site driveway along F Road.

DEMOLITION PLAN - Sheet 13 of 35

No comments.

F ROAD FLOW LINE PLAN AND PROFILE - Sheet 14 of 35

1. Sidewalk along F Road between 29 Road and the west site driveway must be detached as per the standard principal arterial standard. The strip between F Road and the detached walk shall be covered with grass. Street trees also shall be required in the landscape strip along the entire F Road frontage with a spacing not to exceed one tree per forty linear feet.

2. Please note removal of all curb and gutter including limits of removal.

3. Please reference and provide a detail for the construction of the islands at the site driveways.

4. A pavement cross-section shall be provided which shows pavement structural section and extent of new pavement.

5. The handicapped ramps on the west site driveway shall be lined up (on an east-west alignment, not radial ramps as shown).

6. The cross pan on the east driveway is identified but not shown on the plans. Provide a detail.

29 ROAD FLOW LINE PLAN AND PROFILE - Sheet 15 of 35

1. Install curb ramps for north-south progression at driveways; do not need radial ramps.

2. Why are the existing trees shown on the plan proposed to be removed? The identified trees are to be saved if possible; if not please provide an explanation as to why removal is required.

3. Check the length and ratio of the taper proposed along 29 Road on the south site boundary - does this meet City standards? (Reference: Table 10, P. 31 TEDS Manual)

4. Please provide a note on the plan to indicate that all utilities to be relocated will be relocated in the multi-purpose easement.

F ROAD AND 29 ROAD SIGNAGE AND STRIPING PLAN - Sheet 16 of 35

1. For clarity, please do not show the layer with street (light lines), and the parking area. Just the signing and striping details are sufficient.

DEMOLITION PLAN - Sheet 13 of 35

No comments.

F ROAD FLOW LINE PLAN AND PROFILE - Sheet 14 of 35

1. Sidewalk along F Road between 29 Road and the west site driveway must be detached as per the standard principal arterial standard. The strip between F Road and the detached walk shall be covered with grass. Street trees also shall be required in the landscape strip along the entire F Road frontage with a spacing not to exceed one tree per forty linear feet.

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3. Please reference and provide a detail for the construction of the islands at the site driveways.

4. A pavement cross-section shall be provided which shows pavement structural section and extent of new pavement.

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6. The cross pan on the east driveway is identified but not shown on the plans. Provide a detail.

29 ROAD FLOW LINE PLAN AND PROFILE - Sheet 15 of 35

1. Install curb ramps for north-south progression at driveways; do not need radial ramps.

2. Why are the existing trees shown on the plan proposed to be removed? The identified trees are to be saved if possible; if not please provide an explanation as to why removal is required.

3. Check the length and ratio of the taper proposed along 29 Road on the south site boundary - does this meet City standards? (Reference: Table 10, P. 31 TEDS Manual)

4. Please provide a note on the plan to indicate that all utilities to be relocated will be relocated in the multi-purpose easement.

F ROAD AND 29 ROAD SIGNAGE AND STRIPING PLAN - Sheet 16 of 35

1. For clarity, please do not show the layer with street (light lines), and the parking area. Just the signing and striping details are sufficient.

2. Please use CDOT Standard S-627-1 to show typical pavement markings or attached ADOT standrad markings. This includes showing paint line widths and stripe colors, dimensions, and types and dimensions of legends and markings. The taper striping at the south end of the project needs to be shown.

3. For the proposed new signing, please include a legend which shows the MUTCD code and the sign legend or a picture of the sign, as shown below:

R1-1

R4-4

R3-7

R7-1

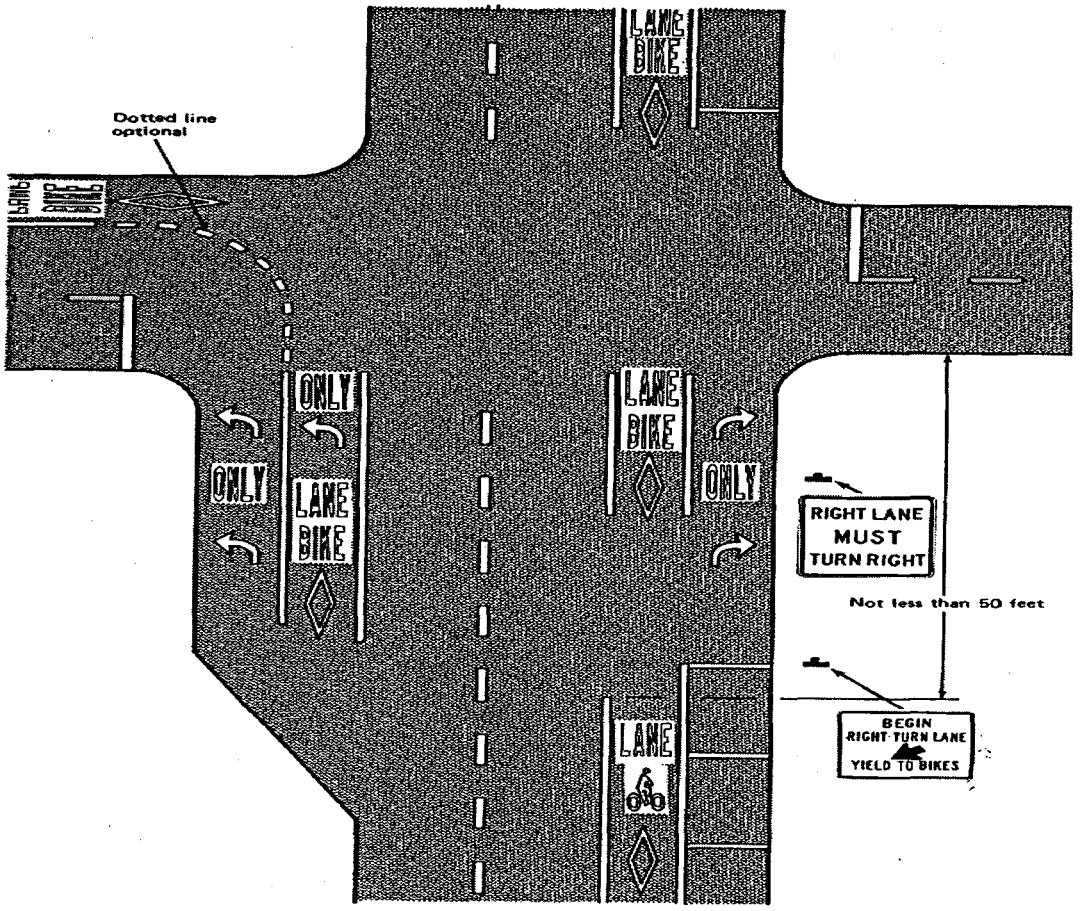
R3-17

R3-9b

4. Please add a note to this sheet which requires the contractor to contact Rick Ripley, City Traffic Services, at 244-1573, prior to any placement of signs, striping, markings or signal loops.

5. The bike lane on 29 Road will be required to be striped for through bicycle traffic rather than as shown on the plan. This modification will also require installation of a bicycle detection loop and installation of a new quadropole loop detector in the right turn lane. the striping change should be made in accordance with the figure below. A copy of details for loop and conduit installation is attached with these comments.

Figure 9-5 Intersection pavement markings - designated bicycle lane with left turn area, heavy turn volumes, one-way traffic or divided roadway.



6. Please note on the plan that paint for striping must be applied at a minimum thickness of 15 mils with application of glass beads of 5 - 7 lbs./gallon.

7. Please note on the plan permanent markings such as arrows, only legend, preferential and bike lane markings must be either an approved tape such as 3M or thermoplastic.

8. On 29 Road, delete three of the preferential lane markings (diamond) and include three bicycle symbols.

9. The following signs will be eliminated (in order from F Road intersection): R3-17, R4-4, R3-7, R4-4, R3-16, W4-2.

10. An R3-9b, Center Two Left Turn Lane sign, must be installed with the center lane striping. Recommended placement is southbound on 29 Road approximately adjacent to the cneter pair of arrrows.

11. A redlined plan is being returned with these comments. Please return to Community Development with response to comments.

INTERIOR SIGNAGE AND STRIPING PLAN - Sheet 17 of 35

1. We need a larger scale to be able to fully review this drawing; 1"=20' minimum.

2. All extraneous information not directly related to the signage and striping plan shall be removed.

3. The color, size and dimensions of all interior striping proposed on the plan shall be provided; provide large-scale details where appropriate.

4. All proposed internal traffic control signage shall be detailed on the plan(s).

5. The crosswalk area in front of the Safeway store shall be constructed as required in Section 5-5-1F2e which requires surface pavers, rather than striping, to be used.

6. An additional crosswalk which meets the requirements of Section 5-5-1F2e shall be provided between the southern termination of the sidewalk along the west F Road driveway to the front of the Retail A building.

PARKING AREA/HEAVY DRIVING AREA DEL. PLAN - Sheet 17A of 35

1. Please provide Sheet 54 referenced on this plan.

INTERIOR CURB, GUTTER AND PAVING PLAN - Sheet 18 of 35

1. Provide architectural plans and details referenced.

2. What are the "AA" references (not indicated on legend).

3. The ramp west of the Safeway store shall be straightened to align with the adjoining ramp.

INTERIOR CURB, GUTTER AND PAVING PLAN - Sheet 19 of 35

1. What are the "AA" references (not indicated on legend).

INTERIOR CURB, GUTTER AND PAVING PLAN - Sheet 20 of 35

1. What are the "AA" references (not indicated on legend).

2. Provide concrete paver details and specifications.

INTERIOR CURB, GUTTER AND PAVING PLAN - Sheet 21 of 35

1. The island in the eastern site driveway shall be moved 2 ft. north.

INTERIOR GRADING, DRAINAGE, AND EROSION CONTROL PLAN - Sheet 22 of 35

1. Does the F Road drainage flow into the site at the western F Road driveway? Please detail.

2. Is there a cross pan proposed for the eastern site driveway?

3. Please reference the detail sheet for the dual stage outlet structure.

STORM SEWER PLAN AND PROFILE - Sheet 23 of 35

1. Will the inlets be constructed to standard City details or other detail? Provide a reference on plan sheets.

STORM SEWER PLAN AND PROFILE - Sheet 24 of 35

No comments.

HANS DRAIN PLAN AND PROFILE - Sheet 25 of 35

Approval of the plan by Grand Junction Drainage District is required along with a set of signed plans which must be submitted to the Community Development Department PRIOR to issuance of a Planning Clearance.

UTILITY COMPOSITE - Sheet 26 of 35

No comments.

SANITARY SEWER PLAN AND PROFILE - Sheet 27 of 35

1. A set of approved sewer plans signed by Central Grand Valley Sanitation is required to be submitted to City Community Development PRIOR to issuance of a Planning Clearance.

SANITARY SEWER PLAN AND PROFILE - Sheet 28 of 35

See comments for Sheet 27

EROSION CONTROL DETAIL - Sheet 30 of 35

1. CDOH will be notified of construction activity. A State permit is required.

Please contact the Community Development Department (244-1430) or City Development Engineer (244-1590) if you have any questions or require further explanation of any item.

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SAFEWAY

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

SAFEWAY.

DRAWING STANDARDS CHECKLIST

LANDSCAPE PLAN

ITEM		GRAPHIC STANDARDS	OK	NA
SECTION VIII	A	Scale: 1" = 10' or 20'		
	B	Sheet size: 24"x36"		
	C	Primary features consist only of landscape features		
	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		
	H	Vertical control: Benchmarks on U.S.G.S. datum if public facilities other than SW are proposed		
	I	Orientation and north arrow		
	K	Title block with names, titles, preparation and revision dates		
	M	Legend of symbols used		
	N	List of abbreviations used		
	P	Multiple sheets provided with overall graphical key and match lines		
	Q	Contouring interval and extent		
	R	Neatness and legibility		

ITEM		FEATURES	OK	NA
-	1	Use the Site Plan as a base map		
	2	Identify areas to be covered with specific landscaping materials		
	3	Boulders, mounds, swales, water courses, rock outcroppings		
	4	Planting Material Legend includes common and botanical names, quantities, minimum purchase sizes, mature height, groundcover/perennial spacing, types of soil, and other remarks		
	5	Specification of soil type and preparation		
	6	Landscape irrigation layout, design, materials, and details (if requested by City staff)		
	7	Planting/staking and other details as required		
	8	Required note on Plan: "An underground, pressurized irrigation system will be provided"		
	9	Space for approval signature by Community Development with date and title		

COMMENTS

1. This drawing may be eliminated if information may be put on the Site Plan. See Note (2) on the Site Plan Checklist.

SPR-1996-107
MS-1996-053

original letter returned 4/2/02 to bank (via LANDesign)

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

Irrevocable Standby Letter of Credit

May 14, 1996

Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attention: Michael T. Drollinger, Senior Planer

Re: IRREVOCABLE STANDBY LETTER OF CREDIT NO. S007/81695/96
FOR US$132,473.45 ISSUED BY THE BANK OF NOVA SCOTIA,
SAN FRANCISCO AGENCY

Gentlemen:

We hereby open our Irrevocable Standby Letter of Credit No. S007/81695/96 (the "Credit") in your favor for drawings up to the aggregate amount of U.S.$132,473.45 (U.S. One Hundred Thirty Two Thousand Four Hundred Seventy Three and 45/100 Dollars) effective immediately at our office at 580 California Street, 21st Floor, San Francisco, California 94104, for the account of Safeway Inc., 4th & Jackson Street, Oakland, California 94660.

We hereby undertake to honor your sight draft(s) drawn on us bearing upon its face the clause "Drawn under letter of credit No. S007/81695/96 dated May 14, 1996, accompanied by the following documents:

1. This Credit

2. A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway Inc has failed to complete the following improvements, as required by Site Plan Review in connection with the Safeway Project - SE Corner 29 Road and F Road.

The amount of each draft which is negotiated pursuant to this Credit, together with the date of negotiation, must be endorsed on the reverse side of the Credit.

We hereby agree with you that drafts drawn under and in compliance with the terms of this Credit will be duly honored by us if presented at this office or by registered mail on or before the expiration date of May 9, 1997 or any extended date, it being a condition of this Credit that it shall be automatically extended without written amendments for additional periods of Ninety (90) days from this or any future expiration date unless at least Thirty (30) days prior to such date we shall notify you in writing by certified mail at your above address that we elect not to renew this Credit for such additional period.

(This forms part of The Bank of Nova Scotia San Francisco Agency
Irrevocable Standby Letter of Credit No.S007/81695/96 for US$132,473.45)

Draft presentation before no later than 9.00 a.m. Pacific Standard Time on any business day shall be honored before 5.00 p.m. Pacific Standard Time on the same business day by wire transfer in immediately available funds to any account designated by you (or any other reasonable means specified by you). Draft presentation after 9.00 a.m. Pacific Standard Time and before 5.00 p.m. Pacific Standard Time, on any business day shall be honored on the following business day in immediately available funds to any account designated by you (or any other reasonable means specified by you). As used in this Credit, the term "business day" means a day other than Saturday, Sunday or any day in which banking institutions in the State of California are authorized or required by law to close.

This Credit may be amended to increase or decrease the amount that Beneficiary is entitled to draw hereunder if the Bank delivers (1) an amendment to this Credit to such effect or (ii) an Amended and Restated Irrevocable Letter of Credit in the form of this Credit and upon delivery of this Credit for cancellation.

This Credit is governed by the Uniform Customs and Practice for Documentary Credits, 1983 revision, ICC Publication No. 400. This Letter of Credit shall not be transferable and it shall be governed by the laws of the State of California.

I101

Authorized Signature

Authorized Signature C1403

KS5\LC-S007.96

FILE

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

May 15, 1996

John A. Quick
Scotiabank
101 California Street
48th Floor
San Francisco, CA 94111

RE: Letter of Credit - Safeway Cottonwood Centre
Grand Junction, Colorado

Dear Mr. Quick,

We have reviewed the draft letter of credit submitted for the Safeway project and offer the following comments and corrections:

1. The City requires that the letter of credit (LOC) be drawn on a local bank or minimally on an out of town bank which has a coordinate banking relationship with a local bank. This has been previously communicated to Safeway. The LOC in its present form would not meet the requirement.

2. If the cost of travel to San Francisco to collect the LOC is added to the Development Improvements Agreement as a separate line item or if Safeway guarantees that cost with cash, the present form of the proposed LOC is acceptable. If not, the LOC needs to be payable in Colorado as detailed in "1." above.

3. Regarding the content of the LOC:
   a) the LOC is addressed to me as a "planer", please correct to "planner"
   b) the dollar amount in the first paragraph is wrong;
   c) in the second paragraph, line 2, the phrases "the following" and "by site plan review" should be deleted.
   d) in the fourth paragraph, second line the phrase "at this office or by registered mail on or before" needs to be consistent with the banking relationship discussed above. In the same paragraph the expiration date of the LOC should be extended past the date of the improvements are to be completed (a minimum of 30 days).

As per our discussion, I would suggest that you wait until the final version of the Development Improvements Agreement is approved by the City which will contain the final number to be used in the LOC.

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

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: John Shaver, Assistant City Attorney
Mike Wein, Safeway

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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

May 16, 1996

Mike Wein
Safeway Inc.
6900 S. Yosemite
Englewood CO 80112-1412

RE: Safeway Project - SE Corner 29 Road and F Road

Dear Mr. Wein:

Enclosed please find a copy of a set of review agency comments for the Safeway project which were also forwarded to LANDesign (only LANDesign received the red-lined drawings and attachments referenced in the review comments). As noted in a previous letter, you now have 30 days in which to respond to the review comments. If an extension to this response period is desired it must be requested in writing. Following the submittal of a response to review comments, we will review the revised plans and make a final decision to approve, approve with conditions, or deny the application. You will be notified of a decision of denial within 5 working days after submitting the response to comments. An appeal of any decision shall be assigned to the Planning Commission.

As stated in previous correspondence, site work of any type is not permitted prior to the approval of development plans and issuance of a Planning Clearance by our office. A pre-construction meeting with the City Engineering Department is also required prior to commencement of the construction of public improvements. The plat and all associated documentation must also be recorded prior to the issuance of a Planning Clearance. As a reminder, all public improvements must be guaranteed prior to issuance of a Planning Clearance and prior to platting.

Please do not hesitate to contact me should you have any questions or if you require further clarification of any item.

Sincerely yours,

Michael T. Drollinger
Senior Planner

cc: Monty Stroup, LANDesign
Gary Harrison, Concepts West Architects (via FAX)

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DAVID M. SCANGA
Post Office Box 40
Grand Junction, Colorado 81502
(970) 242-4903

May 17, 1996

Michael T. Drollinger, AICP
Senior Planner
City of Grand Junction
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501

Re: Safeway Cottonwood Center

Dear Mike:

The Cris Mar Homeowners Association desires to be informed if at any time a final decision is made approving the site plan it has submitted for the Safeway Cottonwood Center. Based on our discussions, it would seem that the Cris Mar Homeowners Association would want to appeal any decision that is made that would approve the Safeway Cottonwood Center site plan.

Sincerely,

DAVID M. SCANGA

DMS:sld

Salinity Program Coordination Office

PALISADE AND MESA COUNTY IRRIGATION DISTRICTS

777 - 35.3 Road Palisade, Colorado 81526 Phone (303) 464-5113

May 21, 1996

Monte Stroup
Landesign
259 Grand Ave
Grand Junction, CO 81501

RE: Proposed Safeway Store #1533 located at 29 and F Road.

Dear Monte:

This letter is to inform you and your client, Safeway Inc. that we have removed the two concrete irrigation boxes that were located on the property owned by Walter K. Waymeyer as you requested.

If you have any questions please call me at 464-5113.

Sincerely,

Thomas G. Fowlds

Thomas G. Fowlds
Project Engineer

Lincoln DeVore, Inc.
Geotechnical Consultants
1441 Motor St.
Grand Junction, CO 81505
TEL: (970) 242-8968
FAX: (970) 242-1561

May 24, 1996

Safeway Inc.
6900 S. Yosemite
Englewood, CO 80112

RE: Proposed Pavement Section, Safeway Store #1533
29 & Patterson Roads, Grand Junction, Colorado

At the request of Mr. Monty Stroup of LANDesign Inc., the proposed road sections adjacent to the proposed Safeway Store #1533 was sampled by personnel of Lincoln DeVore Inc.. The samples were subjected to Laboratory Testing and appropriate road sections were computed. This information was originally provided to LANDesign Inc., and included with the site development documents. Following are our findings and recommendations.

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

AASHTO Classification - A-4(8) Unified Classification - ML-CL
Soil Type #1

R =	18
Expansion @ 300 psi =	0.3 psf
Displacement @ 300 psi =	5.41

Displacement values higher than 4.00 generally indicate the soil is unstable and may require confinement for proper performance.

Traffic Counts and volumes have been taken from a traffic study by Felsburg, Holt and Ullevig. The traffic volumes for the ADT assumptions are taken from the 2015 PM Peak Hour Total Traffic Volumes, Figure 8 of the Felsburg, Holt and Ullevig study. Truck mixture estimates for the proposed delivery areas for this Safeway project and the normal use of 29 & F Roads have been considered.

Two methods of design were utilized for this project. First, the 1986 AASHTO procedure, recognized by the Colorado Department of Transportation and second, The Asphalt Institute (MS-1).

Based upon the existing topography, the anticipated final road grades and subsurface soils conditions encountered during the drilling program, a Drainage Factor of 0.7 (1986 AASHTO procedure) and a mean average annual air temperature (MAAT) of 60° Fahrenheit (Asphalt Institute Method) has been utilized for the section analysis.

Calculated Pavement Sections

29 Road Full Traffic Lane

18K EAL = 77 Soil "R" Value = 18

	1986 AASHTO Drainage Coefficient = 0.7	Asphalt Institute MAAT = 60° F	
AC	4"	4"	AC
ABC	12"	12"	ABC
	Geotextile Fabric For Separation	Geotextile Fabric For Separation	

Patterson Road Turning Lane Only

18K EAL = 23 Soil "R" Value = 18

	1986 AASHTO Drainage Coefficient = 0.7	Asphalt Institute MAAT = 60° F	
AC	4"	4"	AC
ABC	8"	6"	ABC
	Geotextile Fabric For Separation	Geotextile Fabric For Separation	

The above pavement sections assume the subgrade does not show signs of significant instability and can be properly compacted. The Geotextile Fabric for Separation may be either woven with a minimum grab strength of 180 lbs. in the weakest direction (such as Mirafi 500-X) or a non-woven needle punched with a minimum grab strength of 110 lbs., in the weakest direction (such as Mirafi 140-N). In general, the woven fabric is recommended for general use if free water is not present, due to its higher strength and better performance. The unwoven fabric is generally preferred if free water is encountered.

Any areas of fill or subgrade instability encountered during construction are to be immediately brought to the attention of the Geotechnical Engineer, so recommendations for stabilization can be given.

PAVEMENT SECTION CONSTRUCTION

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

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

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

Respectfully Submitted,

LINCOLN DeVORE, Inc.

COLORADO REGISTERED EDWARD M. MORRIS 30590 5-24-96 PROFESSIONAL ENGINEER

by: Edward M. Morris PE
Engineer/Western Slope Manager

LD Job No.: 85113-J

FINAL DRAINAGE REPORT

FOR

SAFEWAY COTTONWOOD CENTRE

May 24, 1996

Date?

Prepared For:

SAFEWAY Inc.
6900 S. Yosemite
Englewood, CO 80112-1412
(303) 843-7600

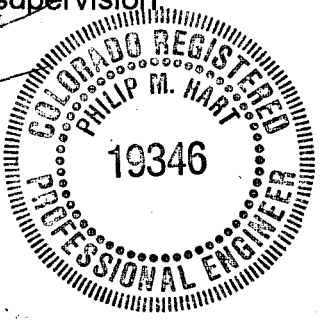
Prepared By:

LANDesign LLC.
259 Grand Avenue
Grand Junction, CO. 81501
(970) 245-4099

Prepared by: _____
Monty D. Stroup

" I hereby certify that this report for the preliminary drainage design of Safeway Cottonwood Centre was prepared under my direct supervision."

Reviewed by: _____
Philip M. Hart, PE
State of Colorado, #19346



I. Location and Description of Property

A. Property Location:

The Safeway Cottonwood Centre is located in the City of Grand Junction, County of Mesa, State of Colorado, more particularly being located in the NW1/4, NW1/4 of Section 8, T.1 S., R.1 E. of the Ute Meridian.

Existing streets within the area of the project include 29 Road which runs north to south and defines the west boundary of the project site. F Road running west to east defines the north boundary of the site. Primary access to the site shall be provided by both 29 Road and F Road.

The Safeway Cottonwood Centre is bounded to the north by F Road with a small retail facility and medium density single family developments beyond. To the east lies a undeveloped parcel of ground with Redwing Subdivision, a medium density single family development beyond. To the south lies large single family residential tracts. To the west is 29 Road with Indian Wash beyond.

B. Description of Property:

The Safeway Cottonwood Centre property contains approximately 10.63 acres and is planned for the central Safeway facility and 4 additional retail lots.

The site is currently vacant of any structures and is in fallow state. Recent agricultural production has not occurred on the property.

Topography of the site is considered flat in nature. The property slopes from the northwest to the southeast at an average rate of 1.10%. Runoff from the site is currently intercepted at the south east corner of the property by a large drainage known as the "Hans Drain".

Existing ground cover includes sparse native grasses, thick pockets of brush, Cottonwood trees and Russian Olive trees.

As the Hans Drain is maintained on a annual basis, wetlands areas are not apparent.

The site soils are classified as (Re) Ravola loam, 0 to 2 percent slopes and (Ra) Ravola clay loam, 0 to 2 percent slope. Both soils fall within the hydrological soil group "B", (Reference 3, Exhibit 1.0).

Irrigation facilities shall include a pressurized under ground system supplied by domestic water. Use of domestic water shall be metered.

II. Drainage Basins and Sub-Basins

A. Major Basin Description:

The Safeway Cottonwood Centre is bounded to the north and the west by F Road and 29 Road respectively. The existing improvements to the roadways cutoff drainage from offsite areas to the north and west.

The east portion of the project site is bisected by the Hans Drain flowing from the north to the south. The headwaters of the drain originate at F Road. The drain serves to convey return irrigation water and ground water south from the site and is owned and maintained by the Grand Junction Drainage District.

As defined on the "Flood Insurance Rate Map, FIRM, (Reference 2, Exhibit 2.0 thru 2.2) the entire site is in "Zone X" and is not within the 100 and 500 year floodplains of Indian Wash to the west.

B. Sub-Basin Description:

Historically the property drains in a overland sheetflow fashion from the northwest to the southeast at slopes averaging 1 percent towards an drainage know as the "Hans Drain". Drainage within the Hans Drain is ultimately conveyed under the Grand Valley Canal and is ultimately discharged to the Fruitvale Drain as shown on Exhibit 3.0.

III. Drainage Design Criteria

A. Regulations:

The City of Grand Junction's (SWMM), (Reference 1) was used as the basis for analysis and facility design.

The Grand Junction Drainage District's standards and specifications shall be used in the design and construction of the proposed relocation of the Hans Drain.

B. Development Criteria Reference and Constraints:

The Hans Drain is to be relocated towards the east property line and is to be tiled per Grand Junction Drain District's standards. Developed stormwater release rates to the drain shall be maintained at historic rates

C. Hydrological Criteria:

Since the project is a retail sales development containing approximately 10.63 acres the "Rational Method" is to be used to calculate developed flow rates. The minor storm

is the 2 year frequency rainfall event and the major storm is the 100 year frequency rainfall event. The major storm shall be used to analyze all conveyance elements.

Runoff Coefficients to be used in the computations are based on the most recent City of Grand Junction criteria as defined in Reference 1 and shown on Exhibit 4.0. Coefficients to be used in the calculations were assigned based on land use and hydrological soils groups "B".

The Intensity Duration Frequency Table (IDF) shown on Exhibit 5.0 is to be used for design and analysis.

Times of Concentration will be calculated based on the Average Velocities For Overland Flow and the Overland Flow Graph as provided in Reference 1 and shown on Exhibit 6.0.

D. Hydraulic Criteria:

Minimum standards for analysis and design of drainage facilities are based on the City of Grand Junction criteria (Reference 1).

IV. Drainage Facility Design:

A. General Concept:

Based on the proposed land use plan, significant changes to the existing drainage patterns are not anticipated. The proposed drainage patterns shall continue to direct runoff from the developed sub-basins to a proposed detention pond located in the southeast corner of the site. From the detention pond historic flow rates shall be discharged to the Hans Drain. Historic drainage basins are represented on the "Historic Basin Map " located in the back of this report.

B. Specific Details:

The propose plan divides the site into 13 sub-basins, A1 thru A4 and B1 thru B9. Proposed drainage basins are represented on the "Developed Basins Map" located in the back of this report.

Flow from sub-basins A1 thru A2 will be directed to Storm Sewer Line "A" and are subsequently conveyed to a proposed detention pond located at the southeast corner of the site. All inlets along this storm sewer are to be single combination inlets operating under sump conditions. A detailed hydraulic analysis was completed on the system the results of which are shown on Exhibits 30.0 thru 36.0. The calculated hydraulic grade lines are based on a maximum regulated water surface elevation at the detention pond for the 2 year and the 100 year storm events. The pipe is sized to limit the backwater depth or ponding depth during the 100 year storm event to 18-inches

maximum in the parking areas. A minimum freeboard of 1-foot is provided between maximum water surface elevations and finish floor elevations during the 100 year storm event.

Flow from sub-basins B1 thru B9 will be directed to Storm Sewer Line "B" and are subsequently conveyed to a proposed detention pond located at the southeast corner of the site. All inlets along this storm sewer are to be single combination inlets operating under sump conditions. A detailed hydraulic analysis was completed on the system the results of which are shown on Exhibits 37.0 thru 43.0. The calculated hydraulic grade lines are based on a maximum regulated water surface elevation at the detention pond for the 2 year and the 100 year storm events. The pipe is sized to limit the backwater depth or ponding depth during the 100 year storm event to 18-inches maximum in the parking areas. A minimum freeboard of 1-foot is provided between maximum water surface elevations and finish floor elevations during the 100 year storm event.

The required detention pond storage pond volumes for the 2 year and 100 year storm events are calculated on Exhibit 44.0. A detailed detention pond analysis calculating pond volumes and outlet works characteristics is presented on Exhibits 45.0 thru 48.0.

IV. Conclusion

All flow from the site will be directed to the proposed detention pond during construction. The flows are to be retained within the pond until the parking areas have been stabilized with base coarse material and are prepared for asphalt. The connection to the HANs Drain will be made at that time. Due to the retention of runoff during construction the requirement for a Storm Water Management Permit is considered mitigated. Stormwater management BMP's consist of the installation of Hay Bail barriers around undeveloped pads. These are shown on the construction plans.

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

V. References

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

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

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

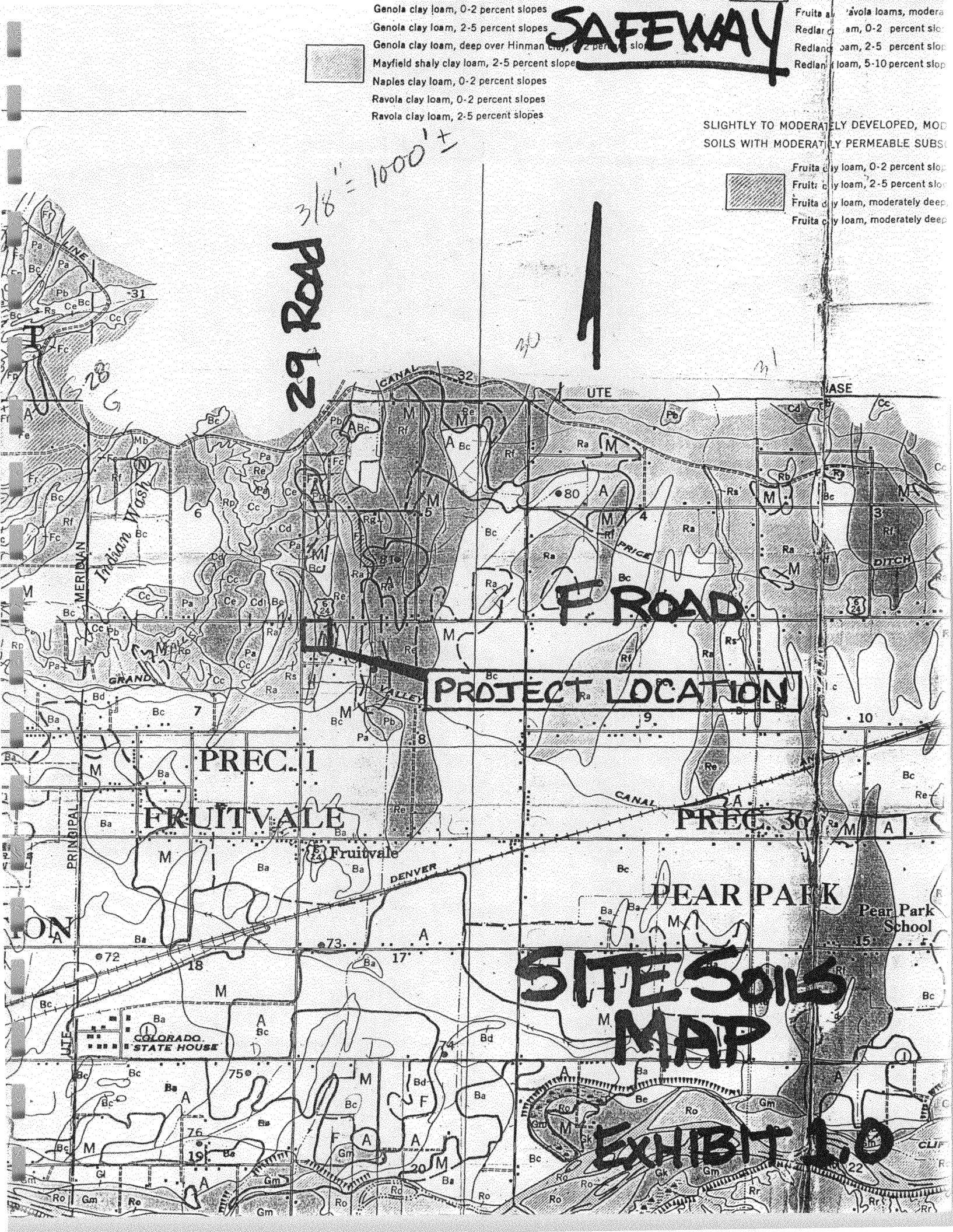
4. Urban Storm Drainage Criteria Manual, Urban Drainage and Flood Control District, prepared by Wright-McLaughlin Engineers, March 1969, Revised May, 1984.

5. Concrete Pipe Design Manual, American Concrete Pipe Association, Fifth Printing (revised) June, 1980.

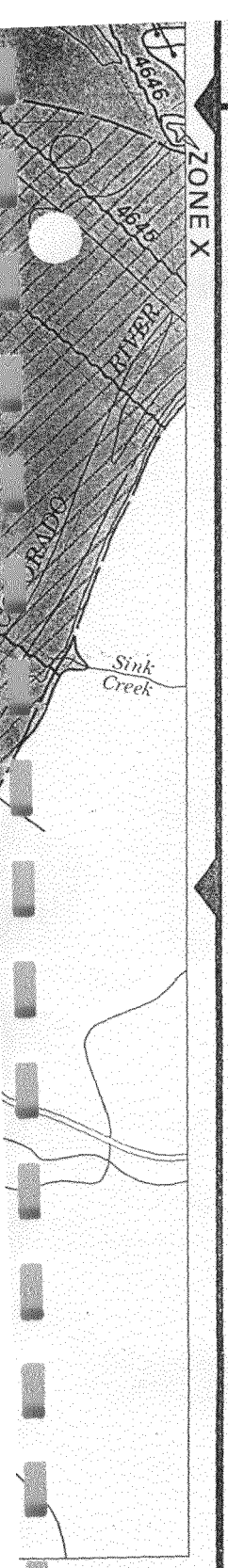
6. Flowmaster I, Version 3.16, Haestad Methods, Inc., Copyright 1990.

APPENDIX

APPENDIX


Genola clay loam, 0-2 percent slopes
Genola clay loam, 2-5 percent slopes
Genola clay loam, deep over Hinman clay, 0-2 percent slopes
Mayfield shaly clay loam, 2-5 percent slopes
Naples clay loam, 0-2 percent slopes
Ravola clay loam, 0-2 percent slopes
Ravola clay loam, 2-5 percent slopes
SAFEWAY
Fruita a avola loams, modera
Redlar am, 0-2 percent slo
Redlanc oam, 2-5 percent slop
Redlan loam, 5-10 percent slop
SLIGHTLY TO MODERATELY DEVELOPED, MOD
SOILS WITH MODERATELY PERMEABLE SUBS
Fruita y loam, 0-2 percent slop
Fruita y loam, 2-5 percent slo
Fruita y loam, moderately deep
Fruita y loam, moderately deep
1" = 1000' ±
29 Road
F ROAD
PROJECT LOCATION
PREC. 1
FRUITVALE
PREC. 30
PEAR PARK
Pear Park School
Fruitvale
SITE SOILS MAP
EXHIBIT 1.0
Indian Wash
MERIDIAN
PRINCIPAL
GRAND VALLEY
PRICE DITCH
CANAL
DENVER
UTE
COLORADO STATE HOUSE

1000 0 1000

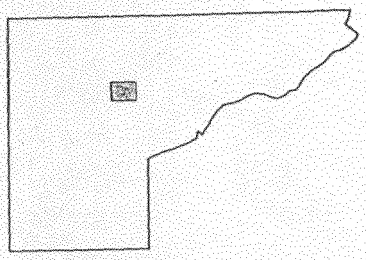


NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MESA COUNTY,
COLORADO
(UNINCORPORATED AREAS)

PANEL 480 OF 1000
(SEE MAP INDEX FOR PANELS NOT PRINTED)



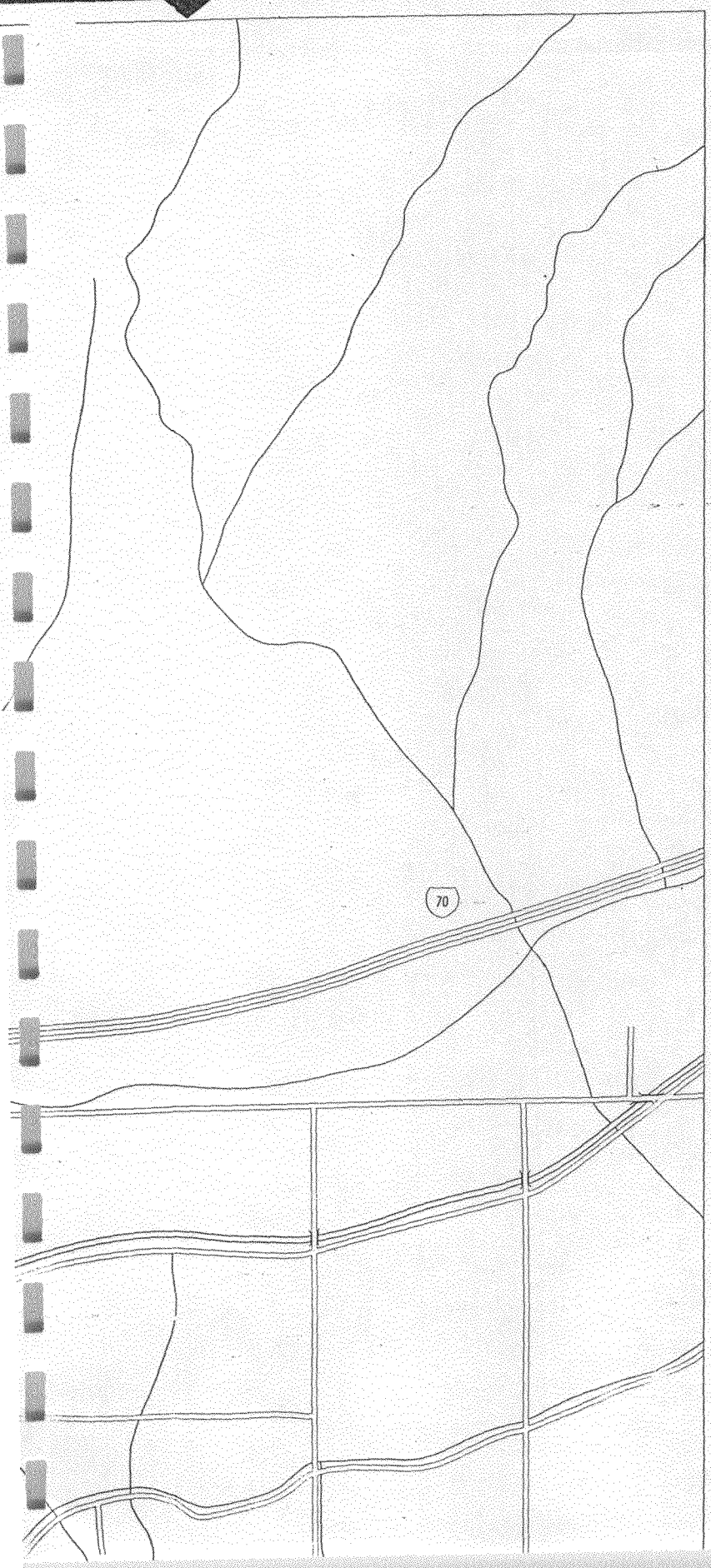
PANEL LOCATION

COMMUNITY-PANEL NUMBER
080115 0480 C

MAP REVISED:
JULY 15, 1992

Federal Emergency Management Agency

EXHIBIT 2.0



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE A99	To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
ZONE V	Coastal flood with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X	Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X	Areas determined to be outside 500-year flood plain.
ZONE D	Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

D — D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

$RM7_X$ — Elevation Reference Mark

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

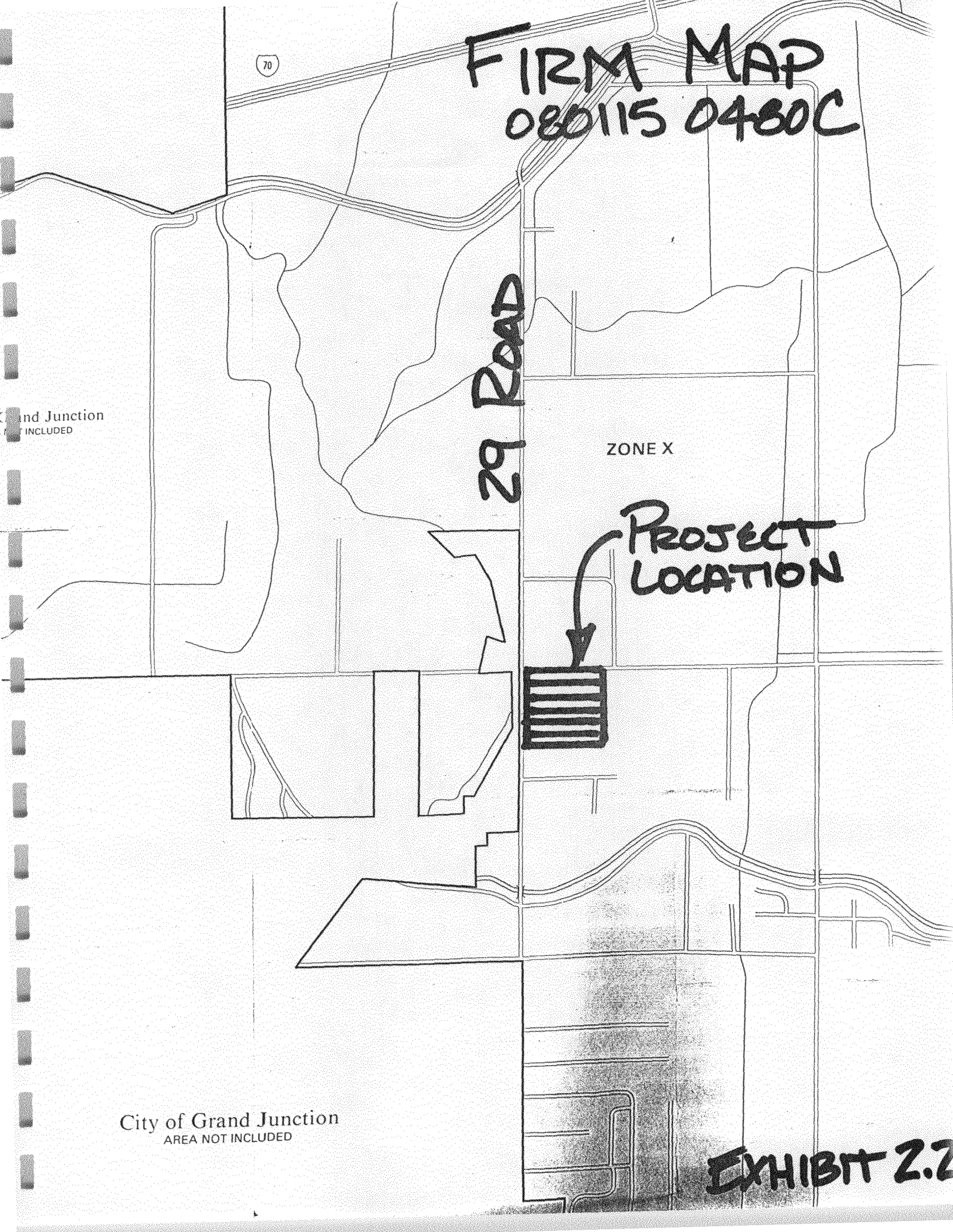
This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Areas of special flood hazard (100-year flood) include Zones A, A1-30, AE, AH, AO, A99, V, V1-30 AND VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

EXHIBIT 21


FIRM MAP
080115 0480C
70
22 Road
ZONE X
PROJECT LOCATION
nd Junction
INCLUDED
City of Grand Junction
AREA NOT INCLUDED
EXHIBIT 2.2

SAFEWAY COTTONWOOD CENTRE

"OFFSITE DRAINAGE FACILITIES"

Prepared By:
LANDesign LLC

EXHIBIT 3.0

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

EXHIBIT 4.0

Rainfall Table

Return Periods		
Durations	2 year	100 year
5 min	1.95	4.95
6 min	1.83	4.65
7 min	1.74	4.40
8 min	1.66	4.19
9 min	1.59	3.99
10 min	1.52	3.80
11 min	1.46	3.66
12 min	1.41	3.54
13 min	1.36	3.43
14 min	1.32	3.33
15 min	1.28	3.24
16 min	1.24	3.15
17 min	1.21	3.07
18 min	1.17	2.99
19 min	1.14	2.91
20 min	1.11	2.84
21 min	1.08	2.77
22 min	1.05	2.70
23 min	1.02	2.63
24 min	1.00	2.57
25 min	0.98	2.51
26 min	0.96	2.46
27 min	0.94	2.41
28 min	0.92	2.36
29 min	0.90	2.31
30 min	0.88	2.27
31 min	0.86	2.23
32 min	0.84	2.19
33 min	0.83	2.15
34 min	0.82	2.12
35 min	0.81	2.09
36 min	0.80	2.06
37 min	0.79	2.03
38 min	0.78	2.00
39 min	0.77	1.97
40 min	0.76	1.94
41 min	0.75	1.91
42 min	0.74	1.88
43 min	0.73	1.85
44 min	0.72	1.82
45 min	0.71	1.79

EXHIBIT 4.1

Rainfall Table

Return Periods		
Durations	2 year	100 year
46 min	0.70	1.76
47 min	0.69	1.73
48 min	0.68	1.70
49 min	0.67	1.67
50 min	0.66	1.64
51 min	0.65	1.61
52 min	0.64	1.59
53 min	0.63	1.57
54 min	0.62	1.55
55 min	0.61	1.53
56 min	0.60	1.51
57 min	0.59	1.49
58 min	0.58	1.47
59 min	0.57	1.45
60 min	0.56	1.43

Rainfall Intensities are in (in/hr)

LANDESIGN
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

EXHIBIT 4.2

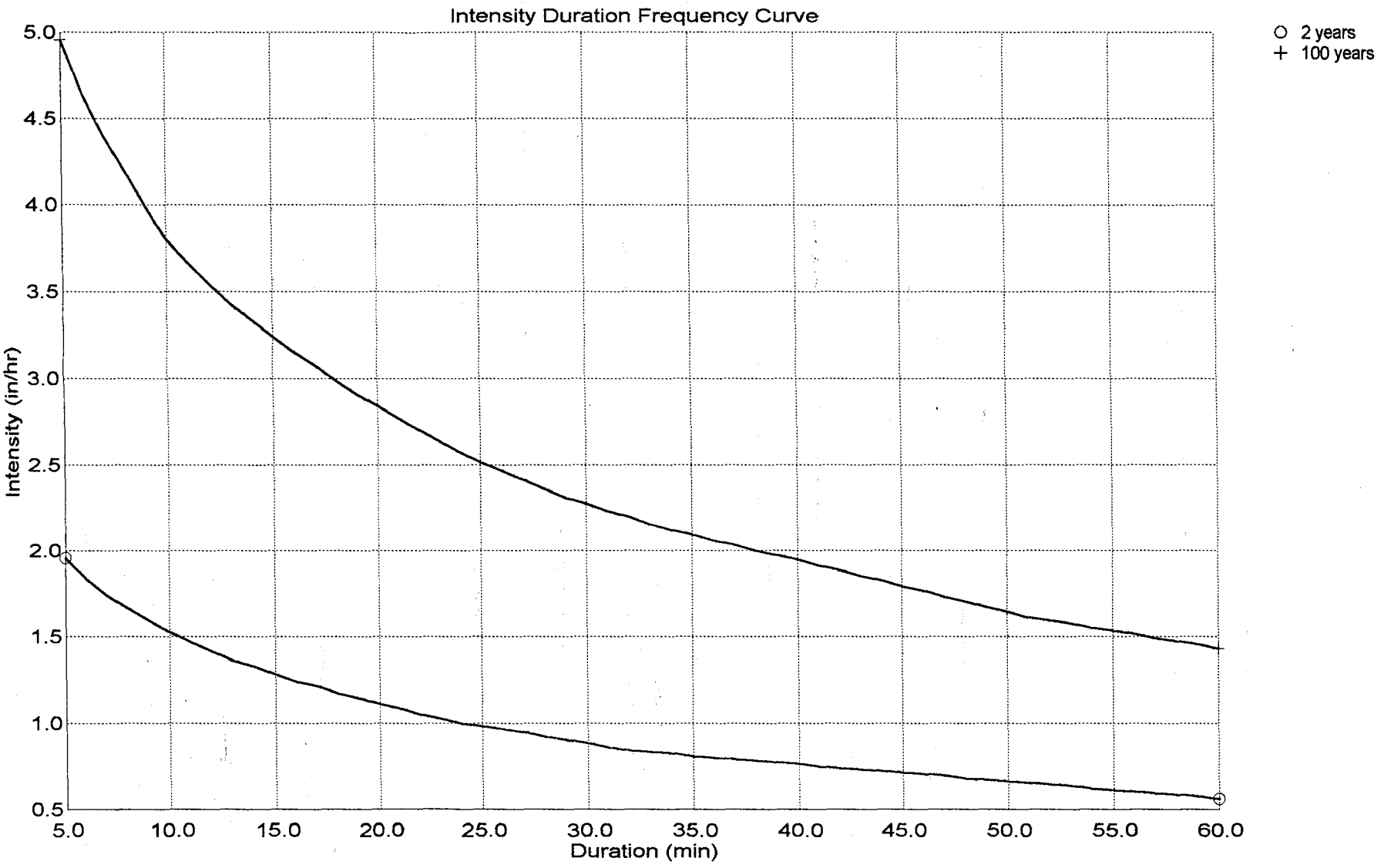


EXHIBIT 4.3

Project Title: SAFEWAY COTTONWOOD CENTRE
c:\haestad\stmc\safeway1.stm
04/12/96 01:35:22 PM

LANDESIGN

 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0

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

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

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

TABLE "B-1"

EXHIBIT 50

DATE: 15-Apr-96
PROJECT: **SAFEWAY COTTONWOOD CENTRE**
SUBJECT: **FINAL DRAINAGE STUDY**
BASIN I.D.: **A1 DEVELOPED**
HYDROLOGIC SOILS GROUP **"B"**

COMPOSITE 2 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.76	0.93	0.71
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.21	0.22	0.05
SUBTOTALS	0.97		0.75

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{0.75}{0.97} =$ **0.78**

COMPOSITE 100 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.76	0.95	0.72
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.21	0.28	0.06
SUBTOTALS	0.97		0.78

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{0.78}{0.97} =$ **0.80**

EXHIBIT 5.1

DATE: 15-Apr-96
PROJECT: **SAFEWAY COTTONWOOD CENTRE**
SUBJECT: **FINAL DRAINAGE STUDY**
BASIN I.D.: **A3 DEVELOPED**
HYDROLOGIC SOILS GROUP **"B"**

COMPOSITE 2 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	1.36	0.93	1.26
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.14	0.22	0.03
SUBTOTALS	1.50		1.30

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{1.30}{1.50} =$ **0.86**

COMPOSITE 100 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	1.36	0.95	1.29
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.14	0.28	0.04
SUBTOTALS	1.50		1.33

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{1.33}{1.50} =$ **0.89**

EXHIBIT 5.2

DATE: 15-Apr-96
PROJECT: **SAFEWAY COTTONWOOD CENTRE**
SUBJECT: **FINAL DRAINAGE STUDY**
BASIN I.D.: **B1 DEVELOPED**
HYDROLOGIC SOILS GROUP **"B"**

COMPOSITE 2 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	1.14	0.93	1.06
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.33	0.22	0.07
SUBTOTALS	1.47		1.13

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{1.13}{1.47} =$ **0.77**

COMPOSITE 100 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	1.14	0.95	1.08
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.33	0.28	0.09
SUBTOTALS	1.47		1.18

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{1.18}{1.47} =$ **0.80**

EXHIBIT 5.3

DATE: 15-Apr-96
PROJECT: **SAFEWAY COTTONWOOD CENTRE**
SUBJECT: **FINAL DRAINAGE STUDY**
BASIN I.D.: **B3 DEVELOPED**
HYDROLOGIC SOILS GROUP **"B"**

COMPOSITE 2 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.99	0.93	0.92
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.39	0.22	0.09
SUBTOTALS	1.38		1.01

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{1.01}{1.38} =$ **0.73**

COMPOSITE 100 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.99	0.95	0.94
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.39	0.40	0.16
SUBTOTALS	1.38		1.10

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{1.10}{1.38} =$ **0.79**

EXHIBIT 5.4

DATE: 15-Apr-96
PROJECT: **SAFEWAY COTTONWOOD CENTRE**
SUBJECT: **FINAL DRAINAGE STUDY**
BASIN I.D.: **B4 DEVELOPED**
HYDROLOGIC SOILS GROUP **"B"**

COMPOSITE 2 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.24	0.93	0.22
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.05	0.22	0.01
SUBTOTALS	0.29		0.23

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{0.23}{0.29} =$ **0.81**

COMPOSITE 100 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.24	0.95	0.23
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.05	0.40	0.02
SUBTOTALS	0.29		0.25

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{0.25}{0.29} =$ **0.86**

EXHIBIT 5.5

DATE: 15-Apr-96
PROJECT: **SAFEWAY COTTONWOOD CENTRE**
SUBJECT: **FINAL DRAINAGE STUDY**
BASIN I.D.: **B5 DEVELOPED**
HYDROLOGIC SOILS GROUP **"B"**

COMPOSITE 2 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.55	0.93	0.51
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.05	0.22	0.01
SUBTOTALS	0.60		0.52

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{0.52}{0.60} =$ **0.87**

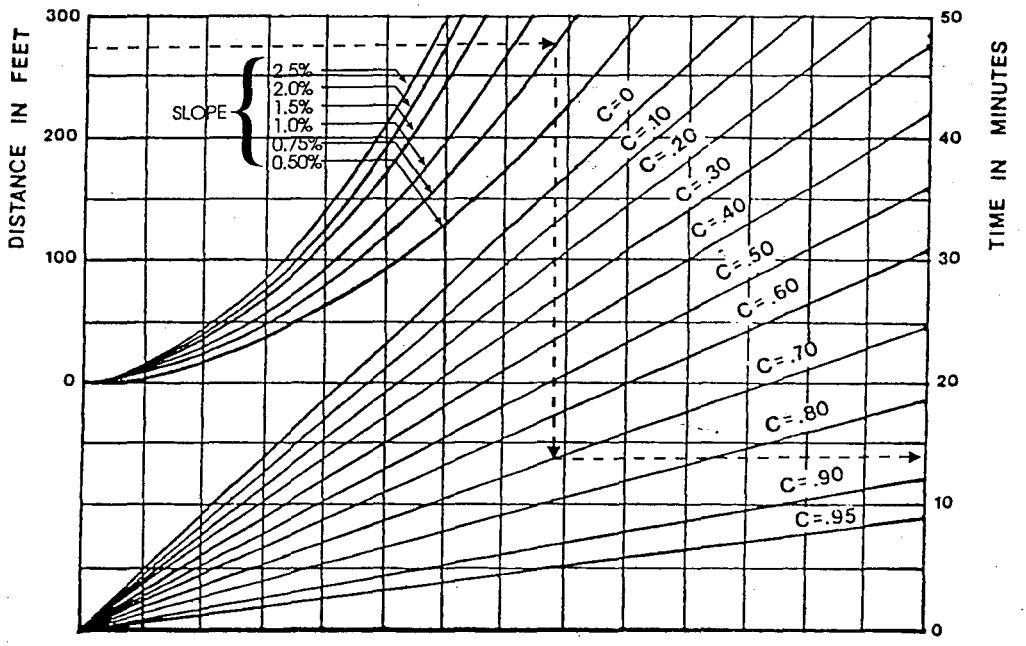
COMPOSITE 100 YEAR "C" VALUE

DESCRIPTION	AREA AC.	"C"	"C" x "A"
IMPERVIOUS SURFACES			
- Asphalt parking spaces & driveways			
- Conc. sidewalks excluding R.O.W.			
- Dedicated R.O.W. improvements	0.55	0.95	0.52
PERVIOUS SURFACES			
- Grass and Landscape Areas	0.05	0.40	0.02
SUBTOTALS	0.60		0.54

COMPOSITE = $\frac{\text{"C" x "A"}}{\text{"A"}} = \frac{0.54}{0.60} =$ **0.90**

EXHIBIT 5.6

MODIFIED FROM FIGURE 403, MESA COUNTY



THE ABOVE CURVES ARE A SOLUTION OF THE FOLLOWING EQUATION:

$$To = \frac{1.8\ (1.1 - C)\sqrt{L}}{\sqrt[3]{S}}$$

WHERE: To = OVERLAND FLOW TIME (MIN.)
S = SLOPE OF BASIN (%)
C = RUNOFF COEFFICIENT (SEE TABLE "B-1" IN APPENDIX "B")
L = LENGTH OF BASIN (ft)

EXHIBIT 6.0

GRAPHICAL DETERMINATION OF "To:" FAA METHOD	FIGURE "E-2"

REPRODUCED FROM FIGURE 15.2, SCS 1972

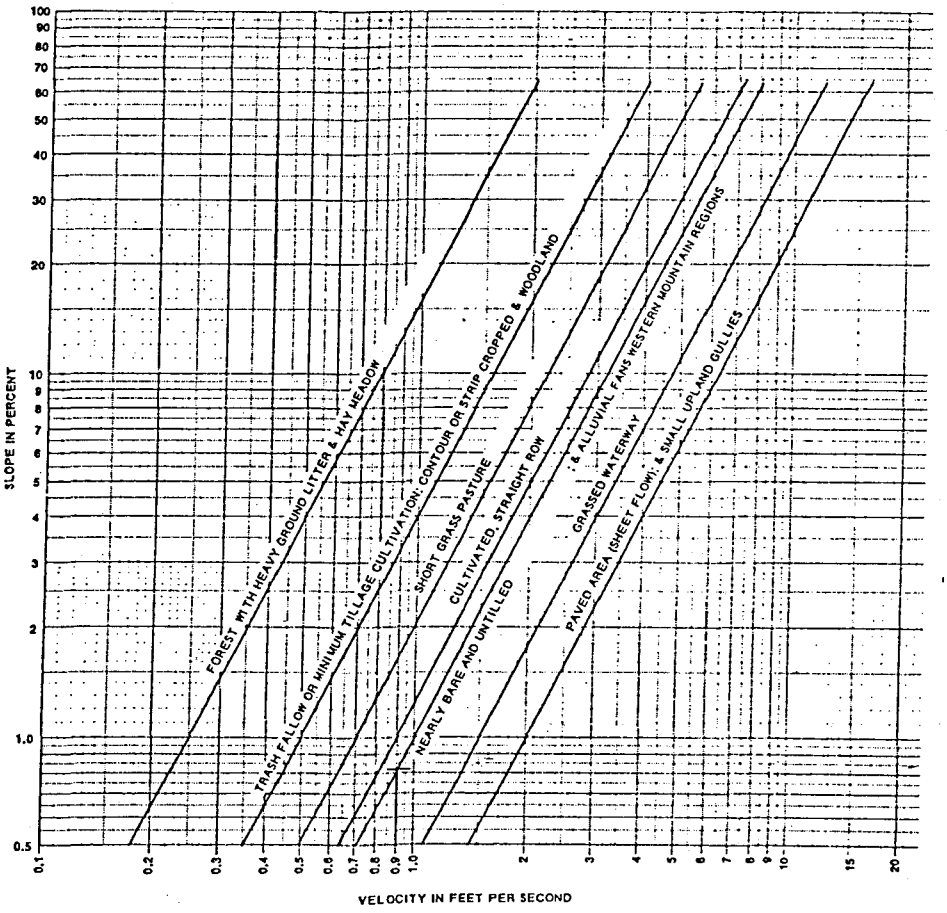


EXHIBIT 7.0

DETERMINATION OF "Ts"	FIGURE "E-3"

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN A1 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN A1 (FOR Tc)

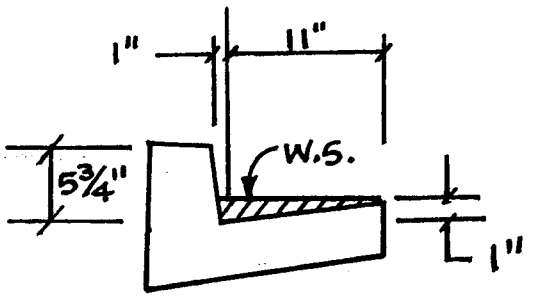
Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0094 ft/ft — 2 AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.07 fps — USE FOR TC CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0107 ft/ft
Froude Number....	0.94 (flow is Subcritical)



TYPICAL FLOW IN CURB & GUTTER

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EXHIBIT 8.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN A2 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN A2 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 ——— CONCRETE
Channel Slope....	0.0152 ft/ft ∠ AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.05 cfs
Velocity.....	1.36 fps ——— USE FOR T_c CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.09 ft
Critical Slope...	0.0104 ft/ft
Froude Number....	1.20 (flow is Supercritical)

EXHIBIT 9.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN A3 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN A3 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0119 ft/ft — 2 AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.20 fps — USE FOR T_c CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0105 ft/ft
Froude Number....	1.06 (flow is Supercritical)

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EXHIBIT 10.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN A4 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN A4 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0106 ft/ft 2 AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.13 fps — USE FOR Tc CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0106 ft/ft
Froude Number....	1.00 (flow is Critical)

EXHIBIT 11.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN B1 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN B1 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0202 ft/ft — 2 AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.06 cfs
Velocity.....	1.56 fps — USE FOR Tc CALC.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.09 ft
Critical Slope...	0.0102 ft/ft
Froude Number....	1.38 (flow is Supercritical)

EXHIBIT 12.0

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: BASIN B2 PIPE DRAIN

Comment: 3" PVC DRAIN FROM BLG. SUB-BASIN B2 (FOR TC)

Solve For Actual Discharge

Given Input Data:

Diameter.....	0.25 ft — 3"
Slope.....	0.0158 ft/ft
Manning's n.....	0.011 — PVC
Depth.....	0.25 ft

Computed Results:

Discharge.....	0.13 cfs
Velocity.....	2.67 fps — USE FOR T_c CALCS.
Flow Area.....	0.05 sf
Critical Depth....	0.22 ft
Critical Slope....	0.0145 ft/ft
Percent Full.....	100.00 %
Full Capacity.....	0.13 cfs
QMAX @.94D.....	0.14 cfs
Froude Number.....	FULL

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EXHIBIT 13.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Wc Worksheet Name: BASIN B3 C & G

Cc Comment: CURB & GUTTER FLOW SUB-BASIN B3 (FOR Tc)

Sc Solve For Discharge

Gi Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0107 ft/ft — 2 AVG. SLOPE
Depth.....	0.08 ft

Cc Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.14 fps — USE FOR Tc CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0106 ft/ft
Froude Number....	1.00 (flow is Critical)

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EXHIBIT 14.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN B5 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN B5 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0100 ft/ft — 2 AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.10 fps — USE FOR Tc CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0107 ft/ft
Froude Number....	0.97 (flow is Subcritical)

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EXHIBIT 16.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN B6 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN B6 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0083 ft/ft — AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.00 fps — USE FOR Tc CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0108 ft/ft
Froude Number....	0.88 (flow is Subcritical)

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EXHIBIT 17.0

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: BASIN B7 PIPE DRAIN

Comment: 15" PVC DRAIN-BLG. SUB-BASIN B7 (FOR TC)

Solve For Actual Discharge

Given Input Data:

Diameter.....	1.25 ft
Slope.....	0.0155 ft/ft
Manning's n.....	0.011 — PVC
Depth.....	0.63 ft

Computed Results:

Discharge.....	4.82 cfs
Velocity.....	7.77 fps — USE FOR Tc CALCS.
Flow Area.....	0.62 sf
Critical Depth....	0.89 ft
Critical Slope....	0.0054 ft/ft
Percent Full.....	50.40 %
Full Capacity.....	9.50 cfs
QMAX @.94D.....	10.22 cfs
Froude Number.....	1.94 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

EXHIBIT 18.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN B8 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN B8 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0185 ft/ft — 2 AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.05 cfs
Velocity.....	1.50 fps — USE FOR Tc CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.09 ft
Critical Slope...	0.0102 ft/ft
Froude Number....	1.32 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

EXHIBIT 19.0

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BASIN B9 C & G

Comment: CURB & GUTTER FLOW SUB-BASIN B9 (FOR Tc)

Solve For Discharge

Given Input Data:

Left Side Slope..	0.17:1 (H:V)
Right Side Slope.	11.00:1 (H:V)
Manning's n.....	0.015 — CONCRETE
Channel Slope....	0.0084 ft/ft — AVG. SLOPE
Depth.....	0.08 ft

Computed Results:

Discharge.....	0.04 cfs
Velocity.....	1.01 fps — USE FOR Tc CALCS.
Flow Area.....	0.04 sf
Flow Top Width...	0.89 ft
Wetted Perimeter.	0.96 ft
Critical Depth...	0.08 ft
Critical Slope...	0.0108 ft/ft
Froude Number....	0.89 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

EXHIBIT 20.0

TIME OF CONCENTRATION CALCULATIONS **(2 YEAR STORM EVENT)**

PROJECT: SAFEWAY COTTONWOOD CENTRE (OVERLAND FLOW) DATE:
JOB # 95178 HISTORIC CONDITION 17-Apr-96
LANDesign LTD.

SUB-BASIN DATA			INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME TIME (Tt)				INITIAL	Tc CHECK (URBANIZED BASINS)		FINAL	REMARKS
BASIN	C 2	AREA AC.	LENGTH FT.	SLOPE %	Ti MIN.	LENGTH FT.	SLOPE %	VEL F.P.S.	Tt MIN.	Tc MIN.	TOTAL LENGTH FT.	Tc = (L/180)+10 MIN.	MIN.	
H1	0.22	11.33	300.0	2.00	21.78	520.0	0.83	0.90	9.63	31.41	820.00	14.56	31.41	OVERLAND SHEET FLOW UNDEVELOPED CONDITION NEAR BARE GROUND - UNTILLED TO HANS DRAIN
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---

FORMULAS

$$Ti = \frac{1.8(1.1-C)(L)^{1/2}}{S^{1/3}} \qquad Tt = \frac{(L)}{60\ \text{SEC/MIN.}\ (V\ \text{F.P.S.})}$$

TIME OF CONCENTRATION CALCULATIONS **(100 YEAR STORM EVENT)**

PROJECT: SAFEWAY COTTONWOOD CENTRE (OVERLAND FLOW) DATE:
JOB # 95178 HISTORIC CONDITION 17-Apr-96
LANDesign LTD.

SUB-BASIN DATA			INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME TIME (Tt)				INITIAL	Tc CHECK (URBANIZED BASINS)		FINAL	REMARKS
BASIN	C 100	AREA AC.	LENGTH FT.	SLOPE %	Ti MIN.	LENGTH FT.	SLOPE %	VEL F.P.S.	Tt MIN.	Tc MIN.	TOTAL LENGTH FT.	Tc = (L/180)+10 MIN.	MIN.	
H1	0.28	11.33	300.0	2.00	20.29	520.0	0.83	0.90	9.63	29.92	820.00	14.56	29.92	OVERLAND SHEET FLOW UNDEVELOPED CONDITION NEAR BARE GROUND - UNTILLED TO HANS DRAIN
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---

FORMULAS

$$Ti = \frac{1.8(1.1-C)(L)^{1/2}}{S^{1/3}} \qquad Tt = \frac{(L)}{60\ \text{SEC/MIN.}\ (V\ \text{F.P.S.})}$$

EXHIBIT 21.0

TIME OF CONCENTRATION CALCULATIONS **(2 YEAR STORM EVENT)**

PROJECT: SAFEWAY COTTONWOOD CENTRE
JOB # 95178
LANDesign LTD.

(OVERLAND, GUTTER AND PIPEFLOW)
DEVELOPED CONDITION

DATE:
17-Apr-96

SUB-BASIN DATA			INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME TIME (Tt)				INITIAL	Tc CHECK (URBANIZED BASINS)		FINAL	REMARKS
BASIN	C 2	AREA AC.	LENGTH FT.	SLOPE %	Ti MIN.	LENGTH FT.	SLOPE %	VEL F.P.S.	Tt MIN.	Tc MIN.	TOTAL LENGTH FT.	Tc = (L/180)+10 MIN.	MIN.	
A1	0.22	0.97	22.0	1.00	7.43									OVERLAND SHEET FLOW - LANDSCAPE AREA
						357.0	0.94	1.07	5.56	12.99	379.00	12.11	12.99	GUTTER FLOW TO INLET A1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
A2	0.93	1.11	36.0	2.00	1.46									SHEET FLOW - ASPHALT ON F ROAD
						604.0	1.52	1.36	7.40	8.86	640.00	13.56	8.86	GUTTER FLOW TO INLET A2
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
A3	0.22	1.50	34.0	2.60	6.72									OVERLAND SHEET FLOW - LANDSCAPE AREA
						43.5	2.00	2.80	0.26	6.98	77.50	10.43		SHEET FLOW - ASPHALT IN PARKING LOT
						209.0	1.19	1.20	2.90	9.88	286.50	11.59	9.88	GUTTER FLOW TO INLET A3
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
A4	0.22	0.38	5.0	1.00	3.54									OVERLAND SHEET FLOW - LANDSCAPE AREA
						194.0	1.06	1.13	2.86	6.40	199.00	11.11	6.40	GUTTER FLOW TO INLET A4
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---

FORMULAS

$$Ti = \frac{1.8(1.1-C)(L)^{1/2}}{S^{1/3}} \qquad Tt = \frac{(L)}{60 \text{ SEC/MIN. } (V \text{ F.P.S.})}$$

EXHIBIT 22.0

TIME OF CONCENTRATION CALCULATIONS

(2 YEAR STORM EVENT)

PROJECT: SAFEWAY COTTONWOOD CENTRE
JOB # 95178
LANDesign LTD.

(OVERLAND, GUTTER AND PIPEFLOW)
DEVELOPED CONDITION

DATE:
19-Apr-96

SUB-BASIN DATA			INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME TIME (Tt)				INITIAL	Tc CHECK (URBANIZED BASINS)		FINAL	REMARKS
BASIN	C 2	AREA AC.	LENGTH FT.	SLOPE %	Ti MIN.	LENGTH FT.	SLOPE %	VEL F.P.S.	Tt MIN.	Tc MIN.	TOTAL LENGTH FT.	Tc = (L/180)+10 MIN.	Tc MIN.	
B1	0.22	1.47	118.0	3.42	11.42									OVERLAND SHEET FLOW - LANDSCAPE AREA
						207.0	2.02	1.56	2.21	13.63	325.00	11.81	13.63	GUTTER FLOW TO INLET B1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B2	0.93	0.29	166.0	2.00	3.13									SHEET FLOW - ROOF OF SAFEWAY STORE
						51.0	1.58	2.67	0.32	3.45	217.00	11.21	5.00	3-INCH PIPE FLOW TO MH-STB1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B3	0.22	1.38	122.0	3.42	11.61									OVERLAND SHEET FLOW - LANDSCAPE AREA
						275.0	1.07	1.14	4.02	15.63	397.00	12.21	15.63	GUTTER FLOW TO INLET B3
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B4	0.93	0.29	37.0	2.50	1.37									SHEET FLOW - ASPHALT ON 29 ROAD
						134.0	1.04	1.12	1.99	3.37	171.00	10.95	5.00	GUTTER FLOW TO INLET B4
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B5	0.22	0.60	14.0	1.00	5.93									OVERLAND SHEET FLOW - LANDSCAPE AREA
						115.0	1.00	1.10	1.74	7.67	129.00	10.72	7.67	GUTTER FLOW TO INLET B5
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B6	0.22	0.88	13.0	1.00	5.71									OVERLAND SHEET FLOW - LANDSCAPE AREA
						334.0	0.83	1.00	5.57	11.28	347.00	11.93	11.28	GUTTER FLOW TO INLET B6
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B7	0.93	0.71	323.0	2.00	4.36									SHEET FLOW - ROOF OF SAFEWAY STORE
						54.0	1.55	7.77	0.12	4.48	377.00	12.09	5.00	15-INCH PIPE FLOW TO MH-STB6
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B8	0.93	0.24	40.0	2.70	1.39									SHEET FLOW - ASPHALT PARKING LOT
						171.0	1.85	1.50	1.90	3.29	211.00	11.17	5.00	GUTTER FLOW TO INLET B7
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B9	0.93	1.47	25.0	1.32	1.39									SHEET FLOW - ASPHALT PARKING LOT
						545.0	0.84	1.01	8.99	10.39	570.00	13.17	10.39	GUTTER FLOW TO INLET B8
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---

FORMULAS

$$Ti = \frac{1.8(1.1-C)(L)^{1/2}}{S^{1/3}} \qquad Tt = \frac{\text{_____}(L)\text{_____}}{60 \text{ SEC/MIN. (V F.P.S.)}}$$

EXHIBIT 23.0

TIME OF CONCENTRATION CALCULATIONS **(100 YEAR STORM EVENT)**

PROJECT: SAFEWAY COTTONWOOD CENTRE (OVERLAND, GUTTER AND PIPEFLOW) DATE:
JOB # 95178 DEVELOPED CONDITION 17-Apr-96
LANDesign LTD.

SUB-BASIN DATA			INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME TIME (Tt)				INITIAL	Tc CHECK (URBANIZED BASINS)		FINAL	REMARKS
BASIN	C 100	AREA AC.	LENGTH FT.	SLOPE %	Ti MIN.	LENGTH FT.	SLOPE %	VEL F.P.S.	Tt MIN.	Tc MIN.	TOTAL LENGTH FT.	Tc = (L/180)+10 MIN.	Tc MIN.	
A1	0.28	0.97	22.0	1.00	6.92									OVERLAND SHEET FLOW - LANDSCAPE AREA
						357.0	0.94	1.07	5.56	12.48	379.00	12.11	12.48	GUTTER FLOW TO INLET A1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
A2	0.95	1.11	36.0	2.00	1.29									SHEET FLOW - ASPHALT ON F ROAD
						604.0	1.52	1.36	7.40	8.69	640.00	13.56	8.69	GUTTER FLOW TO INLET A2
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
A3	0.28	1.50	34.0	2.60	6.26									OVERLAND SHEET FLOW - LANDSCAPE AREA
						43.5	2.00	2.80	0.26	6.52	77.50	10.43		SHEET FLOW - ASPHALT IN PARKING LOT
						209.0	1.19	1.20	2.90	9.42	286.50	11.59	9.42	GUTTER FLOW TO INLET A3
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
A4	0.28	0.38	5.0	1.00	3.30									OVERLAND SHEET FLOW - LANDSCAPE AREA
						194.0	1.06	1.13	2.86	6.16	199.00	11.11	6.16	GUTTER FLOW TO INLET A4
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---

FORMULAS

$$Ti = \frac{1.8(1.1-C)(L)^{1/2}}{S^{1/3}} \qquad Tt = \frac{(L)}{60 \text{ SEC/MIN. } (V \text{ F.P.S.})}$$

EXHIBIT 24.0

TIME OF CONCENTRATION CALCULATIONS **(100 YEAR STORM EVENT)**

PROJECT: SAFEWAY COTTONWOOD CENTRE (OVERLAND, GUTTER AND PIPEFLOW) DATE:
JOB # 95178 DEVELOPED CONDITION 19-Apr-96
LANDesign LTD.

SUB-BASIN DATA			INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME TIME (Tt)				INITIAL	Tc CHECK (URBANIZED BASINS)		FINAL	REMARKS
BASIN	C 100	AREA AC.	LENGTH FT.	SLOPE %	Ti MIN.	LENGTH FT.	SLOPE %	VEL F.P.S.	Tt MIN.	Tc MIN.	TOTAL LENGTH FT.	Tc = (L/180)+10 MIN.	Tc MIN.	
B1	0.28	1.47	118.0	3.42	10.64									OVERLAND SHEET FLOW - LANDSCAPE AREA
						207.0	2.02	1.56	2.21	12.85	325.00	11.81	12.85	GUTTER FLOW TO INLET B1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B2	0.95	0.29	166.0	2.00	2.76									SHEET FLOW - ROOF OF SAFEWAY STORE
						51.0	1.58	2.67	0.32	3.08	217.00	11.21	5.00	3-INCH PIPE FLOW TO MH-STB1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B3	0.28	1.38	122.0	3.42	10.82									OVERLAND SHEET FLOW - LANDSCAPE AREA
						275.0	1.07	1.14	4.02	14.84	397.00	12.21	14.84	GUTTER FLOW TO INLET B3
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B4	0.95	0.29	37.0	2.50	1.21									SHEET FLOW - ASPHALT ON 29 ROAD
						134.0	1.04	1.12	1.99	3.20	171.00	10.95	5.00	GUTTER FLOW TO INLET B4
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B5	0.28	0.60	14.0	1.00	5.52									OVERLAND SHEET FLOW - LANDSCAPE AREA
						115.0	1.00	1.10	1.74	7.27	129.00	10.72	7.27	GUTTER FLOW TO INLET B5
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B6	0.28	0.88	13.0	1.00	5.32									OVERLAND SHEET FLOW - LANDSCAPE AREA
						334.0	0.83	1.00	5.57	10.89	347.00	11.93	10.89	GUTTER FLOW TO INLET B6
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B7	0.95	0.71	323.0	2.00	3.85									SHEET FLOW - ROOF OF SAFEWAY STORE
						54.0	1.55	7.77	0.12	3.97	377.00	12.09	5.00	15-INCH PIPE FLOW TO MH-STB6
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B8	0.95	0.24	40.0	2.70	1.23									SHEET FLOW - ASPHALT PARKING LOT
						171.0	1.85	1.50	1.90	3.13	211.00	11.17	5.00	GUTTER FLOW TO INLET B7
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---
B9	0.95	1.47	25.0	1.32	1.23									SHEET FLOW - ASPHALT PARKING LOT
						545.0	0.84	1.01	8.99	10.22	570.00	13.17	10.22	GUTTER FLOW TO INLET B8
--	--	--	--	--	--	--	--	--	--	--	--	--	--	---

FORMULAS

$$Ti = \frac{1.8(1.1-C)(L)^{1/2}}{S^{1/3}} \qquad Tt = \frac{(L)}{60\ \text{SEC/MIN.}\ (V\ \text{F.P.S.})}$$

EXHIBIT 25.0

STORM DRAINAGE SYSTEM DESIGN DATA

(2 YEAR STORM EVENT)
HISTORIC CONDITION - CITY OF GRAND JUNCTION, COLORADO

PROJECT: SAFEWAY COTTONWOOD CENTRE
JOB # 95178
LANDesign LTD.

DATE: 17-Apr-96

LOCATION OR NODE	BASINS	LENGTH FEET	INLET TIME min.	FLOW TIME STREET	FLOW TIME PIPE	Tc min.	COEFF. "C"	INTENSITY "I"	AREA "A" AC.	DIRECT RUNOFF C.F.S.	OTHER RUNOFF C.F.S.	SUM RUNOFF C.F.S.	STREET SLOPE %	STREET CAPACITY ALLOWED C.F.S.	PIPE or CHANNEL SLOPE %	PIPE or CHANNEL SIZE IN.	PIPE or CHANNEL CAPACITY ALLOWED C.F.S.	STREET DESIGN F.P.S.	STREET VELOC. F.P.S.	PIPE or CHANNEL DESIGN F.P.S.	PIPE or CHANNEL VELOC. F.P.S.	REMARKS
				STREET	PIPE or CHANNEL																	
1	H1					31.41	0.22	0.84	11.33	2.09		2.09										FLOW TO EXISTING 12-INCH RCP AT HANS DRAIN

STORM DRAINAGE SYSTEM DESIGN DATA

(100 YEAR STORM EVENT)
HISTORIC CONDITION - CITY OF GRAND JUNCTION, COLORADO

PROJECT: SAFEWAY COTTONWOOD CENTRE
JOB # 95178
LANDesign LTD.

DATE: 17-Apr-96

LOCATION OR NODE	BASINS	LENGTH FEET	INLET TIME min.	FLOW TIME STREET	FLOW TIME PIPE	Tc min.	COEFF. "C"	INTENSITY "I"	AREA "A" AC.	DIRECT RUNOFF C.F.S.	OTHER RUNOFF C.F.S.	SUM RUNOFF C.F.S.	STREET SLOPE %	STREET CAPACITY ALLOWED C.F.S.	PIPE or CHANNEL SLOPE %	PIPE or CHANNEL SIZE IN.	PIPE or CHANNEL CAPACITY ALLOWED C.F.S.	STREET DESIGN F.P.S.	STREET VELOC. F.P.S.	PIPE or CHANNEL DESIGN F.P.S.	PIPE or CHANNEL VELOC. F.P.S.	REMARKS
				STREET	PIPE or CHANNEL																	
1	H1					29.92	0.28	2.23	11.33	7.07		7.07										FLOW TO EXISTING 12-INCH RCP AT HANS DRAIN

EXHIBIT 26.0

STORM DRAINAGE SYSTEM DESIGN DATA

(2 YEAR STORM EVENT)
DEVELOPED CONDITION - CITY OF GRAND JUNCTION, COLORADO

DATE:
23-Apr-96

PROJECT: SAFEWAY COTTONWOOD CENTRE
JOB # 95178
LANDesign LTD.

														STREET		PIPE or CHANNEL			STREET		PIPE or CHANNEL		
LOCATION OR NODE	BASINS	LENGTH FEET	INLET TIME min.	FLOW STREET	FLOW PIPE	TIME Tc min.	COEFF. "C"	INTENSITY "I"	AREA "A" AC.	DIRECT RUNOFF C.F.S.	OTHER RUNOFF C.F.S.	SUM RUNOFF C.F.S.	SLOPE %	CAPACITY ALLOWED C.F.S.	SLOPE %	SIZE IN.	CAPACITY ALLOWED C.F.S.	DESIGN F.P.S.	VELOC. F.P.S.	DESIGN F.P.S.	VELOC. F.P.S.	REMARKS
POND	A1-A4						0.87		3.96													FLOW FROM STORM SYSTEM SEWER "A"
	B1-B9						0.85		7.33													FLOW FROM STORM SYSTEM SEWER "B"
						19.47	0.86	1.13	11.29	10.97		10.97										TOTAL ROUTED FLOW TO DETENTION POND

STORM DRAINAGE SYSTEM DESIGN DATA

(100 YEAR STORM EVENT)
DEVELOPED CONDITION - CITY OF GRAND JUNCTION, COLORADO

DATE:
23-Apr-96

PROJECT: SAFEWAY COTTONWOOD CENTRE
JOB # 95178
LANDesign LTD.

														STREET		PIPE or CHANNEL			STREET		PIPE or CHANNEL		
LOCATION OR NODE	BASINS	LENGTH FEET	INLET TIME min.	FLOW STREET	FLOW PIPE	TIME Tc min.	COEFF. "C"	INTENSITY "I"	AREA "A" AC.	DIRECT RUNOFF C.F.S.	OTHER RUNOFF C.F.S.	SUM RUNOFF C.F.S.	SLOPE %	CAPACITY ALLOWED C.F.S.	SLOPE %	SIZE IN.	CAPACITY ALLOWED C.F.S.	DESIGN F.P.S.	VELOC. F.P.S.	DESIGN F.P.S.	VELOC. F.P.S.	REMARKS
POND	A1-A4						0.89		3.96													FLOW FROM STORM SYSTEM SEWER "A"
	B1-B9						0.88		7.33													FLOW FROM STORM SYSTEM SEWER "B"
						18.50	0.88	2.95	11.29	29.31		29.31										TOTAL ROUTED FLOW TO DETENTION POND

EXHIBIT 27.0

Headloss Coefficients for Manholes and Junctions

These are typical headloss coefficients used in the standard method for estimating headloss through manholes and junctions.

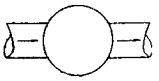
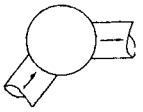
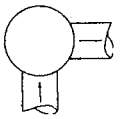
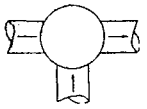
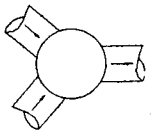
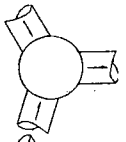
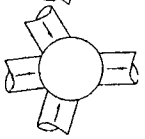
Type of Manhole	Diagram	Headloss Coefficient
Trunkline only with no bend at the junction		0.5
Trunkline only with 45 degree bend at junction		0.6
Trunkline only with 90 degree bend at junction		0.8
Trunkline with one lateral		Small 0.6 Large 0.7
Two roughly equivalent entrance lines with angle of < 90 degrees between lines		0.8
Two roughly equivalent entrance lines with angle of > 90 degrees between lines		0.9
Three or more entrance lines		1.0

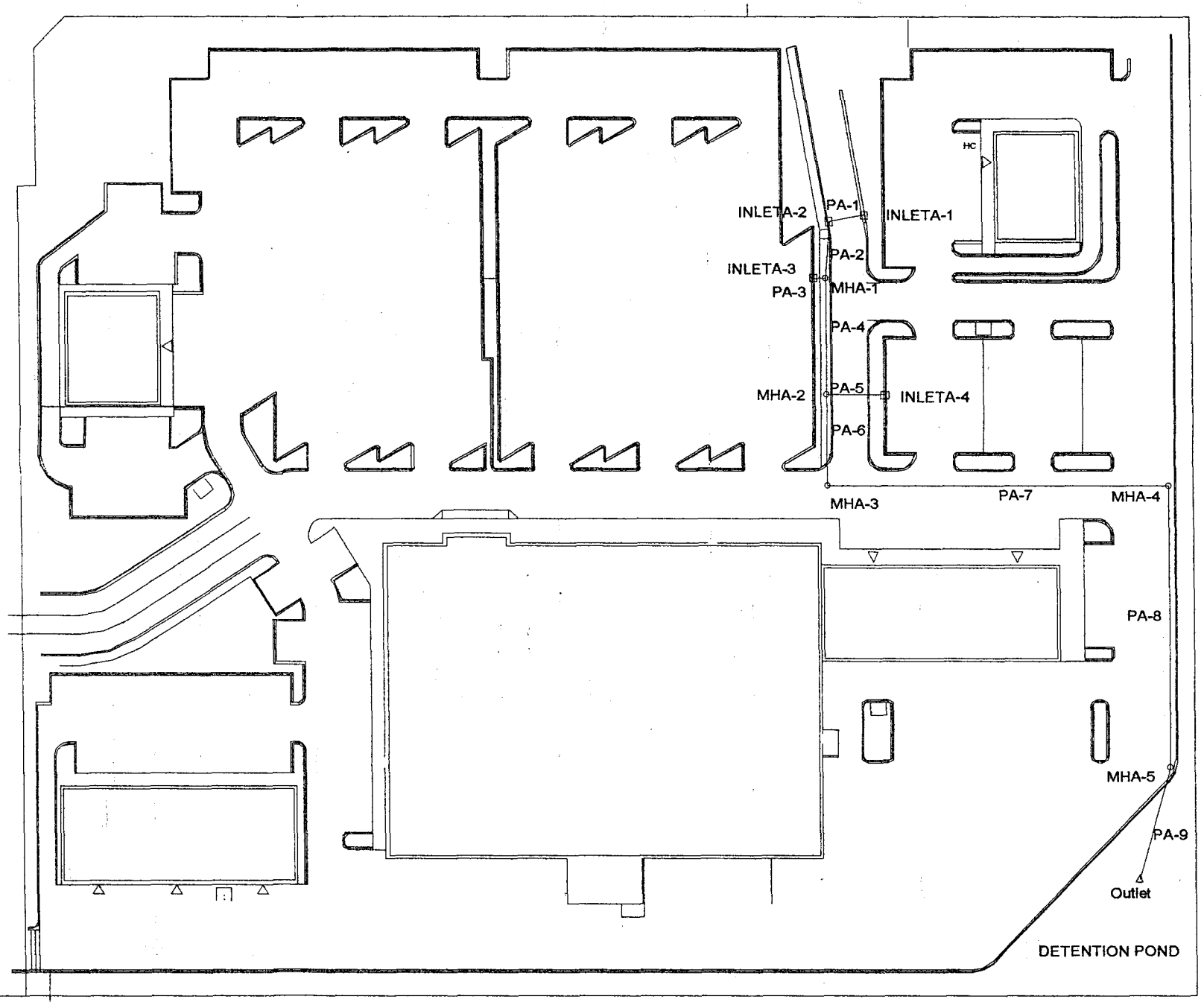
EXHIBIT 28.0

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

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

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

EXHIBIT 29.0



STORM LINE "A"
PLAN VIEW

EXHIBIT 30.0

Project Title: SAFEWAY COTTONWOOD CENTRE
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LANDESIGN
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0

2 YEAR STORM Node Report LINE A

Node	Description	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet TC (min)	Upstream Flow Time (min)	System Flow Time (min)	System Intensity (in/hr)	Total Watershed (CIA) (cfs)	Discharge (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	HGL In (ft)	HGL Out (ft)	Inlet Intensity (in/hr)	Inlet Discharge (cfs)	Sump Elevation (ft)
INLETA-1	FLOW FROM SUB-BASIN A1	0.97	0.78	0.76	0.76	12.99	0.00	12.99	1.36	1.04	1.04	72.68	72.68	71.06	71.00	1.36	1.04	70.51
INLETA-2	FLOW FROM SUB-BASIN A2	1.11	0.93	1.03	1.79	8.86	13.15	13.15	1.35	2.44	2.44	72.68	72.68	70.98	70.83	1.60	1.66	70.19
INLETA-3	FLOW FROM SUB-BASIN A3	1.50	0.86	1.29	1.29	9.88	0.00	9.88	1.53	1.99	1.99	72.68	72.68	71.24	71.11	1.53	1.99	70.51
INLETA-4	FLOW FROM SUB-BASIN A4	0.38	0.93	0.35	0.35	6.40	0.00	6.40	1.79	0.64	0.64	72.96	72.96	71.18	71.12	1.79	0.64	70.79
MHA-1		N/A	N/A	N/A	3.08	N/A	13.34	13.34	1.35	4.18	4.18	73.46	73.46	70.83	70.63	N/A	N/A	69.82
MHA-2		N/A	N/A	N/A	3.43	N/A	13.62	13.62	1.34	4.62	4.62	74.19	74.19	70.21	70.02	N/A	N/A	69.26
MHA-3		N/A	N/A	N/A	3.43	N/A	13.84	13.84	1.33	4.59	4.59	74.36	74.36	69.76	69.53	N/A	N/A	68.78
MHA-4		N/A	N/A	N/A	3.43	N/A	14.83	14.83	1.29	4.45	4.45	73.43	73.43	68.69	68.61	N/A	N/A	67.51
MHA-5		N/A	N/A	N/A	3.43	N/A	16.30	16.30	1.23	4.26	4.26	72.03	72.03	68.58	68.56	N/A	N/A	66.44
Outlet		N/A	N/A	N/A	3.43	N/A	16.74	16.74	1.22	4.21	N/A	68.29	68.29	68.55	68.55	N/A	N/A	65.65

EXHIBIT 31.0

2 YEAR STORM Pipe Report LINE A

Pipe	Upstream Node	Downstream Node	Section Size	Length (ft)	Constructed Slope (ft/ft)	Discharge (cfs)	Roughness	Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Upstream HGL (ft)	Downstream HGL (ft)	Description
PA-1	INLETA-1	INLETA-2	12 inch	24.00	0.005000	1.04	0.013	2.52	70.51	70.39	72.68	72.68	1.17	1.29	71.00	70.98	
PA-2	INLETA-2	MHA-1	18 inch	33.29	0.005107	2.44	0.013	7.51	70.19	70.02	72.68	73.46	0.99	1.94	70.83	70.83	
PA-3	INLETA-3	MHA-1	12 inch	7.21	0.067961	1.99	0.013	9.29	70.51	70.02	72.68	73.46	1.17	2.44	71.11	70.83	
PA-4	MHA-1	MHA-2	18 inch	72.71	0.004951	4.18	0.013	7.39	69.82	69.46	73.46	74.19	2.14	3.23	70.63	70.24	
PA-5	INLETA-4	MHA-2	12 inch	36.79	0.036151	0.64	0.013	6.77	70.79	69.46	72.96	74.19	1.17	3.73	71.12	70.21	
PA-6	MHA-2	MHA-3	24 inch	56.03	0.004997	4.62	0.013	15.99	69.26	68.98	74.19	74.36	2.93	3.38	70.02	69.76	
PA-7	MHA-3	MHA-4	24 inch	214.28	0.004993	4.59	0.013	15.99	68.78	67.71	74.36	73.43	3.58	3.72	69.53	68.69	
PA-8	MHA-4	MHA-5	24 inch	174.26	0.004993	4.45	0.013	15.98	67.51	66.64	73.43	72.03	3.92	3.39	68.61	68.58	
PA-9	MHA-5	Outlet	24 inch	36.37	0.021721	4.26	0.013	33.34	66.44	65.65	72.03	68.29	3.59	0.64	68.56	68.55	

EXHIBIT 32.0

100 YEAR STORM Node Report LINE A

Node	Description	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet TC (min)	Upstream Flow Time (min)	System Flow Time (min)	System Intensity (in/hr)	Total Watershed (CIA) (cfs)	Discharge (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	HGL In (ft)	HGL Out (ft)	Inlet Intensity (in/hr)	Inlet Discharge (cfs)	Sump Elevation (ft)
INLETA-1	FLOW FROM SUB-BASIN A1	0.97	0.80	0.78	0.78	12.48	0.00	12.48	3.49	2.73	2.73	72.68	72.68	73.46	73.46	3.49	2.73	70.51
INLETA-2	FLOW FROM SUB-BASIN A2	1.11	0.95	1.05	1.83	8.69	12.60	12.60	3.47	6.41	6.41	72.68	72.68	73.46	73.46	4.05	4.31	70.19
INLETA-3	FLOW FROM SUB-BASIN A3	1.50	0.89	1.33	1.33	9.42	0.00	9.42	3.91	5.26	5.26	72.68	72.68	73.46	73.46	3.91	5.26	70.51
INLETA-4	FLOW FROM SUB-BASIN A4	0.38	0.95	0.36	0.36	6.16	0.00	6.16	4.61	1.68	1.68	72.96	72.96	73.04	73.04	4.61	1.68	70.79
MHA-1		N/A	N/A	N/A	3.17	N/A	12.75	12.75	3.46	11.03	11.03	73.46	73.46	73.46	73.46	N/A	N/A	69.82
MHA-2		N/A	N/A	N/A	3.53	N/A	12.94	12.94	3.44	12.22	12.22	74.19	74.19	73.04	72.87	N/A	N/A	69.26
MHA-3		N/A	N/A	N/A	3.53	N/A	13.18	13.18	3.41	12.13	12.13	74.36	74.36	72.71	72.53	N/A	N/A	68.78
MHA-4		N/A	N/A	N/A	3.53	N/A	14.11	14.11	3.32	11.80	11.80	73.43	73.43	71.91	71.73	N/A	N/A	67.51
MHA-5		N/A	N/A	N/A	3.53	N/A	14.88	14.88	3.25	11.56	11.56	72.03	72.03	71.26	71.14	N/A	N/A	66.44
Outlet		N/A	N/A	N/A	3.53	N/A	15.05	15.05	3.24	11.50	N/A	68.29	68.29	71.05	71.05	N/A	N/A	65.65

100 YEAR STM. INLET CAPACITY = 13.0 CFS
INLET A-1 THRU INLET A-4 ARE SINGLE COMBINATION.

Project Title: SAFEWAY COTTONWOOD CENTRE
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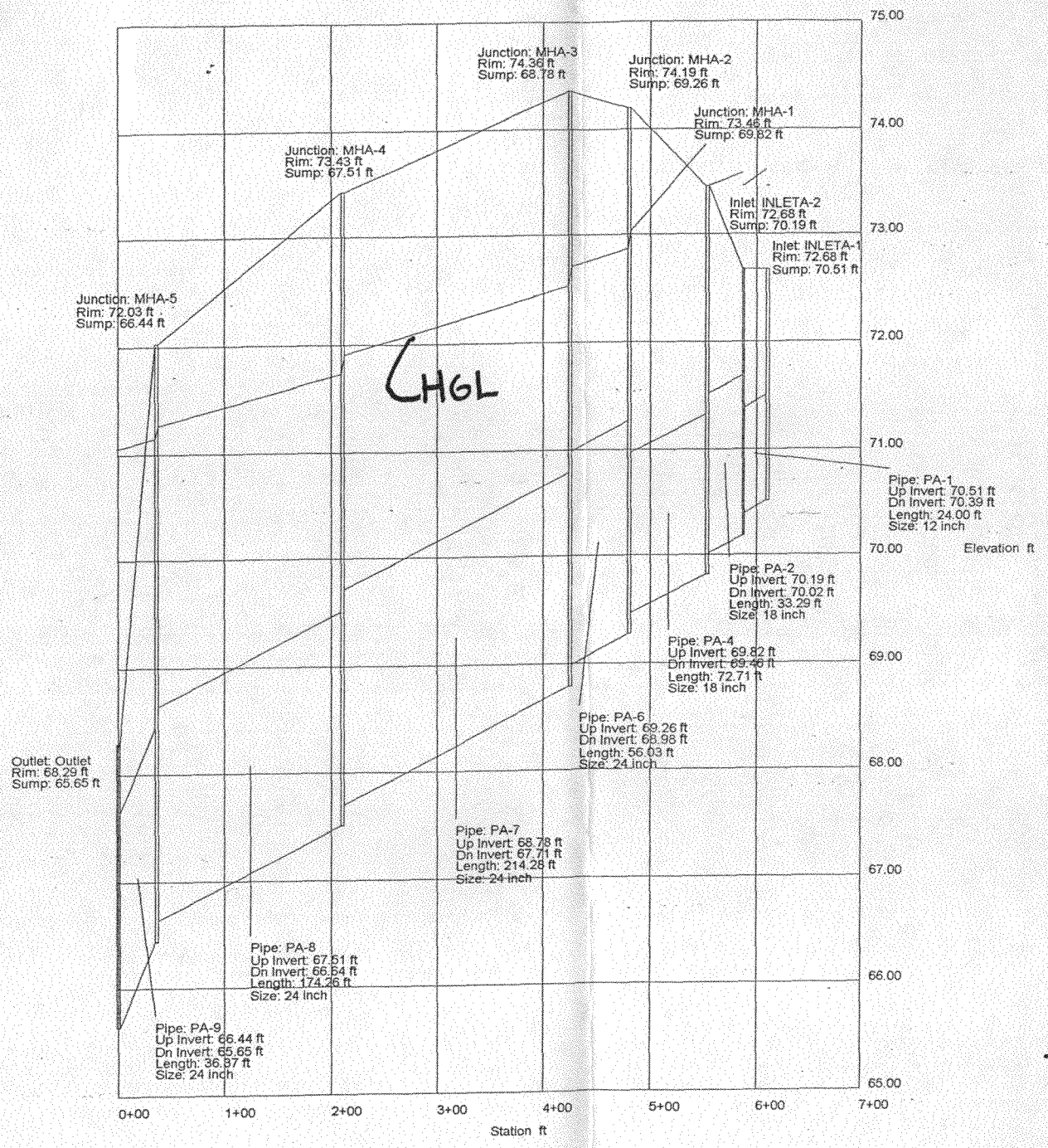
Project Engineer: Monty D. Stroup
StormCAD v1.0

EXHIBIT 33.0

100 YEAR STORM Pipe Report LINE A

Pipe	Upstream Node	Downstream Node	Section Size	Length (ft)	Constructed Slope (ft/ft)	Discharge (cfs)	Roughness	Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Upstream HGL (ft)	Downstream HGL (ft)	Description
PA-1	INLETA-1	INLETA-2	12 inch	24.00	0.005000	2.73	0.013	2.52	70.51	70.39	72.68	72.68	1.17	1.29	73.60	73.46	
PA-2	INLETA-2	MHA-1	18 inch	33.29	0.005107	6.41	0.013	7.51	70.19	70.02	72.68	73.46	0.99	1.94	73.58	73.46	
PA-3	INLETA-3	MHA-1	12 inch	7.21	0.067961	5.26	0.013	9.29	70.51	70.02	72.68	73.46	1.17	2.44	73.62	73.46	
PA-4	MHA-1	MHA-2	18 inch	72.71	0.004951	11.03	0.013	7.39	69.82	69.46	73.46	74.19	2.14	3.23	73.84	73.04	
PA-5	INLETA-4	MHA-2	12 inch	36.79	0.036151	1.68	0.013	6.77	70.79	69.46	72.96	74.19	1.17	3.73	73.12	73.04	
PA-6	MHA-2	MHA-3	24 inch	56.03	0.004997	12.22	0.013	15.99	69.26	68.98	74.19	74.36	2.93	3.38	72.87	72.71	
PA-7	MHA-3	MHA-4	24 inch	214.28	0.004993	12.13	0.013	15.99	68.78	67.71	74.36	73.43	3.58	3.72	72.53	71.91	
PA-8	MHA-4	MHA-5	24 inch	174.26	0.004993	11.80	0.013	15.98	67.51	66.64	73.43	72.03	3.92	3.39	71.73	71.26	
PA-9	MHA-5	Outlet	24 inch	36.37	0.021721	11.56	0.013	33.34	66.44	65.65	72.03	68.29	3.59	0.64	71.14	71.05	

EXHIBIT 34.0



100 YEAR STORM
STORM LINE "A"
FROM INLET A-1

Project Title: SAFEWAY COTTONWOOD CENTRE
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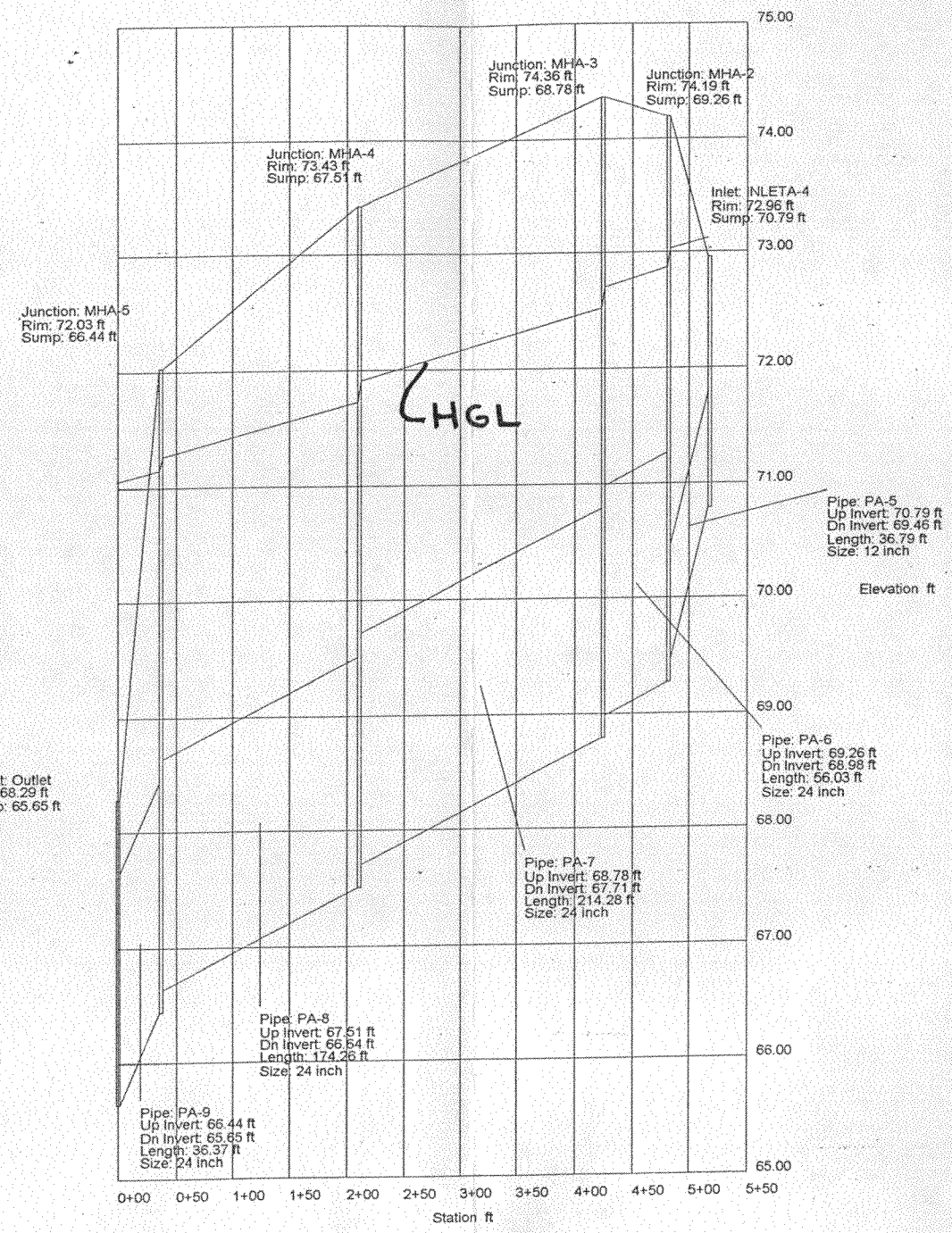
LANDESIGN
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0

EXHIBIT 35.0



100 YEAR STORM
STORM LINE "A"
FROM INLET A-4

Project Title: SAFEWAY COTTONWOOD CENTRE
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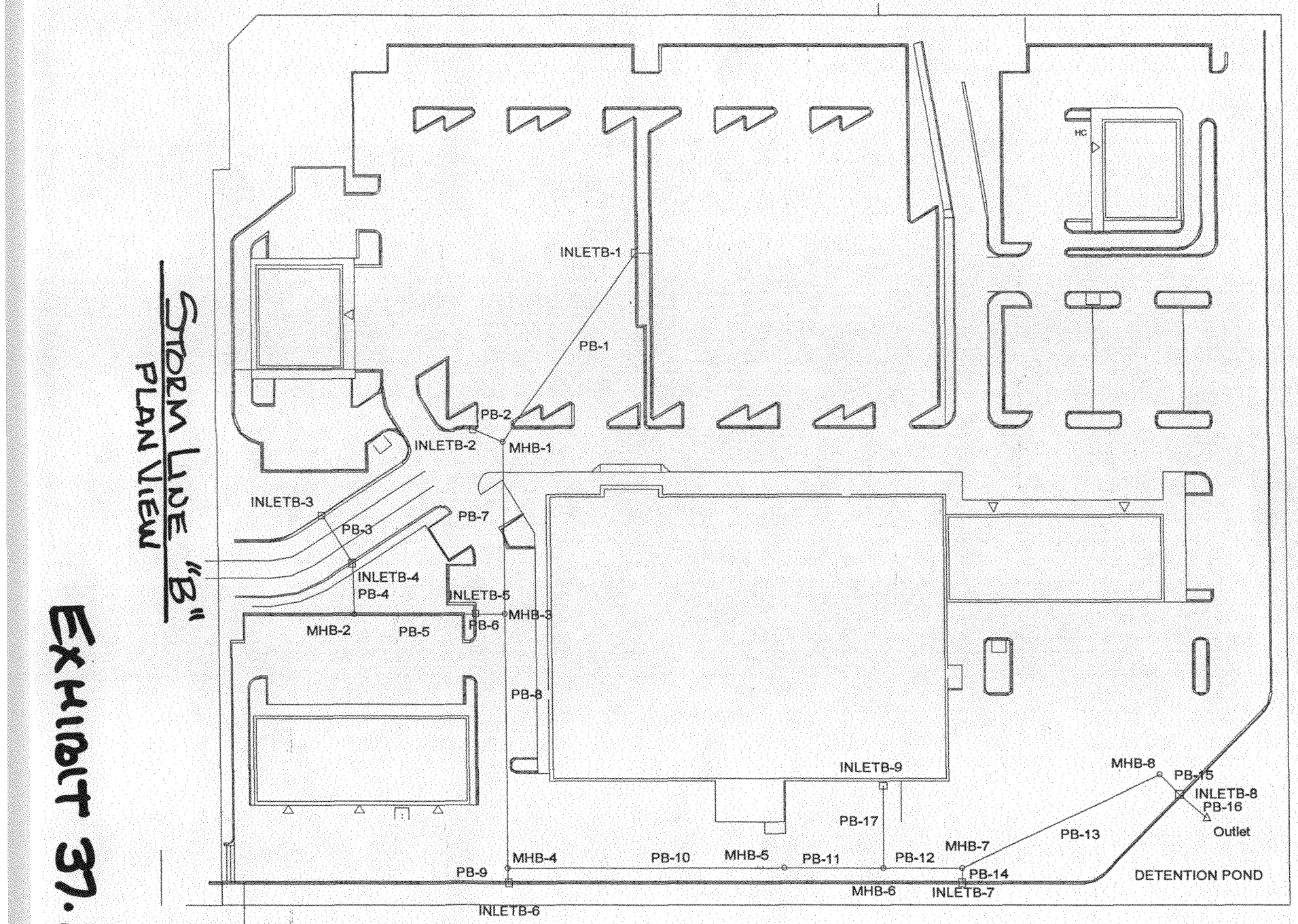
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0
Page 1 of 1

EXHIBIT 36.0

EXHIBIT 37.0

STORM LINE "B"
PLAN VIEW



Project Title: SAFEWAY COTTONWOOD CENTRE
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LANDESIGN

 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0

2 YEAR STORM Node Report LINE B

Node	Description	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet TC (min)	Upstream Flow Time (min)	System Flow Time (min)	System Intensity (in/hr)	Total Watershed (CIA) (cfs)	Discharge (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	HGL In (ft)	HGL Out (ft)	Inlet Intensity (in/hr)	Inlet Discharge (cfs)	Sump Elevation (ft)
INLETB-1	FLOW FROM SUB-BASIN B1	1.47	0.77	1.13	1.13	13.63	0.00	13.63	1.33	1.52	1.52	74.00	74.00	72.20	72.13	1.33	1.52	71.63
INLETB-2	FLOW FROM SUB-BASIN B2	0.29	0.93	0.27	0.27	5.00	0.00	5.00	1.95	0.53	0.53	75.27	75.27	73.47	73.40	1.95	0.53	73.10
INLETB-3	FLOW FROM SUB-BASIN B3	1.38	0.73	1.01	1.01	15.63	0.00	15.63	1.25	1.27	1.27	74.83	74.83	73.26	73.17	1.25	1.27	72.66
INLETB-4	FLOW FROM SUB-BASIN B4	0.29	0.81	0.23	1.24	5.00	15.85	15.85	1.25	1.56	1.56	74.83	74.83	73.05	72.94	1.95	0.46	72.37
INLETB-5	FLOW FROM SUB-BASIN B5	0.60	0.87	0.52	1.76	7.67	16.49	16.49	1.23	2.18	2.18	74.61	74.61	72.24	72.14	1.69	0.89	71.58
INLETB-6	FLOW FROM SUB-BASIN B6	0.88	0.93	0.82	0.82	11.28	0.00	11.28	1.45	1.19	1.19	74.10	74.10	70.30	70.24	1.45	1.19	69.65
INLETB-7	FLOW FROM SUB-BASIN B8	0.24	0.93	0.22	0.22	5.00	0.00	5.00	1.95	0.44	0.44	72.19	72.19	68.79	68.79	1.95	0.44	68.19
INLETB-8	FLOW FROM SUB-BASIN B9	1.47	0.93	1.37	6.25	10.39	20.09	20.09	1.11	6.98	6.98	71.24	71.24	68.61	68.57	1.50	2.06	66.30
INLETB-9	FLOW FROM SUB-BASIN B7	0.71	0.95	0.67	0.67	5.00	0.00	5.00	1.95	1.33	1.33	73.75	73.75	69.31	69.21	1.95	1.33	68.75
MHB-1		N/A	N/A	N/A	1.40	N/A	14.52	14.52	1.30	1.84	1.84	75.90	75.90	71.55	71.46	N/A	N/A	70.95
MHB-2		N/A	N/A	N/A	1.24	N/A	16.01	16.01	1.24	1.55	1.55	75.30	75.30	72.70	72.57	N/A	N/A	72.10
MHB-3		N/A	N/A	N/A	3.17	N/A	16.61	16.61	1.22	3.90	3.90	75.33	75.33	71.14	70.96	N/A	N/A	70.27
MHB-4		N/A	N/A	N/A	3.98	N/A	17.43	17.43	1.19	4.79	4.79	74.50	74.50	70.28	70.08	N/A	N/A	69.31
MHB-5		N/A	N/A	N/A	3.98	N/A	18.19	18.19	1.16	4.68	4.68	75.51	75.51	69.16	69.02	N/A	N/A	68.26
MHB-6		N/A	N/A	N/A	4.66	N/A	18.51	18.51	1.15	5.42	5.42	73.81	73.81	68.93	68.80	N/A	N/A	67.82
MHB-7		N/A	N/A	N/A	4.88	N/A	18.80	18.80	1.15	5.64	5.64	72.50	72.50	68.79	68.69	N/A	N/A	67.45
MHB-8		N/A	N/A	N/A	4.88	N/A	19.89	19.89	1.11	5.48	5.48	71.65	71.65	68.65	68.62	N/A	N/A	66.50
Outlet		N/A	N/A	N/A	6.25	N/A	20.22	20.22	1.10	6.95	N/A	68.28	68.28	68.55	68.55	N/A	N/A	65.39

EXHIBIT 38.0

2 YEAR STORM Pipe Report LINE B

Pipe	Upstream Node	Downstream Node	Section Size	Length (ft)	Constructed Slope (ft/ft)	Discharge (cfs)	Roughness	Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Upstream HGL (ft)	Downstream HGL (ft)	Description
PB-1	INLETB-1	MHB-1	18 inch	156.69	0.003702	1.52	0.013	6.39	71.63	71.05	74.00	75.90	0.87	3.35	72.13	71.55	
PB-2	INLETB-2	MHB-1	12 inch	23.38	0.087682	0.53	0.013	10.55	73.10	71.05	75.27	75.90	1.17	3.85	73.40	71.55	
PB-3	INLETB-3	INLETB-4	12 inch	38.84	0.004892	1.27	0.013	2.49	72.66	72.47	74.83	74.83	1.17	1.36	73.17	73.05	
PB-4	INLETB-4	MHB-2	12 inch	34.30	0.004956	1.56	0.013	2.51	72.37	72.20	74.83	75.30	1.46	2.10	72.94	72.73	
PB-5	MHB-2	INLETB-5	18 inch	84.04	0.004998	1.55	0.013	7.43	72.10	71.68	75.30	74.61	1.70	1.43	72.57	72.24	
PB-6	INLETB-5	MHB-3	18 inch	22.00	0.055000	2.18	0.013	24.63	71.58	70.37	74.61	75.33	1.53	3.46	72.14	71.14	
PB-7	MHB-1	MHB-3	18 inch	116.00	0.005000	1.84	0.013	7.43	70.95	70.37	75.90	75.33	3.45	3.46	71.46	71.14	
PB-8	MHB-3	MHB-4	24 inch	173.07	0.004969	3.90	0.013	15.95	70.27	69.41	75.33	74.50	3.06	3.09	70.96	70.28	
PB-9	INLETB-6	MHB-4	12 inch	8.00	0.030000	1.19	0.013	6.17	69.65	69.41	74.10	74.50	3.45	4.09	70.24	70.28	
PB-10	MHB-4	MHB-5	24 inch	190.52	0.004986	4.79	0.013	15.97	69.31	68.36	74.50	75.51	3.19	5.15	70.08	69.16	
PB-11	MHB-5	MHB-6	24 inch	68.68	0.004950	4.68	0.013	15.92	68.26	67.92	75.51	73.81	5.25	3.89	69.02	68.93	
PB-12	MHB-6	MHB-7	24 inch	54.26	0.004976	5.42	0.013	15.96	67.82	67.55	73.81	72.50	3.99	2.95	68.80	68.79	
PB-13	MHB-7	MHB-8	24 inch	149.81	0.005006	5.64	0.013	16.01	67.45	66.70	72.50	71.65	3.05	2.95	68.69	68.65	
PB-14	INLETB-7	MHB-7	12 inch	8.00	0.080000	0.44	0.013	10.08	68.19	67.55	72.19	72.50	3.00	3.95	68.79	68.79	
PB-15	MHB-8	INLETB-8	24 inch	20.00	0.005000	5.48	0.013	16.00	66.50	66.40	71.65	71.24	3.15	2.84	68.62	68.60	
PB-16	INLETB-8	Outlet	24 inch	17.58	0.051763	6.98	0.013	51.47	66.30	65.39	71.24	68.28	2.94	0.89	68.57	68.55	
PB-17	INLETB-9	MHB-6	15 inch	53.64	0.015474	1.33	0.010	10.45	68.75	67.92	73.75	73.81	3.75	4.64	69.21	68.93	

Project Title: SAFEWAY COTTONWOOD CENTRE
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 LANDESIGN 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0

EXHIBIT 39.0

100 YEAR STORM Node Report LINE B

Node	Description	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet TC (min)	Upstream Flow Time (min)	System Flow Time (min)	System Intensity (in/hr)	Total Watershed (CIA) (cfs)	Discharge (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	HGL In (ft)	HGL Out (ft)	Inlet Intensity (in/hr)	Inlet Discharge (cfs)	Sump Elevation (ft)
INLETB-1	FLOW FROM SUB-BASIN B1	1.47	0.80	1.18	1.18	12.85	0.00	12.85	3.45	4.09	4.09	74.00	74.00	74.95	74.95	3.45	4.09	71.63
INLETB-2	FLOW FROM SUB-BASIN B2	0.29	0.95	0.28	0.28	5.00	0.00	5.00	4.95	1.37	1.37	75.27	75.27	75.02	74.99	4.95	1.37	73.10
INLETB-3	FLOW FROM SUB-BASIN B3	1.38	0.79	1.09	1.09	14.84	0.00	14.84	3.25	3.58	3.58	74.83	74.83	74.86	74.86	3.25	3.58	72.66
INLETB-4	FLOW FROM SUB-BASIN B4	0.29	0.86	0.25	1.34	5.00	14.98	14.98	3.24	4.38	4.38	74.83	74.83	74.86	74.86	4.95	1.24	72.37
INLETB-5	FLOW FROM SUB-BASIN B5	0.60	0.90	0.54	1.88	7.27	15.65	15.65	3.18	6.03	6.03	74.61	74.61	74.64	74.64	4.34	2.36	71.58
INLETB-6	FLOW FROM SUB-BASIN B6	0.88	0.95	0.84	0.84	10.89	0.00	10.89	3.68	3.10	3.10	74.10	74.10	74.13	74.13	3.68	3.10	69.65
INLETB-7	FLOW FROM SUB-BASIN B8	0.24	0.95	0.23	0.23	5.00	0.00	5.00	4.95	1.14	1.14	72.19	72.19	72.50	72.50	4.95	1.14	68.19
INLETB-8	FLOW FROM SUB-BASIN B9	1.47	0.95	1.40	6.47	10.22	18.43	18.43	2.96	19.26	19.26	71.24	71.24	71.24	71.18	3.77	5.31	66.30
INLETB-9	FLOW FROM SUB-BASIN B7	0.71	0.95	0.67	0.67	5.00	0.00	5.00	4.95	3.37	3.37	73.75	73.75	73.13	73.06	4.95	3.37	68.75
MHB-1		N/A	N/A	N/A	1.45	N/A	13.98	13.98	3.33	4.88	4.88	75.90	75.90	74.95	74.89	N/A	N/A	70.95
MHB-2		N/A	N/A	N/A	1.34	N/A	15.08	15.08	3.23	4.36	4.36	75.30	75.30	74.86	74.79	N/A	N/A	72.10
MHB-3		N/A	N/A	N/A	3.33	N/A	15.76	15.76	3.17	10.65	10.65	75.33	75.33	74.64	74.52	N/A	N/A	70.27
MHB-4		N/A	N/A	N/A	4.17	N/A	16.61	16.61	3.10	13.03	13.03	74.50	74.50	74.13	73.95	N/A	N/A	69.31
MHB-5		N/A	N/A	N/A	4.17	N/A	17.38	17.38	3.04	12.77	12.77	75.51	75.51	73.32	73.19	N/A	N/A	68.26
MHB-6		N/A	N/A	N/A	4.84	N/A	17.66	17.66	3.02	14.73	14.73	73.81	73.81	72.97	72.73	N/A	N/A	67.82
MHB-7		N/A	N/A	N/A	5.07	N/A	17.85	17.85	3.00	15.34	15.34	72.50	72.50	72.50	72.23	N/A	N/A	67.45
MHB-8		N/A	N/A	N/A	5.07	N/A	18.36	18.36	2.96	15.13	15.13	71.65	71.65	71.55	71.33	N/A	N/A	66.50
Outlet		N/A	N/A	N/A	6.47	N/A	18.48	18.48	2.95	19.24	N/A	68.28	68.28	71.05	71.05	N/A	N/A	65.39

100 YEAR STM. INLET CAPACITY = 13.0 CFS
INLETS B-1 THRU B-7 ARE SINGLE COMBINATION
INLET B-8 IS A DOUBLE COMBINATION

EXHIBIT 40.0

100 YEAR STORM Pipe Report LINE B

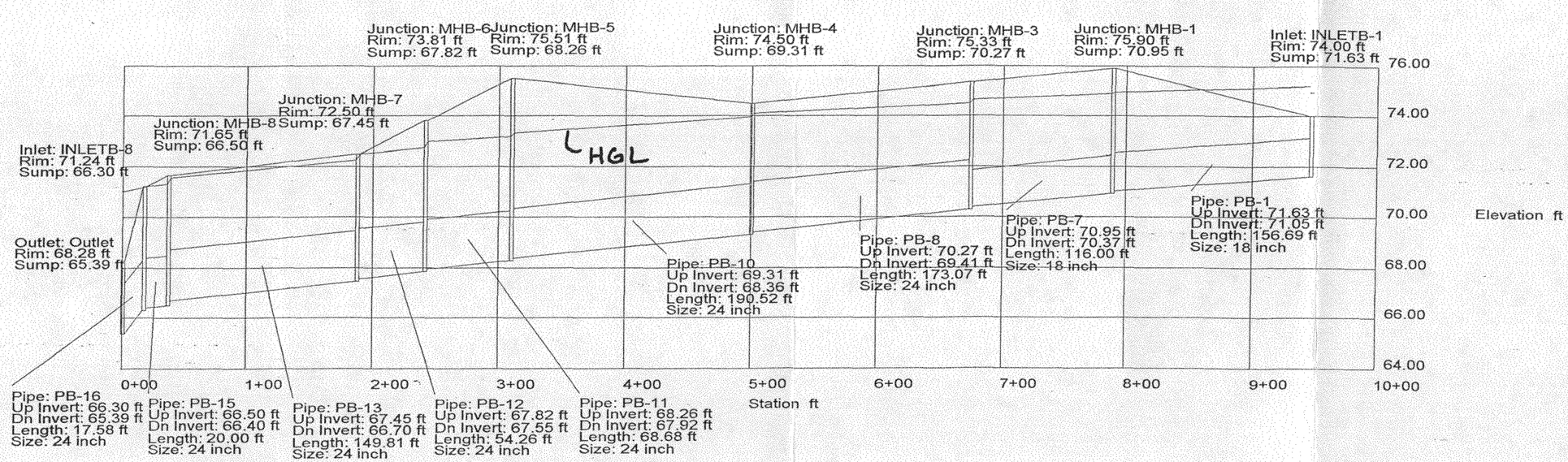
Pipe	Upstream Node	Downstream Node	Section Size	Length (ft)	Constructed Slope (ft/ft)	Discharge (cfs)	Roughness	Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Upstream HGL (ft)	Downstream HGL (ft)	Description
PB-1	INLETB-1	MHB-1	18 inch	156.69	0.003702	4.09	0.013	6.39	71.63	71.05	74.00	75.90	0.87	3.35	75.19	74.95	
PB-2	INLETB-2	MHB-1	12 inch	23.38	0.087682	1.37	0.013	10.55	73.10	71.05	75.27	75.90	1.17	3.85	74.99	74.95	
PB-3	INLETB-3	INLETB-4	12 inch	38.84	0.004892	3.58	0.013	2.49	72.66	72.47	74.83	74.83	1.17	1.36	75.26	74.86	
PB-4	INLETB-4	MHB-2	12 inch	34.30	0.004956	4.38	0.013	2.51	72.37	72.20	74.83	75.30	1.46	2.10	75.38	74.86	
PB-5	MHB-2	INLETB-5	18 inch	84.04	0.004998	4.36	0.013	7.43	72.10	71.68	75.30	74.61	1.70	1.43	74.79	74.64	
PB-6	INLETB-5	MHB-3	18 inch	22.00	0.055000	6.03	0.013	24.63	71.58	70.37	74.61	75.33	1.53	3.46	74.72	74.64	
PB-7	MHB-1	MHB-3	18 inch	116.00	0.005000	4.88	0.013	7.43	70.95	70.37	75.90	75.33	3.45	3.46	74.89	74.64	
PB-8	MHB-3	MHB-4	24 inch	173.07	0.004969	10.65	0.013	15.95	70.27	69.41	75.33	74.50	3.06	3.09	74.52	74.13	
PB-9	INLETB-6	MHB-4	12 inch	8.00	0.030000	3.10	0.013	6.17	69.65	69.41	74.10	74.50	3.45	4.09	74.20	74.13	
PB-10	MHB-4	MHB-5	24 inch	190.52	0.004986	13.03	0.013	15.97	69.31	68.36	74.50	75.51	3.19	5.15	73.95	73.32	
PB-11	MHB-5	MHB-6	24 inch	68.68	0.004950	12.77	0.013	15.92	68.26	67.92	75.51	73.81	5.25	3.89	73.19	72.97	
PB-12	MHB-6	MHB-7	24 inch	54.26	0.004976	14.73	0.013	15.96	67.82	67.55	73.81	72.50	3.99	2.95	72.73	72.50	
PB-13	MHB-7	MHB-8	24 inch	149.81	0.005006	15.34	0.013	16.01	67.45	66.70	72.50	71.65	3.05	2.95	72.23	71.55	
PB-14	INLETB-7	MHB-7	12 inch	8.00	0.080000	1.14	0.013	10.08	68.19	67.55	72.19	72.50	3.00	3.95	72.51	72.50	
PB-15	MHB-8	INLETB-8	24 inch	20.00	0.005000	15.13	0.013	16.00	66.50	66.40	71.65	71.24	3.15	2.84	71.33	71.24	
PB-16	INLETB-8	Outlet	24 inch	17.58	0.051763	19.26	0.013	51.47	66.30	65.39	71.24	68.28	2.94	0.89	71.18	71.05	
PB-17	INLETB-9	MHB-6	15 inch	53.64	0.015474	3.37	0.010	10.45	68.75	67.92	73.75	73.81	3.75	4.64	73.06	72.97	

Project Title: SAFEWAY COTTONWOOD CENTRE
c:\haestad\stmc\safeway2.stm
04/24/96 02:02:38 PM

LANDESIGN
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Mohty D. Stroup
StormCAD v1.0

EXHIBIT 41.0

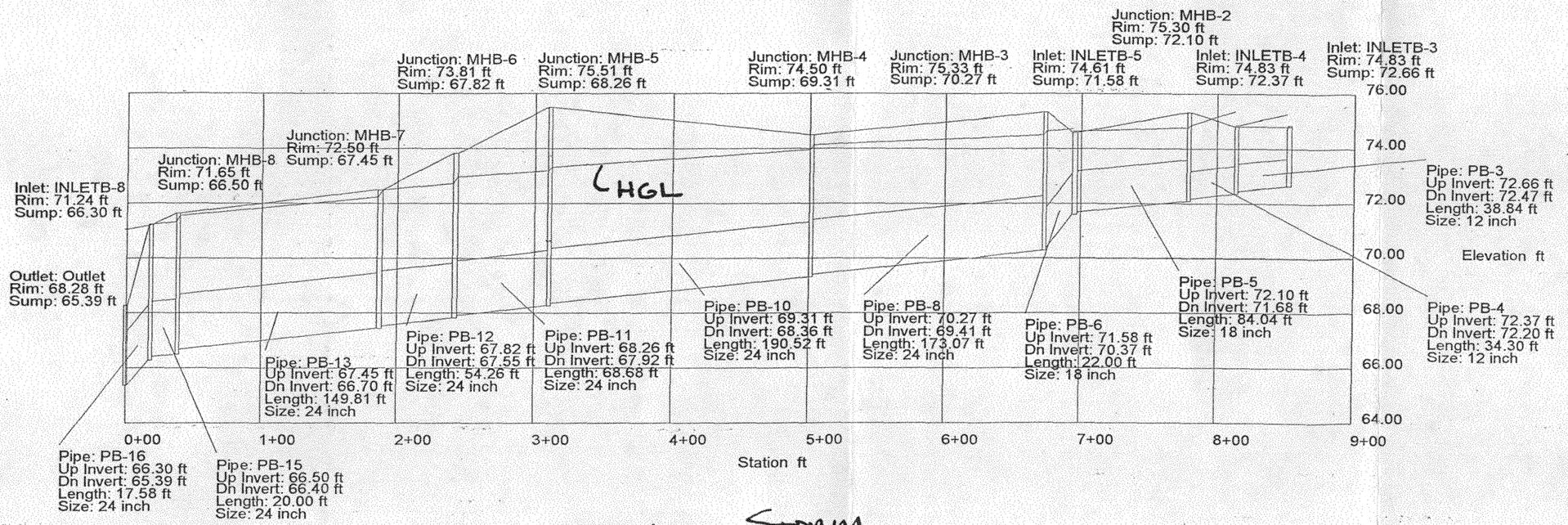


100 YEAR STORM

STORM LINE "B"

FROM INLET B-1

EXHIBIT 42.0



100 YEAR STORM
STORM LINE "B"
FROM INLET B-3

Project Title: SAFEWAY COTTONWOOD CENTRE
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04/24/96 02:24:42 PM

LANDESIGN
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Monty D. Stroup
StormCAD v1.0

EXHIBIT 43.0

PROJECT: **SAFEWAY COTTONWOOD CENTRE**

LOCATION: **CITY OF GRAND JUNCTION, COLORADO**

SUBJECT: **REQUIRED DETENTION POND VOLUME** BASINS: "A" & "B"

DATE: 23-Apr-96

CALC. BY: STROUP

FORMULAS PER CITY OF GRAND JUNCTION

Davg. = 0.67Dmax

2 YEAR RELEASE (ORIFICE & WEIR COMBINATION)

Qr = 0.70 Qmax.
Qmax. = 2.09 CFS
Qr = **1.46** CFS

100 YEAR RELEASE (ORIFICE & WEIR COMBINATION)

Qr = 0.70 Qmax.
Qmax. = 7.07 CFS
Qr = **4.95** CFS

WHERE:

Td = Time of Critical Storm Duration, I
C = Weir Coefficient; OR
C = Runoff Coefficient;
A = Area in Acres;
Qr = Detention Pond Average Releas
Tc = Time of Concentration, Minutes;
Id = Intensity at Td, Inches Per Hour;
Qd = Runoff Rate at Td, CFS;
K = Ratio of Pre and Post- Developme
V = Storage Volume in CF;

SUBSCRIPTS:

2 = 2 - Year Storm
100 = 100 - Year Storm
h = Historic Condition
d = Developed Condition

DETENTION FORMULAS

$$Td_2 = (633.4\ Cd\ A / (Qr - (Qr\ Tcd / (81.2Cd\ A))))^{0.5} - 15.6$$

$$Td_{100} = (1832\ Cd\ A / (Qr - (Qr\ Tcd / (213Cd\ A))))^{0.5} - 17.2$$

Id_2 = Intensity at $Td_2 = 40.6 / (Td_2 + 15.6)$

Id_{100} = Intensity at $Td_{100} = 106.5 / (Td_{100} + 17.2)$

Qd = Cd AId

K = Tch /Tcd

$$V = 60(QdTd - QrTd - QrTcd + KQrTcd/2 + Qr^2\ Tcd/(2Qd))$$

REQUIRED 2 YEAR STORAGE VOLUME

Td_2	Cd	A	Qr	Tc h	Tc d	Id_2	Qd_2	K	V_2
50.50	0.86	11.29	1.4600	31.41	19.47	0.61	5.96	1.6133	**13,525**

REQUIRED 100 YEAR STORAGE VOLUME

Td_{100}	Cd	A	Qr	Tc h	Tc d	Id_{100}	Qd_{100}	K	V_{100}
44.79	0.88	11.29	4.9500	29.92	18.50	1.72	17.07	1.6173	**35,545**

EXHIBIT 44.0

PROJECT: **SAFEWAY COTTONWOOD CENTRE**

LOCATION: **CITY OF GRAND JUNCTION, COLORADO**

SUBJECT: **PIPE STORAGE CALCULATION**

DATE: 29-Apr-96

The following is a calculation of the volume of runoff stored in Storm Sewer Lines "A" and B' The result is subtracted from the required detention pond volume on Exhibit 44.0.

Pipe Size In.	Length Ft.	Storage Vol. Cf. / Lf.	Total Cf.
12	180.52	0.7854	141.78
15	53.64	0.98175	52.661
18	484.73	1.1781	571.06
24	1154.86	1.5708	1814.1
	1873.8		**2579.6**

VOL_{100} REQUIRED = 35,545 C.F.

(-) 2,579.6 IN PIPE

32,965.40 CF

(-) 29,954.00CF POND VOL.

3,011.40 CF PARKING LOT "A"

EXHIBIT 44.1

SAFEWAY

Reservoir No. 4 STAGE / STORAGE / DISCHARGE P. LOT A....

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
0.32	73.00	21	210	0.00
0.42	73.10	1078	1288	0.00
0.52	73.20	1078	2367	0.00
0.62	73.30	1078	3445	0.00
0.72	73.40	1078	4524	0.00
0.82	73.50	1078	5602	0.00
0.92	73.60	1078	6680	0.00
1.02	73.70	1078	7759	0.00
1.12	73.80	1078	8837	0.00
1.22	73.90	1078	9916	0.00
1.32	74.00	1078	10994	0.00

0.58 73.26 3,011.4 100 YEAR

[↵] to cont [PgUp] ↑ [PgDn] ↓ [Esc] to exit

STORAGE IN PARKING LOT "A", ABOVE INLETS A1, A2 AND A3.

EXHIBIT 44.2

DETENTION POND

STAGE / STORAGE TABLE

1. RESERVOIR No = 3. 2. RESERVOIR NAME = SAFEWAY 1533
3. S = Ks * Z^b
Ks = 0..... b = 0.....
START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	65.00.	0.....	0	0
5	0.50	65.50.	471.....	117	117
6	1.00	66.00.	3962....	1108	1225
7	2.00	67.00.	4593....	4277	5502
8	3.00	68.00.	5270....	4931	10433
9	4.00	69.00.	5985....	5627	16060
10	5.00	70.00.	6726....	6355	22415
11	6.00	71.00.	7494....	7110	29525
12	7.00	72.00.	8289....	7891	37416
13	0.00	0.00.	0.....	0	0
14	0.00	0.00.	0.....	0	0

R to reset

Change item number: 0 ↵ to cont

CONTOUR AREAS

EXHIBIT 45.0

MODIFIED TYPE 'C'

OUTLET STRUCTURES

Reservoir: 3

CULVERT STRUC A. Q=CoA[2gh/k]^.5
OUTFLOW PIPE TO HANS DRAIN

1. WIDTH (in) = 12.
2. HEIGHT (in) = 12.
3. No. BARRELS = 1..
4. INVERT ELEV. = 65.....
5. Co = 0.60
6. CULVERT LENGTH (ft) = 38.3
7. CULVERT SLOPE (%) = 1.9.
8. MANNING'S N-VALUE = .013

CULVERT STRUC B. Q=CoA[2gh/k]^.5
LOW FLOW OUTLET

9. WIDTH (in) = 6..
10. HEIGHT (in) = 6..
11. No. BARRELS = 1..
12. INVERT ELEV. = 65.....
13. Co = 0.60
14. CULVERT LENGTH (ft) = .5..
15. CULVERT SLOPE (%) = 0...
16. MANNING'S N-VALUE = .013
17. MULTI-STAGE OPTION ? (Y/N) Y

6" Ø

WEIR STRUCTURE A. Q=CwLH^EXP
100 YEAR RELEASE

18. CREST LENGTH (ft) = 6.5....
19. CREST ELEVATION = 70.62..
20. Cw = 2.58
21. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) N

WEIR STRUCTURE B. Q=CwLH^EXP

23. CREST LENGTH (ft) = 0.....
24. CREST ELEVATION = 0.....
25. Cw = 3.00
26. EXP = 1.50
27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0 ↵ to cont

RESTRICTOR PLATE

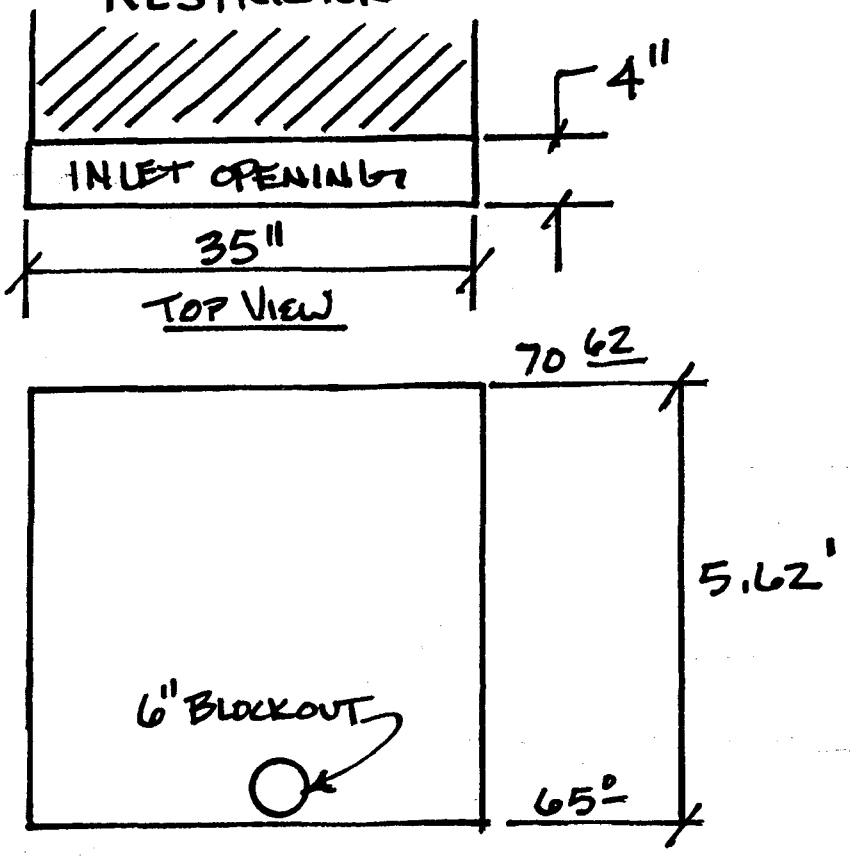

EXHIBIT 46.0

Reservoir No. 3 STAGE / STORAGE / DISCHARGE SAFEWAY 1533

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 1
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 1
Weir struct A. Q = 2.58 * 6.5 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

12" RCP
6" Ø BLOCKOUT

ELEVATION	DISCHARGE (cfs) CULVERT A		CULVERT B		WEIR A	WEIR B	TOTAL
68.00	5.98	IC	1.46	IC	0.00	0.00	1.46
68.10	6.10	IC	1.49	IC	0.00	0.00	1.49
68.20	6.21	IC	1.51	IC	0.00	0.00	1.51
68.30	6.33	IC	1.54	IC	0.00	0.00	1.54
68.40	6.44	IC	1.57	IC	0.00	0.00	1.57
68.50 6855	6.55	IC	1.59	IC	0.00	0.00 1.61	1.59
68.60	6.66	IC	1.62	IC	0.00	0.00 CFS	1.62
68.70	6.76	IC	1.64	IC	0.00	0.00	1.64
68.80	6.87	IC	1.67	IC	0.00	0.00 2YEAR	1.67
68.90	6.97	IC	1.69	IC	0.00	0.00	1.69
69.00	7.07	IC	1.72	IC	0.00	0.00	1.72

[↵] to cont [PgUp] ↑ [PgDn] ↓ [Esc] to exit

Reservoir No. 3 STAGE / STORAGE / DISCHARGE SAFEWAY 1533

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 1
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 1
Weir struct A. Q = 2.58 * 6.5 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

TOP OF BOX

ELEVATION	DISCHARGE (cfs) CULVERT A		CULVERT B		WEIR A	WEIR B	TOTAL
71.00 7105	8.87	IC	2.16	IC	3.93	0.00 6.92	6.09
71.10	8.95	IC	2.18	IC	5.58	0.00 CFS	7.75
71.20	9.03	IC	2.20	IC	7.41	0.00	9.60
71.30	9.11	IC	2.21	IC	9.40	0.00 100	11.62
71.40	9.18	IC	2.23	IC	11.55	0.00 YEAR	13.78
71.50	9.26	IC	2.25	IC	13.84	0.00	16.09
71.60	9.34	IC	2.27	IC	16.27	0.00	18.54
71.70	9.42	IC	2.28	IC	18.82	0.00	21.11
71.80	9.49	IC	2.30	IC	21.50	0.00	23.80
71.90	9.57	IC	2.32	IC	24.29	0.00	26.61
72.00	9.64	IC	2.34	IC	27.19	0.00	29.53

[↵] to cont [PgUp] ↑ [PgDn] ↓ [Esc] to exit

EXHIBIT 47.0

Reservoir No. 3 STAGE / STORAGE / DISCHARGE SAFEWAY 1533

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 1
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 1
Weir struct A. Q = 2.58 * 6.5 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs	
3.00	68.00	493	10433	1.46	
3.10	68.10	563	10996	1.49	
3.20	68.20	563	11558	1.51	
3.30	68.30	563	12121	1.54	
3.40	68.40	563	12684	1.57	
3.50	68.50	563	13247	1.59	2 YEAR
3.60	68.60	563	13809	1.62	
3.70	68.70	563	14372	1.64	
3.80	68.80	563	14935	1.67	
3.90	68.90	563	15497	1.69	
4.00	69.00	563	16060	1.72	

6855 13,525

[↵] to cont [PgUp] ↑ [PgDn] ↓ [Esc] to exit

Reservoir No. 3 STAGE / STORAGE / DISCHARGE SAFEWAY 1533

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 1
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 1
Weir struct A. Q = 2.58 * 6.5 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs	
6.00	71.00	711	29525	6.09	100 YEAR
6.10	71.10	789	30314	7.75	
6.20	71.20	789	31103	9.60	
6.30	71.30	789	31892	11.62	
6.40	71.40	789	32681	13.78	
6.50	71.50	789	33471	16.09	
6.60	71.60	789	34260	18.54	
6.70	71.70	789	35049	21.11	
6.80	71.80	789	35838	23.80	
6.90	71.90	789	36627	26.61	
7.00	72.00	789	37416	29.53	

7105 29,954

[↵] to cont [PgUp] ↑ [PgDn] ↓ [Esc] to exit

TOTAL STORAGE = 29,954 + 2,579.6 + 3,011.4 = 35,545 CF.
POND PIPE LOT A
100 YEAR

EXHIBIT 48.0

LANDesign
ENGINEERING • SURVEYING • PLANNING

June 6, 1996

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

Attn.: Mr. Michael Drollinger.

Re: **Safeway Cottonwood Centre, TCP Credit Request, File #SPR- 96-107.**

Dear Mr. Drollinger;

For and on behalf of Safeway Inc. we are requesting that credit be given towards the (TCP) Traffic Capacity Payment in the amount of $38,654.00 for the Safeway development as a result of proposed public improvements to 29 Road and F Road. The estimated cost of the public improvements is $138,353.45 and shall be completed by Safeway with the development of this project. Further we are requesting that the residual amount, after the credit, of $99,699.45 be applied towards the (TCPs) for the future development of Lots 2, 3, 4 and 5 of the Safeway Cottonwood Centre Subdivision.

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

Sincerely

Monty D. Stroup
Project Manager

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

June 6, 1996

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

Attn.: Mr. Michael Drollinger.

Re: **Safeway Cottonwood Centre, Site Plan Review, Response To Review Comments, File #SPR-96-107.**

Dear Mr. Drollinger;

In response to the review your offices letter, dated May 16, 1996, to Safeway, Inc.; concerning review agency comments for this project and related site plan we present the following:

A. Cover Letter

1. A preconstruction conference will be scheduled prior to the commencement of construction of the public improvements.

2. The status of the Final Plat and associated documentation is as follows;

- The Final Plat has been revised (see response to comments Item O.). The mylar has been signed by the owner and is herein resubmitted for review.

- The Development Improvements Agreement, Exhibit B, has been modified to reflect design revisions as result of review comments.

3. Public Improvements will be guaranteed by a letter of credit. Safeway Inc. is working directly with the planning staff to address any concerns or comments.

B. Mesa County Building Department

The comment indicating approval is acknowledged.

C. Grand Junction Drainage District

1. The City of Grand Junction has recommended dedication language which dedicates the Hans Drain Easement directly to the City of Grand Junction for the benefit and use of the Grand Junction Drainage District. A copy of the dedication language has been forwarded to the Drainage District for review.

2. Safeway will install a gate in the south boundary of the project as requested by the District. The proposed gate is shown on the construction plans.

. The HANS Drain Profile sheet has been revised to show the incoming pipe from the detention pond.

4. The Palisade Irrigation Company has removed the irrigation spill into the HANS Drain. The Drain will then serve only to convey ground water, therefore the District has approved a reduction in pipe size from 12-inch RCP to 8-inch NRCP. The plans have been revised to show these changes.

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D. City Police Department

1. The Lighting Plan is presented as sheet 10 of 35. As noted in the response to comments Item N. the lighting levels have been identified.

2. Safeway Inc. or their Property manager shall have an on going maintenance program which will provide for removal of graffiti from both sides of the perimeter fence as needed.

E. UTE Water

1. Safeway Inc. is agreeable to the conditions of maintenance, design and inspection of the water mains within the development. Ute water has been provided a copy of the Safeway store building plans which show Check Valves for interior fire protection.

2. A note has been added to the Utility Composite indicating that all construction shall conform to Ute Water Specifications.

3. Ute Water will be provided a full set of the construction plans prior to construction.

4. Safeway acknowledges policies and fees at the time of application.

F. State Environmental Health

The comment indicating approval is acknowledged.

G. City Fire Department

1. One additional fire hydrant has been added to the service entrance southwest of the Safeway building as requested.

2. Two fire hydrants have been relocated as requested.

H. Public Service Company

The comment indicating approval is acknowledged.

I. City Property Agent

1. The drainage easement agreement is a Standard Grand Junction Drainage document used in the acquisition of easements. This agreement has not been recorded.

2. The dedication language on the Final Plat has been revised and dedicates the Hans Drain Easement directly to the City of Grand Junction for the benefit and use of the Grand Junction Drainage District.

3. Safeway Inc. Has been in direct contact with members of the planning staff to answer questions and resolve outstanding concerns.

City Development Engineer and Community Development Department

J. General

1. Plan and Details for the Entrance Monument are located on sheet 9 of 35.

2. The D.I.A. is revised to indicate additional cost as a result of review comments.

J. General (continued)

3. The comment indicating approval of the Drainage Report is acknowledged.

4. A pavement design for 29 Road and F Road was prepared by Lincoln DeVore and is attached.

5. The comment indicating approval of the Traffic Study is acknowledged.

6. A formal request for credit towards the TCP of $38,654.00 for public improvements is attached.

K. Title Sheet 1 of 35

1. The approval block has been modified as requested.

2. The Trash Enclosure Detail has been moved to sheet 9 of 35. The Masonry Wall Detail has been moved to sheet 9 and 29 of 35.

3. The zoning designation is corrected to "PB".

4. The SSID Manual "Cover Sheet" Checklist has been reviewed. Applicable districts are added to the approval block with names and addresses of the developer as indicated.

L. Site Plan Sheet 2 of 35

1. Bike racks will be added to the project as follows:

   a. Required parking = 405 stalls

   b. Required bike stalls = 405 / 10 = 41 bike stalls

   The site plan has been revised to indicate the number and location of the bike racks.

2. Possible shop entrance symbols have been added to Building Pod No. 2.

3. The accesible parking stall symbol has been added to the legend.

4. The number of accessible parking stalls is based on ADA rules; 4.1.2 accessible sites (5); whiich calls for 9 stalls for a parking lot of 401 - 500 stalls.

   The City's standard accessible parking stalls detail is presented on sheet 34 of 35.

5. Site lighting symbols have been revised to match the legend.

6. The drawings have been revised to indicate the location of "Cart Corals".

7. Maintenance of the fence along the south and east property lines is that of Safeway Inc. or their property Manager.

8. Safeway Inc. has elected to install a 6-foot high masonry fence for the full length of the south and east property lines. All appropriate drawings have been revised to show masonry fence. Sound abatement data for masonry and vinyl structures is attached.

M. Landscape Plan - Overall Layout Sheet 3 of 35

1. See response by Landscape Specialties.

2. See response by Landscape Specialties.

3. The Spill Curb and Gutter Detail located on The Site Specific Details Sheet (sheet 29 of 35) has been modified to show the concrete paver detail as requested.

4. See response by Landscape Specialties.

5. See response by Landscape Specialties.

6. See response by Landscape Specialties.

7. See response by Landscape Specialties.

8. See response by Landscape Specialties.

N. Landscape Plan N.E. Sheet 6 of 35

1. See response by Landscape Specialties.

O. Building Elevations Sheet 9 of 35

1. The colors of exterior materials is identified.

P. Site Lighting Plan Sheet 10 of 35

1. The original site lighting plan indicates and labels the isolux illumination lines. The updated lighting plan further clarifies the illumination levels.

It is Safeway's standard policy to maintain 3 to 5 foot candles minimum at a height of 3 feet, and a 20 foot candle level out to the first row of parking.

2. The site light standard diagrams are revised to a maximum of 25 feet in height. It is Safeway's policy to maintain all parking lot lighting as high as possible for the best distribution of light. Since there are no specific pedestrian areas that are not also parking area, the light standard height will remain at 25 feet.

Q. Final Plat Sheets 11 and 12 of 35

1. The dedication langauge related to drainage easements has been revised as requested.

2. Additional pieces of right-of-way to accomodate handicap ramps and islands adjacent to F Road are shown and defined on the Final Plat plan view.

R. F Road Flowline Plan and Profile Sheet 14 of 35

1. Safeway Inc. has been in direct contact with members of the City Public Works Department and City Management in an effort to mitigate the impact of this requirement. The requirement for detached sidewalk along F Road between 29 Road and the west site driveway will require the relocation of 2 large overhead power poles, 2 signal pull boxes and the signal controller cabinet for the traffic signals at the intersection of 29 Road at F Road. Discussions between Safeway and the City of Grand Junction are ongoing, therefore the plans are not revised at this time. Safeway was assured that public works would not hold up the general permit while working toward a solution of a detached verses attached sidewalk.

R. F Road Flowline Plan and Profile Sheet 14 of 35 (continued)

2. The limits of curb and gutter removal is indicated on the plan by a note located within the upper left corner of the sheet.

3. Additional details of the islands at the site driveways along F Road have been added to the Interior Curb, Gutter and Paving Plan, sheet 21 of 35.

4. A pavement cross section has been added to the sheet.

5. Based on a meeting between City Planning and Engineering staff and LANDesign the handicap ramp on the east curb return of the west site driveway was realigned in a east-west direction. The handicap ramp on the west curb return of the west side driveway is not realigned and remains radial.

6. The cross pan on the east site driveway is identified by the addition of a dimension and leader line.

S. 29 Road Flowline Plan and Profile Sheet 15 of 35

1. Based on meetings between City Planning and Engineering staff and LANDesign this requirement is mitigated.

2. Two of the existing Fir trees designated for removal are dead. The remaining trees designated for removal are within driveway entrances or under proposed pavement.

3. Based on meetings between City Planning and Engineering staff and LANDesign the taper length was reviewed and is approved.

4. A note has been added to the plan as requested.

T. F Road and 29 Road Signage and Striping Plan Sheet 16 of 35

1. All un-neccessary information has been eliminated from the plan as requested.

2. The plan has been modified using CDOT Standard S-627-1 to show typical pavement markings. A pavement markings legend showing dimensions has been added to the plan. The taper striping at the south end of the project has been added.

3. For the proposed new signing, a legend which shows the MUTCD code and a sign legend has been added to the plan.

4. A note requiring the contractor to contact Rick Ripley, City Traffic Services, prior to placement of the traffic controll elements has been added to the plan.

5. The bike lane on 29 Road is revised per the comment. A bicycle detection loop, and new quadrupole loop detector have been added to the plan as required.

6. The note has been added to the plan.

7. The note has been added to the plan.

8. The three diamond symbols have been deleted and three bicycle symbols have been added.

9. The signs have been deleted as requested.

T. F Road and 29 Road Signage and Striping Plan Sheet 16 of 35 (continued)

10. A R3-9 sign has been added at the designated location as requested.

11. All redline plans supplied to LANDesign by the City shall be returned with this response.

U. Interior Signage and Striping Plan Sheet 17 of 35

1. A detailed enlargement of the area in front of the Safeway building has been added to the plan.

2. Extraneous information not directly related to the signage and striping plan has been removed from the plan.

3. The color, size and typical dimensions of all interior striping has been added. Blow-up details have been added where applicable.

4. All interior traffic control signage is detailed on the plan. Stop signs and other traffic controll elements have been added to the plan per the redline drawing provided by the City.

5. Safeway takes great efforts to create as smooth of a surface from the store entrance to the customer's car as possible. The use of any textured surface makes pushing a loaded grocery cart difficult. The drawings have been revised to show colored concrete (red) in the cross walk areas in front of the Safeway Store and in front of Retail "A".

6. See response U. 5 above.

V. Parking Area / Heavy Driving Area Delineation Plan Sheet 17A of 35

1. Sheet 54 was an incorrect cross reference. The information referenced (Structural Pavement Cross Sections Table) has been added to the plan.

W1. Interior Curb, Gutter and Paving Plan Sheet 18 of 35

1. Architectural sheets 2 and 6 of 64 are attached as requested.

2. The "AA" references a parking lot lighting designation. They have been removed from the plan.

3. Based on meetings between City Planning and Engineering staff and LANDesign this requirement is mitigated.

W2. Interior Curb, Gutter and Paving Plan Sheet 19 of 35

1. See response Item W1. - 2.

W3. Interior Curb, Gutter and Paving Plan Sheet 20 of 35

1. See response Item W1. - 2.

2. See response Item M. - 3.

W3. Interior Curb, Gutter and Paving Plan Sheet 21 of 35

1. Based on meetings between City Planning and Engineering staff and LANDesign this requirement is mitigated.

X. Interior Grading Draiange and Erosion Control Plan Sheet 22 of 35

1. The F Road surface drainage does in fact flow into the project site.

2. A 6-foot cross pan is proposed for the east driveway along F Road.

3. A detail cross reference has been added to the plan.

Y. Storm Sewer Plan and Profile Sheet 23 of 35

1. All inlets shall be constructed to City of Grand Junction Standards. The reference for inlets has been modified for clarification.

Z. Storm Sewer Plan and Profile Sheet 24 of 35

1. No response needed.

AA. HANS Drain Plan and Profile Sheet 25 of 35

1. This comment is ackowledged.

BB. Utility Composite Sheet 26 of 35

1. No response needed.

CC. Sanitary Sewer Plan and Profile Sheet 27 and 28 of 35

1. This comment is ackowledged.

DD. Erosion Control Detail Sheet 30 of 35

1. The General Contractor, Francis Constructors, has been notified that they will be responsible for acquiring a "Stromwater Management Permit" and a "Construction Dewatering Permit" as neccessary.

EE. CORPS of Engineers

The comment indicating approval is acknowledged.

FF. City Utility Engineer

1. An approval block for Ute Water is added to the water plans. The City approval block shall remain as connection to the water main shall occurr in the City of Grand Junctions right-of-way.

GG. Central Grand Valley Sanitation District

Utility Composite

1. Safeway acknowledges that the onsite sewer system is private and will assume the resposibility for maintenanace. A note has been added to the plans indicating that all onsite sewer shall be constructed to the District's standards and specifications.

2. A monitoring manhole has been added to the plans. The Distict's and Safeway's ownership boundary is represented at the monitoring manhole.

Utility Composite (continued)

3. Safeway ackowledges that the individual sites may be required to provide grease traps depending on use.

4. Safeway will pay a tap fee for the main store per the District's standard rate schedule. Additional tap fees will be paid as each additional building site is developed.

5. The plans are revised per this request.

6. The plans are revised per this request.

7. The plans are revised per this request.

8. The plans are revised per this request.

9. The plans are revised per this request.

29 Road Sewer Plan and Profile

1. The existing sewer taps along 29 Road have been added to the plan as provided by Westwater Engineering. A note has been added to the plans specifing the type of connection from the new sewer main to the exisiting taps. A note has been added to the plan requiring the contractor to notify adjacent properety owners prior to construction.

2. Additional notes are added to the plan defining the requirement for continuous by-pass pumping. LANDesign has selected to replace the exisiting sanitary sewer along it's existing alignment. This is neccessary to minimize conflicts with other existing utilities located in 29 Road east of the existing interceptor line.

3. A note has been added to the plans regarding the procedure for connection between the existing taps and the new interceptor.

4. A note has been added to the plans regarding damages due to pumping failure and back-ups of live sewage.

5. The contractor has been advised that they are required to submit a written construction plan and schedule to the District prior to construction. The District's Engineer will be present at the preconstruction meeting.

6. The District's Engineer has been contacted and a request for approval of the Extension Agreement including inspection cost has been made.

7. A note has been added to the plans as requested.

8. A note has been added to the plans as requested.

9. The plans are revised per this request.

10. The plans are revised per this request.

11. The plans are revised per this request.

12. The plans are revised per this request.

29 Road Sewer Plan and Profile (continued)

13. The plans are revised per this request.
14. The plans are revised per this request.
15. The plans are revised per this request.
16. The plans are revised per this request.
17. The plans are revised per this request.
18. The plans are revised per this request.
19. The plans are revised per this request.

Sanitary Sewer Plan and Profile for System Within Commercial Center.

1. The plans have been revised to reflect the addition of an monitoring manhole.
2. The plans are revised per this request.
3. The plans are revised per this request.
4. The plans are revised per this request.
5. The plans are revised per this request.
6. The plans are revised per this request.

Miscellaneous Provisions.

1. The District's standard notes are revised as requested.
2. The District's Engineer will be provided the original Application and Agreement for processing.
3. The Benchmark is added to all sheets.
4 The General Contractor has been informed of this requirement.
5. The District's detail sheet is included in the construction plans as sheet 32 of 35.
6. The plans are revised per this request.

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

Sincerely

Monty D. Stroup
Project Manager

MTD 6/14/96

Landscape Specialties
2004 N. 12th Street, Suite #48
Grand Junction, CO 81501

6/6/96

City of Grand Junction
Community Development Dept.
Attn: Mr. Michael Drollinger
250 North 5th Street
Grand Junction, CO 81501

Re: **Safeway Store No. 1533**
29 Rd. & F Rd.
Grand Junction, Colorado

Landscape Plan needs to be revised to reflect detached walk - include streettrees as required and irrigated sod as the groundcover

Dear Michael,

The following items are responses to your letter, dated May 16,1996, concerning the landscape plan development submittal.

M. <u>Landscape Plan-Overall Layout (Phase I)-Sheet 3 of 35</u>

OK 1. Street frontage buffer planting along F Road has been achieved by the combinations of tree types which have low branching structure to accommodate lower visual screening (4 ft. and up). Dense shrub plantings within the perimeter shrub beds will provide good lower screening up to 3-1/2 ft. ht. Due to the limited widths between sidewalk and parking areas and the different watering requirements of shrubs vs. lawn, irrigation division between shrub beds and adjoining lawn areas is critical.

OK 2. Regarding interior parking area landscaping, proper tree distances and spacing is crucial to the long term vitality, health and appearance for these type of trees. As discussed additional trees have been added to the interior parking areas where appropriate. Also, additional trees have been added to the perimeter parking planting beds.

OK 3. The paved overhang detail which occurs in the interior parking planting islands will be shown on the paving plan provided by Landesign.

OK 4. The fencing note has been revised and is shown on the landscape plan.

OK 5. Parking stalls are not shown on the Landscape Plan for purpose of clarity in reading planting labels and notes.

OK 6. Shrubs are not included in landscape islands behind "Retail A" building because of truck turning and visibility.

OK 7. Landscaping that is shown on **<u>Phase I & Phase II - Overall Layout Plans</u>**, show the extent of landscape for each phase. All the landscaping shown on each sheet is to be developed for that particular phase.

OK 8. Signature approval block has been added to each landscape plan.

N. Landscape Plan-N.E.

1. The Landscape Plan is revised to show irrigated sod instead of cobble between the detached sidewalk and F Road. Also two street trees have been added.

OK

If you have any questions, please contact this office.

Sincerely,

Mark Gibbons
Landscape Specialties

June 10, 1996

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

Mr. Mike Wein
Safeway, Inc.
6900 S. Yosemite
Englewood, CO 80112-1412

RE: Grand Junction Store Requirement for Detached Sidewalk

Dear Mr. Wein:

The City of Grand Junction street standards for principal arterials requires a six foot wide detached sidewalk. Patterson Road is classified as a principal arterial and thus the detached walk is required.

The walk may be attached in the area where the right turn pocket will be constructed for entry into the Safeway site, as shown on the submitted improvement plans.

On May 31, 1996 I discussed the detached walk with Monty Stroup of Landesign. He had transmitted a conceptual sketch of the southeast corner of Patterson Road and 29 Road showing the detached walk and its relation to utility poles and the controller cabinet. If relocation of the cabinet is necessary, the work may be done by city forces and billed to you for direct expenses.

Please submit revised plans showing the detached walk as part of the public improvements. If you have any questions, please do not hesitate to call me at 970 244-1591.

Sincerely,

Jody Kliska, P.E.
City Development Engineer

cc: Monty Stroup, Landesign
Michael Drollinger, City Community Development

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

June 14, 1996

Mike Wein
Safeway, Inc.
6900 S. Yosemite
Englewood CO 80112

RE: Administrative Decision - Safeway Cottonwood Centre (Our File #SPR-96-107)

Dear Mr. Wein:

We have reviewed the revised submittal for the above referenced application and have identified a number of outstanding items which remain to be addressed. Once all conditions are satisfied final approval will be issued; the approval becomes a denial if the conditions are not met. Revised plans which address all concerns must be submitted *prior* to issuance of a Planning Clearance and commencement of construction; the other steps necessary prior to and after receiving approval are detailed in this letter. The petitioner must respond to the comments contained herein within 30 days; we would expect that the staff review of the revised plans would be completed within 5 working days.

For your convenience, the outstanding items are generally organized by sheet number as were the original review comments. An "OK" comment means that the item has been satisfactorily addressed. Also, reference should be made to the red-lined set of plans which will be forwarded to LANDesign and which contains additional changes which may or may not be contained in this letter. The red-lined plan set must be returned with the revised plans.

General

#1 OK
#2 The improvements agreement needs to be adjusted to show all 6' wide detached sidewalk, rather than an item for 5' attached sidewalk.
#3 - #5 OK

#6 TCP credit can only be given for the roadway improvements, not sewer and water. Credit may be given for the $85,087.50. Please submit a revised TCP credit request which reflects the correct numbers.

Title Sheet - Sheet 1 of 35

#1 Correct the spelling of "Development" in the title block (misspelled twice).
#2 Correct the dimensions on the masonary wall on Sheet 29 to match those on Sheet 9.
#3;#4 OK

Site Plan - Sheet 2 of 35

#1 Bicycle rack detail was not provided on the plans as originally requested.
#2 - #8 OK

Landscape Plan -Overall Layout (Phase I) - Sheet 3 of 35
Landscape Plan -Overall Layout (Phase II) - Sheet 4 of 35
Landscape Plan N.W. - Sheet 5 of 35
Landscape Plan N.E. - Sheet 6 of 35
Landscape Plan S.W. - Sheet 7 of 35
Landscape Plan S.E. - Sheet 8 of 35

All comments have been satisfactorily addressed on the landscape plans with the exception that all plans must be revised to reflect the detached walk on F Road; street trees as required by Code must be included between the street and the detached walk and irrigated sod provided as the groundcover.

Building Elevations - Sheet 9 of 35

#1 OK

Site Lighting Plan - Sheet 10 of 35

#1 Plan still does not clearly indicate isofootcandle levels (unreadable) and does not include the 0.6 footcandle level as required by Code and previously requested.
#2 OK

Final Plat Cover Sheet - Sheets 11 of 35

#1 Based on discussions with the Grand Junction Drainage District the dedication language for the drainage easements must be modified as follows:

"All Grand Junction Drainage District easements to the City of Grand Junction for the use of the public and to the Grand Junction Drainage District, its successors

and assigns, for the installation, operation, maintenance and repair of Grand Junction Drainage District facilities."

Final Plat - Sheet 12 of 35

#1 Additional ROW provided is inadequate and incorrectly located - please refer to red-lined plat for corrections; use Sheet 21 for reference as to the extent of additional ROW to be dedicated. This change will affect a number of other sheets; make modifications on all applicable sheets.

F Road Flowline Plan and Profile - Sheet 14 of 35

#1 Detached walk required; please modify all applicable sheets to reflect detached walk. Please supply Public Service with a copy of the revised F Road plans. A phone conversation with DaleClawson indicated an easement on the west side of Indian Wash will be required so they can site a pole and guy wire for the relocation of the utility poles.
#2-#4 OK

29 Road Flow Line Plan and Profile - Sheet 15 of 35

#1-#4 OK

F Road and 29 Road Signage and Striping Plan - Sheet 16 of 35

#1 OK
#2 See red-lined plans for bike lane striping comments.
#3; #4 OK
#5 Add loop details (previously provided) to plans as previously requested.
#6-#11 OK

Interior Signage and Striping Plan - Sheet 17 of 35

#1-#3 OK
#4 Please provide sign legend
#5 OK

Parking Area/Heavy Driving Area Delineation Plan - Sheet 17A of 35

#1 Modify note as per red-lined plans. New contract documents have been prepared by the City; please reference latest documents.

Interior Curb, Gutter and Paving Plan - Sheet 18 of 35
Interior Curb, Gutter and Paving Plan - Sheet 19 of 35
Interior Curb, Gutter and Paving Plan - Sheet 20 of 35

Interior Curb, Gutter and Paving Plan - Sheet 21 of 35
Interior Grading, Drainage and Erosion Control Plan - Sheet 22 of 35
Storm Sewer Plan and Profile - Sheet 23 of 35
Hans Drain Plan and Profile - Sheet 24 of 35
Sanitary Sewer Plan and Profile - Sheet 27 of 35
Sanitary Sewer Plan and Profile - Sheet 28 of 35
Erosion Control Detail - Sheet 30 of 35

All previous comments have been adequately addressed

Additional comments are as follows:

1. The mix designs have been forwarded to the city's quality control lab for review. The 75 blow Marshall design mix must be used on the street improvements.

Once the revised plans have been resubmitted to our office and accepted, the petitioner will be responsible for obtaining the signatures of the applicable districts (Ute Water, Central Grand Valley Sanitation, Grand Junction Drainage District) *prior* to the City signing the plans and issuing the Planning Clearance. A minimum of four sets of drawings (two sets will be returned) must be submitted, the petitioner may choose to have additional copies signed since a signed set is required to be kept at the construction site.

As previously mentioned, a Preconstruction Meeting is required prior to commencement of construction; also contact Pubic Works regarding the required permits for work in the public right-of-way.

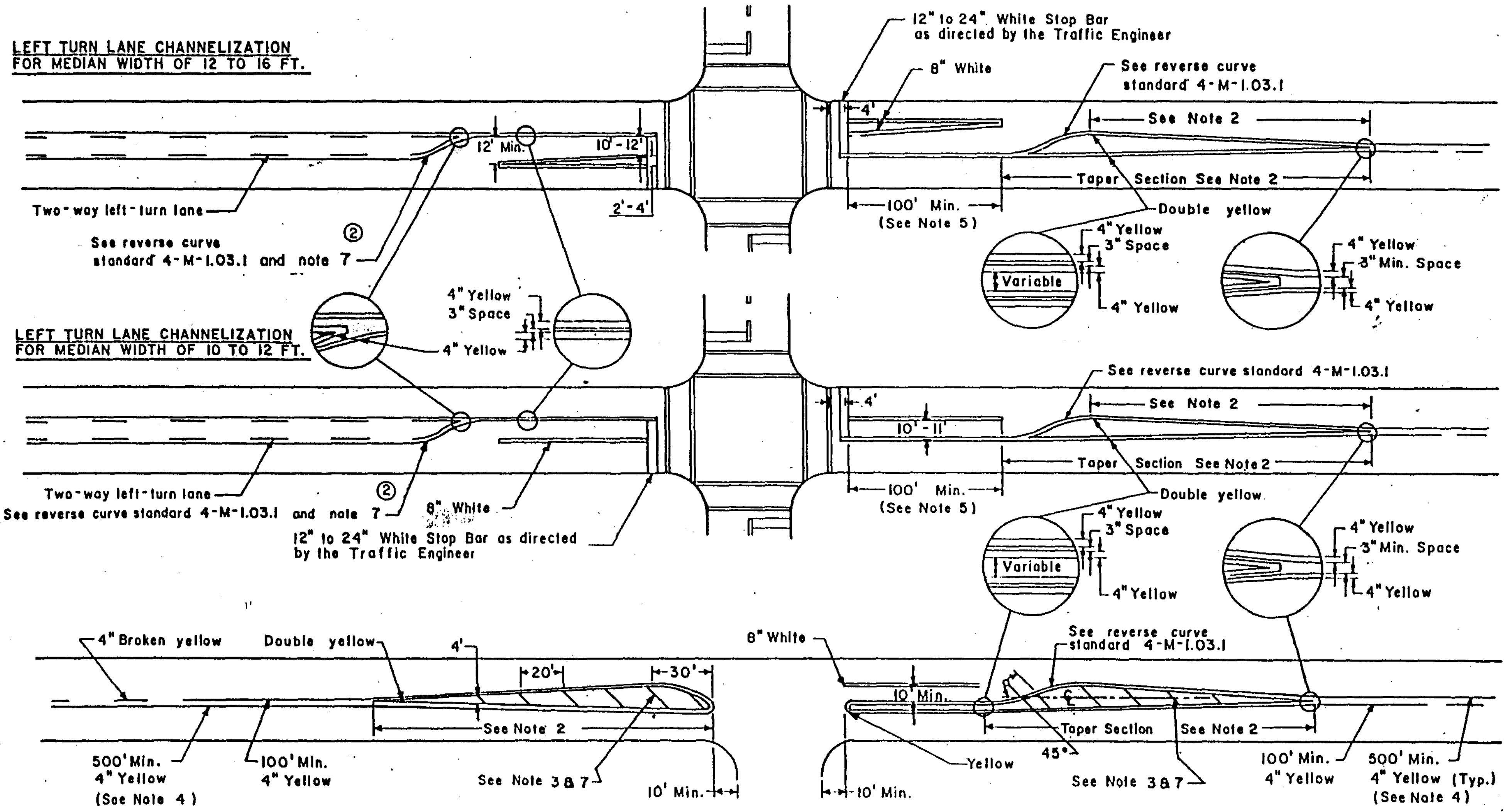
The Development Improvements Agreement must also be completed and approved by our office prior to issuance of a Planning Clearance. Please contact our office regarding the plat recording procedure.

Sincerely yours,

Michael T. Drollinger
Senior Planner

Encl.

cc: Jody Kliska, Development Engineer
Monty Stroup, LANDesign
Gary Harrison, Concepts West



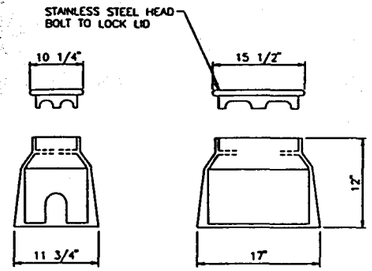
NOTE:
1. All measurements shall be to center of lines.
2. S x W = Taper length; S = 85th percentile speed in M.P.H.; W = Distance traffic is to move over laterally.
3. Crosshatch 12" yellow where 85th percentile speed is 50 M.P.H. and over.
4. In urban areas adjust no-pass zone as required.
5. Actual length of storage shall be determined by Traffic Engineer.
6. The space between double stripes may be increased from 3" to 4" for pavement-tape application by machine which is designed for a minimum 4" between stripes.
7. To be installed only when directed by the Traffic Engineer.

REV. ② 7-89

DESIGN APPROVED / APPROVED FOR DISTRIBUTION 8-28-86	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV 1-77 4-85 1-86
	PAINTED CHANNELIZATION	DRAWING NO. 4-M-1.03

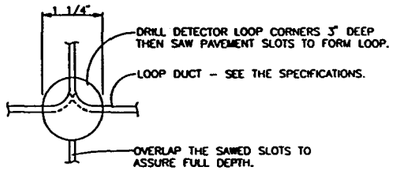
AS CONSTRUCTED			FEDERAL ROAD RECORD NO.	DIVISION	PROJECT NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS	REVISED	VOID	VIII	COLORADO	21688-89402		

LOOP AND CONDUIT INSTALLATION

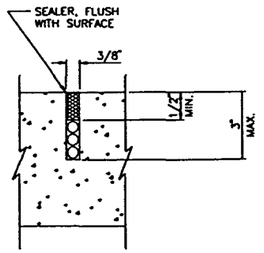


PRECAST PULL BOX

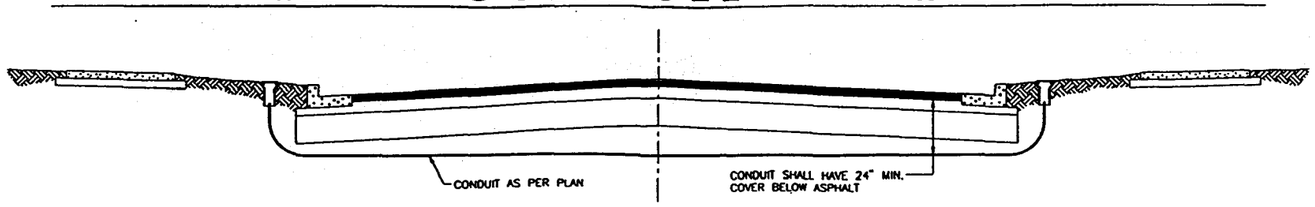
MOLDED FROM A.B.S. THERMOPLASTIC STRUCTURAL MATERIAL



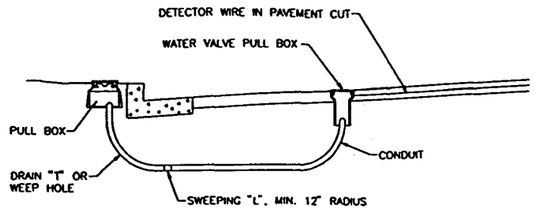
DRILLING DETAIL



SECTION D-D



CONDUIT PLACEMENT UNDER ROADWAY



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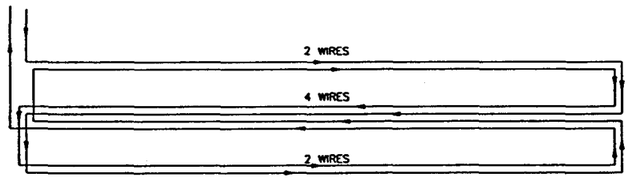
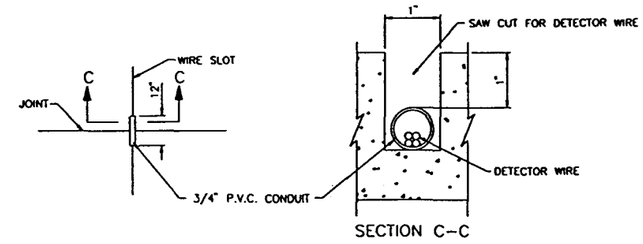
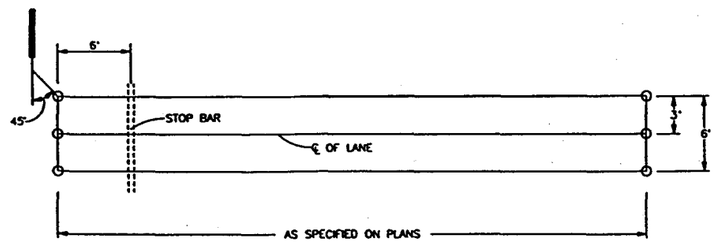


WIRING DIAGRAM FOR QUADRUPOLE DETECTOR (TURNS)



SECTION C-C

DETECTOR WIRE ACROSS JOINTS



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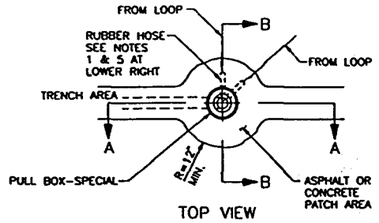
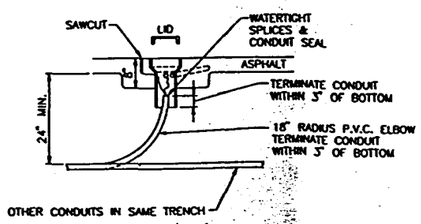
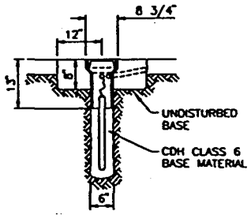


TOP VIEW



SECTION A-A



SECTION B-B

WATER VALVE STEM TYPE PULL BOX

NOTES

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DESCRIPTION	DATE
REVISION 1	
REVISION 2	
REVISION 3	
REVISION 4	

DRAWN BY	C.A.K.	DATE	3/2/93
CHECKED BY	D.T.	DATE	3/2/93
APPROVED BY	D.T.	DATE	3/2/93
FIELD BOOK NO.		PAGE	

SCALE — PLAN: HORIZ. ____ PROFILE: HORIZ. ____ VERT. ____

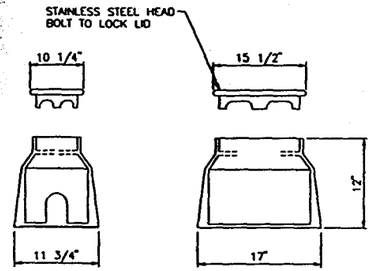
GRAND JUNCTION/MESA COUNTY METROPOLITAN PLANNING ORGINATION

PERMANENT TRAFFIC COUNTERS
Loop and Conduit Installation

SHEET NO. 6 OF 9
FILE NO. TRAFSTD.DWG

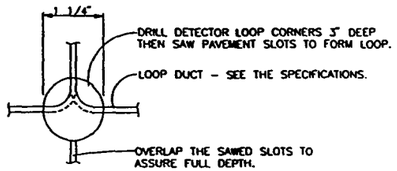
AS CONSTRUCTED			FEDERAL ROAD REGION NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
NO REVISIONS	REVISED	VOID	VIII	COLORADO	21688-89402		

LOOP AND CONDUIT INSTALLATION

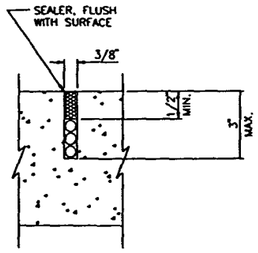


PRECAST PULL BOX

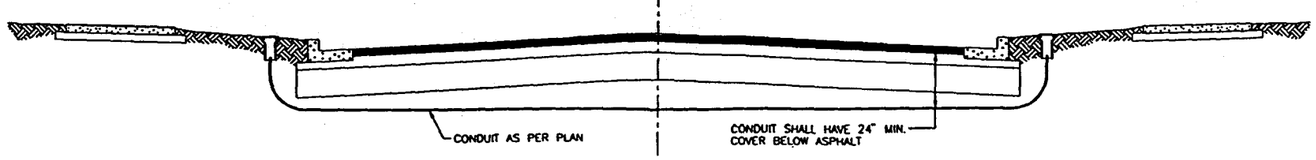
MOLDED FROM A.B.S. THERMOPLASTIC STRUCTURAL MATERIAL



DRILLING DETAIL



SECTION D–D



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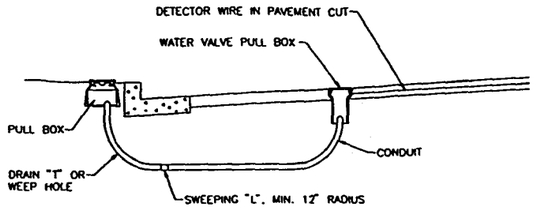

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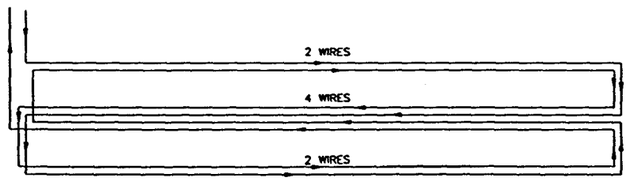

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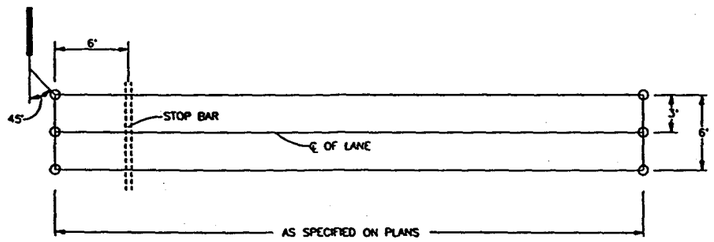

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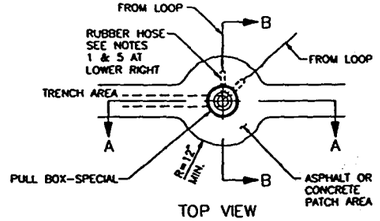
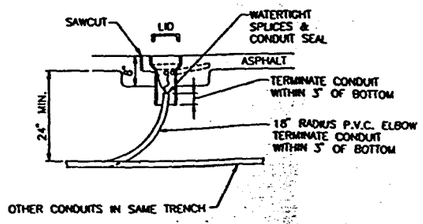
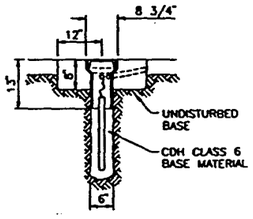


TOP VIEW



SECTION A–A



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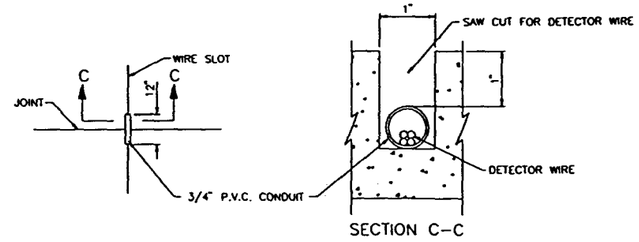

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SCALE: PLAN HORIZ. ____ PROFILE HORIZ. ____ VERT. ____

GRAND JUNCTION/MESA COUNTY
METROPOLITAN PLANNING ORGINATION

PERMANENT TRAFFIC COUNTERS
Loop and Conduit
Installation

SHEET NO. 6 OF 9
FILE NO. TRAFSTD.DWG

SAFEWAY

-street lighting @ intersection

- Street imp.
  29 Road to Orchard
  on east side

- Weight restrictions on bridge

list of prop owners

- notice

HOSKIN, FARINA, ALDRICH & KAMPF

Professional Corporation

ATTORNEYS AT LAW

200 Grand Avenue, Suite 400
Post Office Box 40
Grand Junction, Colorado 81502

Telephone (970) 242-4903
Facsimile (970) 241-3760

222 West Main Street
Rangely, Colorado 81648

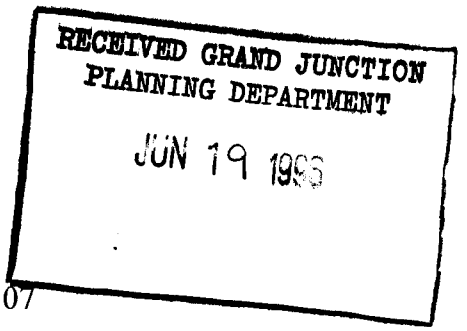
Gregory K. Hoskin
Terrance L. Farina
Frederick G. Aldrich
Gregg K. Kampf
Curtis G. Taylor
David A. Younger
David M. Scanga
Michael J. Russell
John T. Howe
Matthew G. Weber
John A. Siddeek

William H. Nelson
(1926-1992)

June 18, 1996

VIA FACSIMILE 244-1599
AND FIRST CLASS MAIL

Michael T. Drollinger, AICP
Senior Planner
City of Grand Junction
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501



Re: Safeway Cottonwood Centre
Grand Junction Planning File No. SPR-96-107

Dear Mr. Drollinger:

We write to you on behalf of this firm's clients, Cris Mar Homeowners Association and Earl Isom regarding the above-referenced development.

On June 14, 1996 you issued an Administrative Decision indicating that once all conditions specified in the decision were satisfied, final approval would be issued.

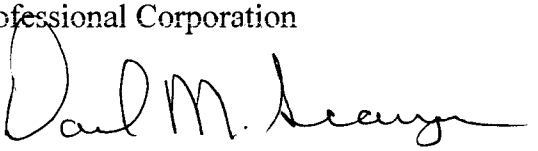
The Cris Mar Homeowners Association and Earl Isom hereby appeal the Administrative Decision and request that the appeal be heard by the City of Grand Junction Planning Commission.

The reasons for the appeal are that the plan as submitted does not meet the criteria set forth in the Grand Junction Zoning and Planning Code section 4-14-4. In particular, the proposed development does not meet standards of the City for development and does not adhere to basic land use, design and city planning principles. We have significant concerns about many aspects of the development including, but not limited to, traffic flows and needed improvements on 29 Road and F Road and buffering of the development from adjoining neighbors.

We ask that the appeal be heard by the City Planning Commission. I will out of the office July 2-4, 1996 and request that this matter not be scheduled before the Planning Commission for a meeting on those dates.

Sincerely,

HOSKIN, FARINA, ALDRICH & KAMPF
Professional Corporation



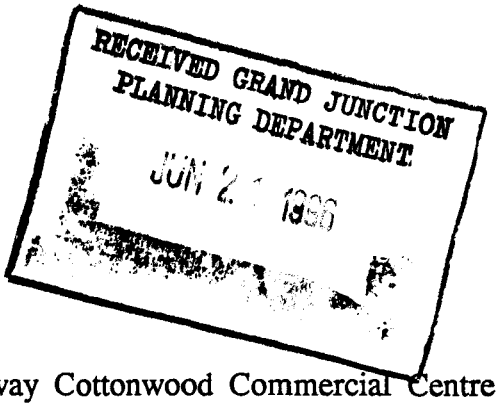
DAVID M. SCANGA

DMS:sld
cc: Earl Isom
Cris Mar Homeowners Association

WestWater Engineering
Consulting Engineers

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

June 19, 1996



Monty Stroup
LANDesign Ltd.
259 Grand Ave.
Grand Junction, CO 81501

RE: Review Comments on Resubmittal of Safeway Cottonwood Commercial Centre - Central Grand Valley Sanitation District

Dear Monty,

We have reviewed the Safeway Cottonwood Commercial Centre resubmittal for the Central Grand Valley Sanitation District and have the following comments:

1. We have met with Kerry Stanley, the subcontractor for Francis Construction that will be performing the utility work, regarding the construction plan and sequencing of construction on the 29 Road interceptor replacement. We would still request that a pre-construction meeting be held on-site prior to the work, to again review the proposed construction plan and sequencing.

2. The District's standard detail sheet should be provided in lieu of the detail sheet submitted, and is available upon request (see original comment #5).

3. The outlet pipe at new MH-NL32 should be changed from 10-inch to 8-inch diameter PVC to connect to the existing 8-inch concrete pipe with a caulder coupling encased in concrete as shown on the profile of Sheet 27. This will avoid any offset at the connection between the dissimilar pipe if a 10 inch outlet pipe was installed out of the manhole that could restrict the flow and become a maintenance problem. The invert of new MH-NL32 should be a smooth transition from the 10-inch inlet to the 8-inch outlet pipe. The District has no immediate plans to replace this section of the 29 Road interceptor that will require breaking out the invert of MH-NL32 to accommodate a 10-inch outlet pipe in the future; however, this future work out-weighs the potential maintenance concerns with the direct connection of a larger pipe to a smaller diameter pipe.

4. The 10 inch diameter drop inlet pipe and fittings at new MH-NL33 is acceptable. Because the connection between the existing 8-inch pipe to the new 10-inch pipe will not impede the flow, a flex seal or caulder coupling transition may be used to

connect the existing 8-inch concrete pipe to the new 10-inch PVC pipe located upstream from the manhole drop fittings. This will allow the District to connect directly to the piping outside the manhole in the future without having to remove the drop piping when the interceptor is replaced. The maintenance concerns of having different pipe diameters at the connection between dissimilar pipes should be minimal, since going from the smaller existing 8" concrete sewer line to the larger new 10" PVC sewer line should not impede the flow. For both connections to the existing pipe at MH-NL32 and MH-NL33, the flow line inverts of the new pipe should match those of the existing pipe at each connection between dissimilar pipe materials and pipe diameters (MH-NL33 only).

Please revise the plans and submit five sets of Sheets 1, 2, 26 thru 28, and the appropriate Sheet 32 for the District's signature. We will retain two sets for the District and return the remaining 3 sets to you for distribution. If additional signed sets are needed, please submit the appropriate number of sets required for additional distribution. Please also have the Contractor notify the District at least 48 hours prior to commencement of construction once the plans have been approved by the City of Grand Junction.

Sincerely,

Stephen T. LaBonde
District Engineer

STL/sc

cc: Chris Shaffer, Central Grand Valley Sanit. Dist.
Michael Drollinger, City of Grand Junction
Stan Kaiser, Francis Construction
Kerry Stanley, Stanley Construction

June 20, 1996

Grand Junction Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501

Attn: Mr. Michael Drollinger

Re: Safeway Cottonwood Centre, response to review comments dated June 14, 1996, File (#SPR-96-107)

Dear Mr. Drollinger;

In response to the above referenced review comments we offer the following:

GENERAL:

2. The improvements agreement list detail has been revised. The reference to 5-foot attached sidewalk has been deleted. The estimated quantity for 6-foot detached sidewalk has been increased. A copy of the revised exhibit is attached.

6. A revised TCP credit request for roadway improvements only is attached.

Title Sheet 1 of 35:

1. The spelling error has been corrected.

2. The dimensions of the masonry wall have been corrected.

Title Sheet 2 of 35:

1. A bike rack detail has been added to sheet 9 and 17 of 35.

Site Lighting Plan 10 of 35:

1. As requested by Jody Kliska a blueline of the plan is attached showing spot foot candle calculations.

Final Plat Cover Sheet 11 of 35:

1. The dedication language for the drainage easement has been revised as requested.

Final Plat Sheet 12 of 35:

1. Additional ROW along F Road at the entrance ways has been delineated as per the redline drawings.

F Road Plan and Profile Sheet 14 of 35:

1. The walk way along F Road has been revised to meet current City Standards for the Principal Arterial Section as required by the City staff.

F Road and 29 Road Signage and Striping Plan Sheet 16 of 35:

2. The plan has been revised per the red-line comments.

5. Loop details have been added to the plans.

Interior Signage and Striping Plan Sheet 17 of 35:

4. A sign legend has been added to the plan.

Parking Area/Heavy Driving Area Delineation Plan Sheet 17A of 35:

1. The Plans have been modified per the red-line drawings. A note has been added re: the latest City specifications.

Please contact our office if you have any further questions.

Sincerely

Monty D. Stroup
Project Manager

LANDesign
ENGINEERING • SURVEYING • PLANNING

June 20, 1996

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

Attn.: Mr. Michael Drollinger.

Re: **(REVISED) Safeway Cottonwood Centre, TCP Credit Request, File #SPR- 96-107.**

Dear Mr. Drollinger;

For and on behalf of Safeway Inc. we are requesting that credit be given towards the (TCP) Traffic Capacity Payment in the amount of $38,654.00 for the Safeway development as a result of proposed public improvements to 29 Road and F Road. The estimated cost of the public improvements is $85,795.40 and shall be completed by Safeway with the development of this project. Further we are requesting that the residual amount, after the credit, of $47,141.40 be applied towards the (TCPs) for the future development of Lots 2, 3, 4 and 5 of the Safeway Cottonwood Centre Subdivision.

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

Sincerely

Monty D. Stroup
Project Manager

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

C. JOSEPH CROKER, P.C.

ATTORNEYS AT LAW

C. JOSEPH CROKER•
CHRISTOPHER G. MCANANY
JERROLD R. KRIST•

•also admitted in Utah

600 ALPINE BANK BUILDING
225 NORTH FIFTH STREET
P.O. BOX 2202
GRAND JUNCTION, COLORADO 81502-2202
(970) 241-1616
TELECOPIER (970) 241-9579

MOAB, UTAH, OFFICE
8 SOUTH 100 EAST
MOAB, UTAH 84532
(801) 259-5401

June 24, 1996

RE: MICHAEL D.
DAN W.

John Shaver, Esq.
Assistant City Attorney
City Hall
250 North Fifth Street
Grand Junction, CO 81501

Re: Grand Junction Drainage District/Safeway Cottonwood Centre (Hans Drain)

Dear John:

I would like to first thank you for providing me with an opportunity to meet with you and Michael Drollinger regarding proposed language for the dedication of drainage easements on city plats relative to the Safeway Cottonwood Centre property, which language is intended by the city to be utilized on all plat submittals.

As I indicated in our conversation, the question is not territorial in nature in that the district in no way wishes to inhibit or interfere with the city's desire to obtain a public-use easement upon plat submissions; however, the drainage district, through its board of directors, is required to comply with CRS 37-31-101, *et seq.*, as amended, in that the enabling statute requires that control authority and full obligation as to the maintenance of the drainage system in the valley rests upon the board of directors of the Grand Junction Drainage District.

In my opinion, for the district to be in full compliance of its statutory authority and obligation, it would be desirable to bifurcate the easements, permitting the city to obtain its desired easement for the use of the public and, by separate document, allowing the Grand Junction Drainage District to obtain its easement "through, over and across the owner's premises for the cleaning, maintenance, replacement, adjustment or deepening of," in this case, the drain tile line. In addition, the

easement agreement of Grand Junction Drainage District holds the titleholder responsible for damage to the drain line as a result of the general negligence of the titleholder. The district further requires reasonable rights of ingress and egress to bring necessary equipment to the easement and that the easement not be overburdened by the erection of improvements including fences, which are a continuous source of dispute with members in the district.

The concept of being co-grantees of separate easements in a single document could, conceivably, cause entanglements between the city and the Grand Junction Drainage District upon the modification or vacation of the easement or confusion upon the titleholder if the titleholder does not recognize that, in effect, there are two separate and distinct easements upon the titleholder's property, one of which might be vacated without the benefit of the vacation of the other. I do not see a conflict, although I am able to ascertain that a potential problem could exist if the district is operating within its rights granted by the easement and if it were deemed by the city that the exercise of those rights might interfere with the "use of the public." It would seem that a singular document granting two separate and distinct easements would require both grantees to sign off on any modification or termination of one or both of the easements in place.

In summary, the primary concern of the Grand Junction Drainage District is that it not be in violation of its obligations under Title 31 to independently control and govern the operation and maintenance of the drainage system as required by statute.

The language "all GJDD Easements to the City of Grand Junction for the use of the public and to the Grand Junction Drainage District, its successors and assigns, for the installation, operation, maintenance and repair of GJDD facilities" does not afford indemnification to the district for damage to the pipeline, reasonable ingress and egress to the drainage easement or the prohibition of overburdening the easement with fences and structures. The safety considerations, of course, speak for themselves.

It would seem prudent for the district and city to take their easements by separate document so that autonomy exists between the city and the district as to future modification or

termination of the respective interests. Please let me know your thoughts in this regard.

Very truly yours,

C. JOSEPH CROKER, P.C.

By _____
C. Joseph Croker

cmb
pc: Mr. John L. Ballagh

Via FAX

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

June 25, 1996

Mike Wein
Safeway, Inc.
6900 S. Yosemite
Englewood CO 80112

RE: Revised Plans - Safeway Cottonwood Centre (Our File #SPR-96-107)

Dear Mr. Wein:

We have reviewed the revised submittal for the above-referenced application and have identified a few outstanding items which remain to be addressed. We suggest that the revised sheets be submitted to our office for review and approval prior to submittal of the final plan sets.

Also, reference should be made to the red-lined plan which will be forwarded to LANDesign and which contains additional changes which may or may not be contained in this letter. The red-lined plan must be returned with the revised plans.

Site Lighting Plan - Sheet 10 of 35

#1 Lighting Plan meets minimum illumination requirements. Please include a version reduced to 24" X 36" (use multiple sheets if necessary) and properly labeled and indexed and include in final plan set.

F Road and 29 Road Signage and Striping Plan - Sheet 16 of 35

#2 See red-lined plan for bike lane striping comments.

#5 Refer to and include standard city detail for permanent traffic counters loop and conduit installation (see attachment).

The City's quality control lab has reviewed the mix designs; comments are included on the attached memo.

As previously mentioned, once the revised plans have been resubmitted to our office and accepted, the petitioner will be responsible for obtaining the signatures of the applicable districts (Ute Water, Central Grand Valley Sanitation, Grand Junction Drainage District) *prior* to the City signing the plans and issuing the Planning Clearance. A minimum of four sets of drawings (two sets will be returned) must be submitted, the petitioner may choose to have additional copies signed since a signed set is required to be kept at the construction site. Also, a Preconstruction Meeting is required prior to commencement of construction; Pubic Works shall also be contacted regarding the required permits for work in the public right-of-way.

The Development Improvements Agreement must also be completed and approved by our office prior to issuance of a Planning Clearance. Please contact our office regarding the plat recording procedure.

Encls.

Sincerely yours,

Michael T. Drollinger
Senior Planner

Encl.

cc: Jody Kliska, Development Engineer
Monty Stroup, LANDesign (w/encl.)
Gary Harrison, Concepts West

PLANNING COMMISSION STAFF REPORT

FILE: #SPR-96-107

DATE: July 2, 1996

STAFF: Michael T. Drollinger

REQUEST: Site Plan Review - Safeway Cottonwood Centre

LOCATION: SE Corner F Road and 29 Road

APPLICANT: Safeway, Inc.
6900 S. Yosemite
Englewood CO 80112

EXECUTIVE SUMMARY:

This is an appeal of an administrative approval of a Site Plan Review application for the Safeway Cottonwood Centre located at the southeast corner of F Road and 29 Road. The project consists of approximately 80,000 square feet of retail space to be developed in two phases on a site of 11 acres. The petitioner has complied with staff requirements. The Cris Mar Homeowners Association and Earl Isom are appealing the staff approval claiming that the plan as submitted does not meet the criteria set forth in Section 4-14-4 of the Zoning and Development Code.

EXISTING LAND USE: Vacant/Single Family Residential

PROPOSED LAND USE: Retail

SURROUNDING LAND USE:

NORTH:	Commercial (Gas Station/Convenience Store)/Single Family Residential
SOUTH:	Single Family Residential
EAST:	Single Family Residential
WEST:	Single Family Residential/Vacant

EXISTING ZONING: PB (Planned Business)

SURROUNDING ZONING:

NORTH:	PB (Planned Business)/R2T(County)
SOUTH:	R2 (County)
EAST:	R2 (County)

WEST: RSF-4

RELATIONSHIP TO COMPREHENSIVE PLAN:

The draft City of Grand Junction Growth Plan identifies the subject parcel in the "Commercial" land use category. The project is in general conformance with the draft Growth Plan.

STAFF ANALYSIS:

Extensive attachments are provided with this staff report to detail the progress of this project from submittal to the administrative approval. The project narrative is provided which details the scope and design of the project along with reduced copies of the entire plan set. A copy of the traffic study is attached which details the traffic impact of the proposed development on the adjoining roadway network. The study also recommends certain improvements to the roadway network to accommodate the Cottonwood Centre traffic. Some of the study recommendations have been modified by staff and are reflected in the site plan design. Please refer to the index of attachments to locate the items described above.

To date the petitioner has resolved all outstanding issues with the exception of the items identified in a June 25, 1996 letter to the applicant which is attached. Revised plans addressing these items have been resubmitted by the applicant and upon preliminary review it appears that the items have been satisfactorily addressed although staff has not yet had an opportunity to review the plans in depth.

The approval of the Safeway Centre is for Phase I and Phase II. Any changes to the Phase II design prior to development of that phase may require a Site Plan Review. Uses which require a Special or Conditional Use Permit in a B-3 zone district will require that the appropriate permit be obtained prior to development.

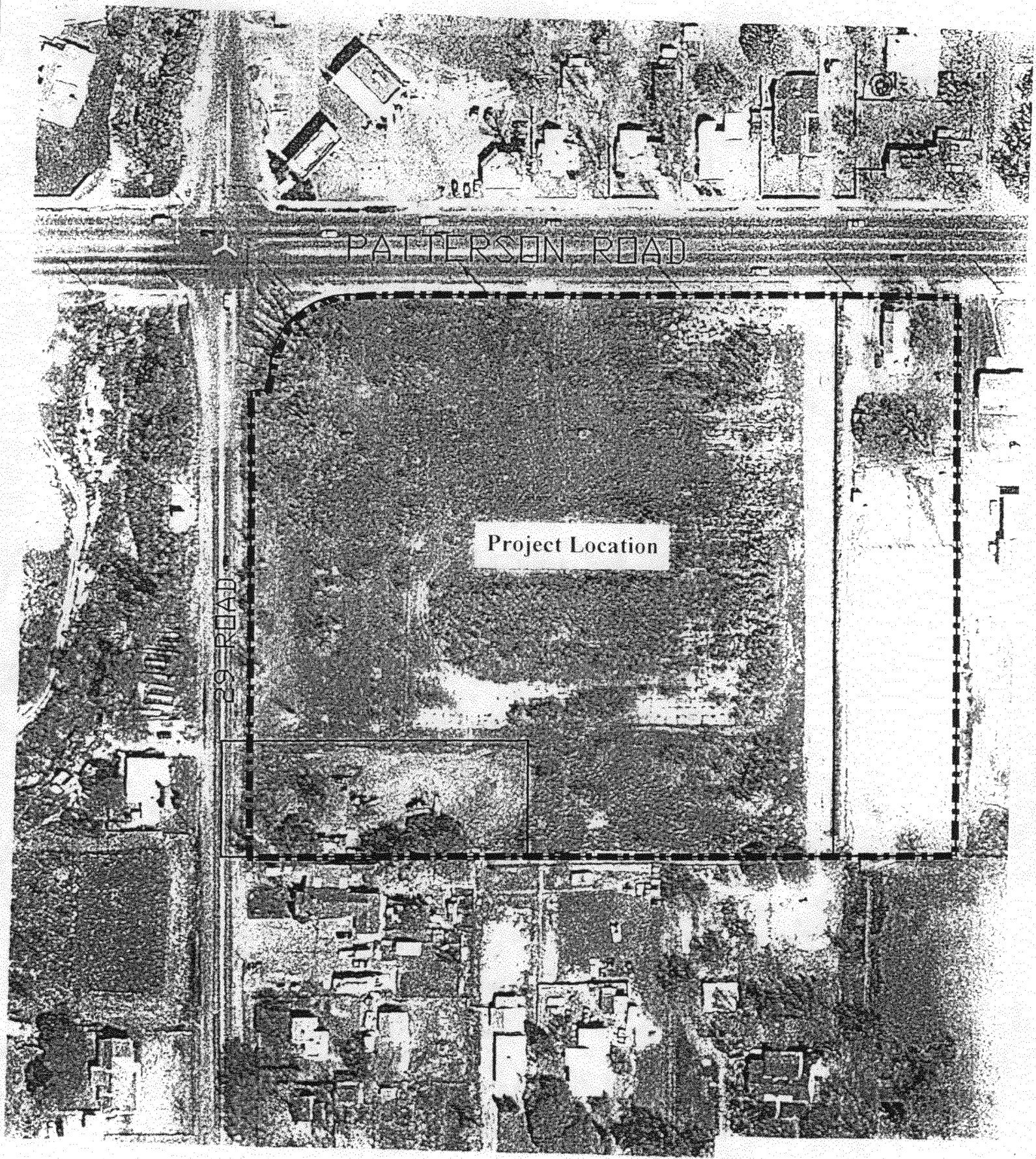
STAFF RECOMMENDATION:

Staff recommends approval of the application subject to the conditions and procedures detailed in the administrative decision which is attached to this staff report.

RECOMMENDED PLANNING COMMISSION MOTION:

Mr. Chairman, on item SPR-96-107, a Site Plan Review for the Safeway Cottonwood Centre, I move that we approve the application.

h:\cityfil\1996\96-107.srp



AERIAL PHOTOGRAPH

N

MS-96-53
Safeway Cottonwood Centre
Site Plan Review

Rec'd @ CD
7-3-96

Michael Drollinger
Community Development Department
250 N. 5th St.
Grand Jct., Co 81501

July 3, 1996

Dear Mr. Drollinger,

I am unable to attend the Planning Commission meeting on July 9,1996 concerning the Safeway/Cottonwood Centre application, but I would like to make my concerns known to the members of the Commission.

I am not against the proposed development. I do have some concerns about the proposed details in the proposal that impact safety and neighborhood values.

My concerns are as follows:

1. No left turns should be allowed onto Patterson Road from the Safeway complex. The current plans show a small concrete barrier that is supposed to stop left turns. I don't believe this will prohibit left turns when people get frustrated at the long delays in entering traffic. I recommend a concrete barrier down the center of Patterson.

2. No left turn should be allowed from Patterson into Safeway. This is also a safety problem. Left turns into Safeway by the traffic traveling east will be in direct conflict with westbound traffic attempting to turn left onto Partee Avenue.

3. The eastern most driveway on the Safeway plans should be eliminated. This is a safety problem for the people entering and leaving Isom's Upholstery Shop to the east of Safeway. The tall cement block fence will block the view of traffic for the people in both driveways and there is a high potential for numerous accidents.

4. No building should be over one story high. This facility should blend with the surrounding neighborhoods. This was the main theme of the Mesa County Planning Commission meeting of January 11, 1979 when the original zoning occurred.

5. Uses should be limited to the list attached to the original meeting minutes of January 11, 1979 (attached). I also recommend that liquor and wine be eliminated from the list. We have a liquor store east of 30 Road (3026) on Patterson so there is no need for another one a mile away.

6. Building materials for the various structures should be limited to those normally associated with house construction. We don't want all glass and steel structures or structures that don't blend and compliment the surrounding houses.

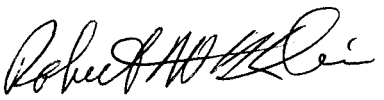
7. No drive-through businesses should be allowed. This tends to attract more than the normal amount of traffic and is not needed in this shopping facility. Again, safety and compatibility are of the primary concern.

8. A sidewalk should be constructed from Patterson Road to Orchard Avenue on the east side of 29 Road for the school children walking to Bookcliff Middle School and for pedestrians in general. This should also include a pedestrian bridge across the Grand Valley canal. The current plans call for a sidewalk on the east side only along the Safeway property. This will force the children to cross 29 Road at the end of the sidewalk to gain access to the current pedestrian walk way on the west side of the road. They will then have to cross 29 Road a second time at Orchard Avenue to walk to Bookcliff school. This sidewalk and bridge should be a cooperative effort between the City, County, and Safeway.

9. The traffic lights at 29 and Patterson should be programmed so that when pedestrians have a walk light ALL vehicle traffic is stopped in ALL directions. When the vehicles have a green light pedestrians are not allowed to walk. Vehicles MUST not be allowed to turn right on a red light. Every day someone comes close to being hit at this intersection from vehicles turning right on red and turning left when pedestrians are crossing.

Thank you for the opportunity to express my concerns. I know that the Commission will consider these items and my neighbors will elaborate at the public meeting.

Sincerely,



Robert W. Kline
2908 Bonita Ave.
Grand Junction, CO 81504
243-2531

Following is a list of proposed allowed uses for Cottonwood Corners neighborhood shopping center:

FOOD AND FOOD SERVICE
- Supermarket
- Restaurant without liquor
- Ice cream parlor

GENERAL MERCHANDISE
- Variety store

CLOTHING AND SHOES
- Ladies' specialty
- Ladies' ready-to-wear

DRY GOODS
- Yard goods

FURNITURE
- Radio, TV, hi-fi

OTHER RETAIL
- Hardware
- Drugs
- Cards and gifts
- Liquor and wine

FINANCIAL
- Banks

OFFICES
- Medical and dental
- Real estate

SERVICES
- Beauty shop
- Barber shop
- Cleaners and dyers
- Coin laundries
- Service station

SCOTIABANK

THE BANK OF NOVA SCOTIA
580 CALIFORNIA STREET
SUITE 2100
SAN FRANCISCO, CA 94104

FAXCOM MESSAGE

DATE: JULY 10, 1996

TO:	ATTENTION	MICHAEL T. DROLLINGER	PHONE NO.
	COMPANY	GRAND JUNCTION COMMUNITY DEVELOPMENT	FAXCOM NO. 970-244-1599
	ADDRESS	GRAND JUNCTION, COLORADO	
FROM:		VINCENT R. INOCENCIO	PHONE NO. 415-986-1100
	BRANCH/DEPT.-	OPERATIONS	FAXCOM NO. 415-397-0791
NUMBER OF PAGES INCLUDING THIS: TWO		IF RECEIVED INCOMPLETE-PLS. CALL:	PHONE NO. 415-986-1100

REMARKS:

AMENDMENT TO OUR IRREVOCABLE STANDBY LETTER OF CREDIT # S007/81695/96.

ORIGINAL WILL BE FORWARDED TO YOUR ATTENTION TODAY VIA FEDEX.

PLEASE DON'T HESITATE TO CALL ME IF YOU HAVE ANY QUESTION.

REGARDS,

V. R. INOCENCIO

SR. OPS. OFFICER

PREPARED_____ AUTHORIZED_____

FAX.WK1

1380818 (01/92)

Scotiabank
THE BANK OF NOVA SCOTIA

81695 - San Francisco Agency
BRANCH

July 10, 1996
DATE OF ISSUE

AMENDMENT TO LETTER OF CREDIT	ISSUING BANK'S NO. S007/81695/96	ADVISING BANK'S NO.
ADVISING BANK	APPLICANT Safeway Inc. Fourth & Jackson Streets Oakland, CA 94660	
BENEFICIARY Grand Junction Community Development 250 North Fifth Street Grand Junction, CO 81501-2668	AMOUNT USD132,473.45	DATE OF ISSUE May 14, 1996
	THIS AMENDMENT IS TO BE CONSIDERED AS PART OF THE ABOVE LETTER OF CREDIT AND MUST BE ATTACHED THERETO	

DEAR SIR(S)

THE ABOVE MENTIONED CREDIT IS AMENDED AS FOLLOWS:

1) Amount increased by USD6,587.70 From USD132,473.45 To USD139,061.15 (One Hundred Thirty Nine Thousand Sixty One Dollars & 15/100 United States Dollars) To cover cost of travel to San Francisco, California in the event of draw.

2) Delete in its entirety Paragraph 2, item 2.

3) Insert the following in Paragraph 2, item 2:

A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway, Inc. has failed to complete the improvements required in connection with the Safeway Project - S E corner 29 Road and F Road.

Except so far as otherwise expressly stated this documentary credit is subject to the Uniform Customs and Practice for Documentary Credits (1993 Revision) International Chamber of Commerce Publication No. 500.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED

THE ADVISING BANK IS REQUESTED TO NOTIFY THE BENEFICIARY OF THIS AMENDMENT	ADVISING BANK'S NOTIFICATION
YOURS FAITHFULLY	
AUTHORIZED SIGNATURE / AUTHORIZED SIGNATURE	REMARKS, PLACE, DATE, NAME AND SIGNATURE OF THE ADVISING BANK

ORIGINAL

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

July 10, 1996

Grand Junction Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attn: Mr. Michael T. Drollinger
Senior Planner

Our Standby Letter of Credit Number S007/81695/96 issued in your favor for the account of Safeway Inc.

Gentlemen:

Please find attached our amendment to the above subject Letter of Credit increasing the amount from USD132,473.45 to USD139,061.15 and also changing some of the language of the Letter of Credit itself.

Please acknowledge receipt by signing on the copy of this letter.

Sincerely,

Vincent R. Inocencio
Senior Operations Officer

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

May 14, 1996

Michael T. Drollinger
Senior Planner
Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Dear Michael,

Please find enclosed our Letter of Credit in the amount of $132,473.45 related to the Safeway Cottonwood Centre.

Sincerely,

John A. Quick

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

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

February 26, 1997

Attn: Mr. Michael T. Drollinger
Senior Planner

Our Standby Letter of Credit number S026/81695/97 for USD190,000.00

Gentlemen:

Please find attached our above subject Letter of Credit issued in your favor for the account of Safeway Inc.

This replaces our Letter of Credit Number S007/81695/96 in the amount of USD132,473.45 dated May 14, 1996, subsequently amended to USD139,061.15 on July 10, 1996.

Accordingly, please forward to us the original of the above Letter of Credit and the amendment for cancellation.

If you have any question or should you need additional information, please do not hesitate to call the undersigned.

Very Truly Yours,

Vincent R. Inocencio
Sr. Operations Officer

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

Irrevocable Standby Letter of Credit

February 26, 1997

Grand Junction Community Development Dept.
250 North Fifth Street
Grand Junction, Colorado 81501-2668

Attention: Michael T. Drollinger, Senior Planner

Re: IRREVOCABLE STANDBY LETTER OF CREDIT NO.S026/81695/97 FOR USD190,000.00 ISSUED BY THE BANK OF NOVA SCOTIA, SAN FRANCISCO AGENCY

Gentlemen:

We hereby open our Irrevocable Standby Letter of Credit No.S026/81695/97 (the "Credit") in your favor for drawings up to the aggregate amount of USD$190,000.00 (One Hundred and Ninety Thousand and 00/100 United States dollars) effective immediately at our office at 580 California Street, 21st Floor, San Francisco, California 94104, for the account of Safeway Inc., 4th & Jackson Street, Oakland, California 94660.

We hereby undertake to honor you sight draft(s) drawn on us bearing upon its face the clause "Drawn under letter of credit No. S026/81695/97 dated February 26, 1997, accompanied by the following documents.

1. This Credit

2. A signed statement on the Grand Junction Community Development Department letterhead, signed by an authorized official of Grand Junction Community Development Department stating that Safeway Inc has failed to complete the improvements required in connection with the Safeway Project - SE Corner 29 Road and F Road.

This forms part of the Bank of Nova Scotia San Francisco Agency Irrevocable Standby Letter of Credit No. S026/81695/97 for USD 190,000.00

The amount of each draft which is negotiated pursuant to this Credit, together with the date of negotiation, must be endorsed on the reverse side of the Credit.

We hereby agree with you that drafts drawn under and in compliance with the terms of this Credit will be duly honored by us if presented at this office or by registered mail on or before the expiration date of February 26, 1998 or any extended date, it being a condition of this Credit that it shall be automatically extended without written amendments for additional periods of Ninety (90) days from this or any future expiration date unless at least Thirty (30) days prior to such date we shall notify you in writing by certified mail at your above address that we elect not to renew this Credit for such additional period.Draft presentation before no later than 9:00 a.m. Pacific Standard Time on any business day shall be honored before 5:00 p.m. Pacific Standard Time on the same business day by wire transfer in immediately available funds to any account designated by you (or any other reasonable means specified by you). Draft presentation after 9:00 a.m. Pacific Standard Time and before 5:00 p.m. Pacific Standard Time, on any business day shall be honored on the following business day in immediately available funds to any account designated by you (or any other reasonable means specified by you). As used in this Credit, the term "business day" means a day other than Saturday, Sunday or any day in which banking institutions in the State of California are authorized or required by law to close.

This Credit may be amended to increase or decrease the amount that Beneficiary is entitled to draw hereunder if the Bank delivers (1) an amendment to this Credit to such effect or (ii) an Amended and Restated Irrevocable Letter of Credit in the form of this credit and upon delivery of this Credit for cancellation.

This Credit is governed by the Uniform Customs and Practice for Documentary Credits, 1993 revision, ICC Publication No. 500. This Letter of Credit shall not be transferable and it shall be governed by the laws of the State of California.

Very truly yours,

Vincent Inocencio
Sn. Operations Officer

Cecilia Bernardo
Assistant Agent

M:\safsto\97S026.LC

TO: File
From: Michael T. Drolllinger
Re: Improvements Agreement Check - Safeway

Please note that the improvements guarantee in the amount of $900 (check #10875 from Concepts West Architecture was NOT deposited and was destroyed after the project was closed out.

Scotiabank
THE BANK OF NOVA SCOTIA

San Francisco Agency, 580 California Street, Suite 2100, San Francisco, CA 94104
Mailing Address, P.O. Box 3716, San Francisco, CA 94119
Tel: (415) 986-1100 Fax: (415) 397-0791 Telex: 00340602

July 10, 1996

Grand Junction Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501–2668

Attn: Mr. Michael T. Drollinger
Senior Planner

Our Standby Letter of Credit Number S007/81695/96 issued in your favor for the account of Safeway Inc.

Gentlemen:

Please find attached our amendment to the above subject Letter of Credit increasing the amount from USD132,473.45 to USD139,061.15 and also changing some of the language of the Letter of Credit itself.

Please acknowledge receipt by signing on the copy of this letter.

Sincerely,

Vincent R. Inocencio
Senior Operations Officer

RECEIVED :
BY:
DATE: 7/12/96

SPR-1996-107

James A. Weber
Donald G. LeBrasse

August 30, 1996

Mr. Michael Drollinger
City of Grand Junction
Community Development Department
250 North 5th Street
Grand Junction, CO 81501

Re: **Safeway Store No. 1533**
29 Road and F Road
Grand Junction, CO
Job No. 9529A

Dear Michael:

Construction work on the Safeway store and the shopping center have progressed well this summer. We are requesting your opinion on two site issues as they relate to the approved Site Development Plan.

A. Safeway Inc., is negotiating the sublease of the retail pad building sites with an independent developer. The developer has requested some relatively minor revisions to the layout of Retail Pad No. 2, as indicated on the enclosed drawing. The driveways, utilities, curb cuts and landscaping surrounding the building would remain as originally approved.

Would these minor changes be addressed in an administrative amendment to the Development Plan?

B. The Contractor's have been experiencing considerable difficulties in the placement of soils and underground utilities due to very wet subsoil conditions. We expect these soils problems to also occur during the construction of the detention pond at the southeast corner of the site.

The soft soils in the detention pond area are expected to make the construction of the masonry screen wall very difficult. The masonry screen wall is to be located on the perimeter of the pond on the east and south property lines. We are concerned the wall will not be stable due to the wetting of the soils when water is stored in the pond.

We would like to consider the use of a lightweight fence system at the detention pond only. The balance of the east and south property lines would be screened with the masonry fence as agreed.

We would appreciate your consideration of these two issues. Representatives of Safeway and myself will be in Grand Junction on September 5, 1996, and would appreciate the opportunity to review these two issues. In the meantime, please let us know your comments.

If you have any questions, please contact this office.

Sincerely,

Gary M. Harrison, NCARB
Project Manager

Enclosure

cc: Cam Potter (Safeway)
Brian Hannig (Safeway)

ch\9529\W1043

CONCEPTS WEST ARCHITECTURE, INC. • ARCHITECTS AND PLANNERS
202 East Cheyenne Mountain Blvd., Suite Q • Colorado Springs, CO 80906
(719) 576-1555 (719) 576-1631 - Fax

Post-it® Fax Note 7671	Date 1/6/97	# of pages ▶ 2
To Monty Stroup	From Brenda	
Co./Dept. LANDesign	Co. Lincoln DeVore	
Phone #	Phone #	
Fax #	Fax #	

Lincoln DeVore, Inc.
Geotechnical Consultants

1441 Motor St.
Grand Junction, CO 81505

TEL: (970) 242-8968
FAX: (970) 242-1561

January 6, 1997

Safeway Inc.
Construction Dept.
6900 S. Yosemite St.
Englewood, CO 80112

Re: Existing and Proposed Pavement Section, West Lane of 29 Road at Bike Path, Grand Junction, CO

At the request of Mr. Monty Stroup of LANDesign, personnel of Lincoln DeVore placed 3 shallow exploration borings along the east edge of the existing bike path, on the west side of 29 Road, adjacent to the Safeway, Cottonwood Center Subdivision. These 3 exploration borings were placed on December 30. Due to the very thick pavement sections encountered, 4 additional borings were placed along the approximate center line of the existing bike path on January 6, 1997. Following are our findings.

The 3, shallow exploration borings placed on December 30, 1996, were located to avoid the existing natural gas pipelines. The exploration boring was placed immediately east of the pipelines, immediately adjacent to the thick asphalt road section. The road section along the east side of the existing bike path was found to consist of approximately 5 inches of asphalt concrete and a variable sub-base section ranging from 7 to 10 inches in thickness and an additional 6 to 14 inches of "pit run".

The 4, shallow exploration borings placed on January 6, 1997, were terminated at a total depth of 14 inches, due to the possible, very near proximity of the natural gas line. The exploration borings were placed very near the center of the existing bike path, approximately 4 feet west of the existing yellow paint stripe marking the boundary between the south bound driving lane and the bike path. The asphalt pavement was found to be significantly thinner in this area, ranging from 1 1/4 to 1 1/2 inches up to approximately 50 feet south of F Road. From 50 feet south of F Road to F Road, the asphalt pavement appears to be in excess of 4 inches. The true aggregate base coarse in the center portion of the bike path was found to be a minimum of 9 inches with a maximum of 11 inches. The aggregate base coarse is underlain with a "pit run". All four exploration borings placed on January 6, 1997, were terminated in the pit run material which, appear to be very tight.

Based upon our exploration borings along this bike path and the structural pavement section recommended for 29 Road by Lincoln DeVore, it is recommended that a three inch asphaltic concrete pavement overlay be placed on the existing bike path. This three inch overlay would undoubtly be somewhat thinner to the east, to match the existing pavement. The edge of the existing main drive lane appears to be at least 1 1/2 to 2 1/2 inch higher than the bike path surface.

The 29 Road pavement section, proposed by Lincoln DeVore, consist of four inches of asphaltic concrete pavement on 12 inches of aggregate base coarse. With the addition of a three inch overlay on this bike path, to the width required by the lane adjustment, this proposed section would be maintained. The existing pit run was found to be quite tight and appears well compacted. The original proposed section for 29 Road included a fabric, at the base of the aggregate base coarse. This fabric was included in the original sections due to the possibility of wet areas in the subgrade and the desirable effect of this fabric as a separator, to maintain the aggregate base coarse thickness for the life of the pavement.

We hope this letter has provided you with the information required. If questions arise or further information is needed, please feel free to contact Lincoln-DeVore at any time.

Respectfully submitted,

LINCOLN-DeVORE, INC.

by: Edward M. Morris PE
Engineer/Western Slope Manager

LD Job # 85113-J

LIFT STATION DESIGN REPORT

FOR

SAFEWAY STORE #1533

October 21, 1996

Prepared for:

SAFEWAY INC.
6900 S. Yosemite
Englewood, CO 80112-1412
(303) 843-7916

Prepared by:
LANDesign LLC
259 Grand Avenue
Grand Junction, Colorado 81501
(970) 245-4099

Prepared by: _____
Monty D. Stroup

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

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

A. INTRODUCTION

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

B. PROJECT LOCATION AND DESCRIPTION

The Safeway Cottonwood Centre contains approximately 10.625 acres and is located in the NW 1/4, NW 1/4, Section 8, T.1S., R.1E., Ute Meridian, Mesa County. More particularly the project is located at the Southeast corner of the intersection of 29 Road and Patterson (F Road).

The project site is platted into 5 individual lots and is planned for a Safeway Store (55,200 SF), Retail Pad "A" (9,000 SF), Retail Pad "B" (9,000 SF), Pad/Building-Fast Food (3,500 SF) and Pad/Building-Bank (4,000 SF), see Site Plan in Appendix "A". The site work and Safeway building construction are currently underway. Other Retail Areas within the project shall be constructed as market demands dictate.

C. SANITARY SEWER ALTERNATIVES AND DESIGN CONSTRAINTS

With the development of the original sanitary sewer plans various gravity flow scenarios were considered using the following design constraints:

-- The elevation of each building pad was set slightly higher than adjacent roadway elevations within 29 Road and F Road to assure positive storm drainage away from each pad site. The lowest pad elevation is the Pad/Building-Fast Food site located at the northeast corner of the project at 4,675.50. This pad elevation was used to determine minimum sanitary sewer main depths.

-- The elevation of the sanitary sewer main serving the Fast Food pad was set 6.91 feet below the pad elevation at 4,668.59. This depth is required to provide adequate ground cover over the service lateral at the building pad.

F ROAD SANITARY SEWER ALTERNATIVE

Because the existing sanitary sewer line within F Road is approximately 2.2 feet higher than the minimum site sewer elevation of 4,668.59 it was eliminated immediately as an alternative.

29 ROAD SANITARY SEWER ALTERNATIVE

The existing 8-inch sanitary sewer line within 29 Road is located almost directly under the west edge of asphalt and was constructed circa 1979 at an average depth of approximately 7.6 feet. The 29 Road interceptor sewer is currently owned and maintained by the Central Grand Valley Sanitation District. The invert elevation of the existing sewer main in 29 Road at the point at which Safeway's new lines would connect is approximately 4,668.49 or equal to the minimum site sewer elevation of 4,668.59. With this in mind a direct connection with gravity flow sewer to 29 Road was eliminated as an

alternative.

Further research indicated the existence of a "Drop Manhole", Central Grand Valley Sanitation District #OR104, located approximately 390 feet south of the southwest corner of the project site. The original design proposed the construction of onsite sewer at minimum grades to 29 Road and the removal and reconstruction of the 29 Road interceptor sewer along it's existing alignment south to drop manhole #OR104. This original design puts the new sanitary sewer within 29 Road at an average depth of 13 feet.

D. 29 ROAD SANITARY INTERCEPTOR SEWER CONSTRAINTS

With the construction of the onsite sanitary sewer improvements adverse soils conditions became apparent which make it imperative to re-evaluate the logistics and feasibility of the construction of a 13 feet deep sewer line within 29 Road. Adverse soils conditions were identified with the original "Subsurface Soils Exploration" prepared by Lincoln DeVore however their severity, affect on construction techniques and potential impact to adjacent areas was not fully apparent until encountered with actual construct. Over the course of August and September, 1996 various alternatives to the original design for horizontal alignment and construction techniques of the proposed 29 Road Interceptor were evaluated and reviewed by LANDesign, Lincoln DeVore, Central Grand Valley Sanitation District, Westwater Engineering, Safeway Inc., Francis Constructors, US West and Public Service Company. Lincoln DeVore has completed additional soils investigations along 29 Road to determine potential impacts to 29 Road, adjacent properties, existing utilities and to propose refined construction techniques which could produce an acceptable finish product. The results of the soils investigation along 29 Road and Lincoln DeVore's recommendations are included as Appendix "D" of this report.

The following options for reconstruction of the 29 Road Interceptor were analyzed for safety, logistics, cost, mitigation of the impact to existing utilities and surrounding properties and impact to 29 Road traffic:

OPTIONS

1. Original Design Plan Location, No Sheet Piling.

2. Original Design Plan Location, Use Sheet Piling.

3. Relocate Alignment to Far West Side of Right-Of-Way, No Shoring.

4. Relocate Alignment to Middle of 29 Road, Use Sheet Piling.

With analysis of the above options and without exception the following deterrents to re-construction of the 29 Road Interceptor became apparent.

DETERRENTS

1. Based on the "Subsurface Soils Exploration, Safeway #1533", dated September 18, 1996, prepared by Lincoln DeVore, adverse soils conditions termed "quicksand" will be encountered for the full length of the interceptor construction for unsupported or partially supported excavations more than 1 to 2 feet. Refer to Appendix "D", page 7.

2. Based on the "Subsurface Soils Exploration, Safeway #1533", dated September 18, 1996, prepared by Lincoln DeVore, pipeline or manholes type structures will tend to settle during and after construction. The potential for settlement of the new sewer line could result in non compliance with Central Grand Valley Sanitation District specifications for minimum pipeline grade and pipe alignment after construction is complete. Refer to Appendix "D", page 9.

3. Based on the "Subsurface Soils Exploration, Safeway #1533", dated September 18, 1996, prepared by Lincoln DeVore, soil flowage from below the trench excavation is of great concern. In the event that soil flowage occurs ground loss will occur outside of the excavation which would cause settlement of existing asphalt, utilities, power poles and the potential for damage to adjacent properties. This settlement may continue for an extended period of time after construction. Refer to Appendix "D", page 9 and 10.

4. Based on the "Subsurface Soils Exploration, Safeway #1533", dated September 18, 1996, prepared by Lincoln DeVore, the re-construction of the interceptor sewer without shoring, regardless of the horizontal location, would require a trench top width of 46 to 57 feet. This alternate could adversely affect all existing utilities within 29 Road and could very possible require the complete re-construction of the 29 Road roadway section for the full length of the construction. 29 Road would need to be completely closed to thru traffic from F Road to Orchard Avenue for the duration of the construction. Refer to Appendix "D", page 11.

5. Based on the "Subsurface Soils Exploration, Safeway #1533", dated September 18, 1996, prepared by Lincoln DeVore, shoring of the trench excavation would require the installation of "sheet piling" to a depth of 15 feet below the trench bottom. This would require the installation of sheets driven to a depth of 31 feet on both sides of the trench. Due to the size of equipment required to drive sheets to this depth, 29 Road would need to be completely closed to thru traffic from F Road to Orchard Avenue for the duration of the construction. Refer to Appendix "D", page 11 and 12.

6. After installation and backfill of the sewer line each sheet pile would be extracted by vibratory process. It is not unlikely that the extraction procedure could cause movement in the trench between the pipe zone backfill material and the native trench walls. If movement of the trench occurs deflection in the pipe alignment resulting in non compliance with Central Grand Valley Sanitation District specifications for minimum pipeline grade and pipe alignment after construction is complete.

7. Each of the options for re-construction of the interceptor sewer line in 29 Road were analyzed for costs. The costs for the options as listed range from $335.00 to $710.00 per lineal foot assuming acceptance of the final product without major construction delays or problems.

FUTURE REHABILITATION OF THE 29 ROAD INTERCEPTOR SEWER

Central Grand Sanitation District's engineer, Westwater Engineering, has indicated that future plans for rehabilitation if the 29 Road interceptor may include the application of "pipe bursting". If this procedure is used the sewer line could be retro fitted with new pipe without excavation of the old pipe line.

E. LIFT STATION ALTERNATIVE

The Lift Station Alternative is proposed based on the limitations of sewer oufall alternatives, logistics, safety concerns, impacts to utilities and surrounding areas, the interruption of thru traffic flow on 29 Road, costs and scheduling. In addition, it is possible that after construction the final product may not comply with Central Grand Valley Sanitation District specifications for minimum pipeline grade and pipe alignment as a result of one or more of the aforementioned deterrents.

F. OPERATION AND MAINTENANCE

The proposed Lift Station is to be constructed at the southwest corner of the Safeway project adjacent to a secondary access way off of 29 Road. The construction of the Lift Station shall be at the sole cost of Safeway Inc. The instrument giving Safeway authority over the project property and the right to construct the Lift Station is a "Memorandum of Ground Lease" and is presented herein as Appendix "E". The operation and long term maintenance of the Lift Station shall be by the City of Grand Junction by "Lift Station Agreement" and is presented herein as Appendix "F".

G. SEWAGE SERVICE AND GENERATION

The sewer system service involves the Safeway store and 4 additional areas on the project site which will accommodate Retail Sales, a Fast Food Restaurant and a Bank. The type of use within each area was maximized to represent a worse case scenario at the time of ultimate buildout of the project site. Using the calculations as presented in Appendix "A", pages 1 thru 5 the initial average daily flow for the Safeway store shall be 5,552 gallons per day with a future average daily flow of 19,797 gallons per day at ultimate buildout. The peak daily flow estimates for the system are calculated by using a peaking factor of 4.0. The resulting initial peak daily flow will be 22,208 gallons per day with a future peak daily flow of 79,188 gallons per day at ultimate buildout.

The Lift Station will serve only the project site. Offsite areas adjacent to the Safeway project are currently served by other elements owned and maintained by the Central Grand Valley Sanitation District. The potential for the Safeway Lift Station to serve other offsite areas is remote.

H. SEWAGE PUMPING AND LIFT STATIONS

1. Design Flow Range

The minimum daily flow is defined as one-third of the average daily flow and is determined to be 1,841 gallons per day for Safeway store and 6,589 gallons per day for future conditions at ultimate buildout. This flow is the minimum flow that the lift station will be required to handle.

2. Pump and WetWell Design

After consulting with James H. Martinsen of Falcon Supply, he determined that a non-clog pump station manufactured by Smith and Loveless, from Lenexa, Kansas, model number 4B2B, would meet the criteria to serve the project site. Please refer to the information included herein as Appendix "C" regarding pump design and specifications. This pump has a capacity of delivering 100 gpm with a maximum static suction lift of 16 feet 0 inches, and wetwell bottom dimension of six feet inside diameter.

The lift station is designed to have two pumps, each pump having the capacity of at least 100% of the peak hourly flow calculated at 3,299.50 GPH or 55 GPM. It has been determined that a third standby pump is not needed.

The emergency volume for the lift station was found to be 824.88 gallons, which was determined using a City of Grand Junction emergency response time of between 45 minutes and 1 hour. As directed by the Colorado Department of Health the Average Daily Flow rates were used in the calculation of emergency storage volumes, the calculations for which are presented in Appendix "A", page 5 of this report. The lag volume at the bottom of the well was calculated as 142.13 gallons. The pump shall be connected to a phone line sent to the City of Grand Junction maintenance department for 24-hour monitoring.

Using a volume created by the minimum daily flow for a cycle of 30 minutes and the inside dimensions of the pump, the operational volume for the pump was found to be 38.3 gallons initially and 137.2 gallons for future conditions. This would give the pump a running time of approximately Twenty-Three seconds to One minute and Twenty-Three seconds, with the two available pumps alternating each cycle. Aeration or other methods of preventing stagnation are not included in the design.

The size of the well is as follows; Depth is 16 feet 1 inch, the bottom inside diameter of the well will be six-feet., emergency volume is 824.88 gallons and operating volume is calculated as 38.3 to 137.2 gallons. The pump has a capacity of delivering 100 gallons per minute and has a 1-1/2 horsepower motor for each pump. The maximum speed of the motor is given as 875 RPM and the maximum static suction lift will be 16 feet.

The ground water table at the the Lift Station has been established at approximately 8.5 feet below the ground surface. The effects of buoyancy on the well were calculated and are presented as Appendix "A", page 14. A anchoring system consisting of driven piles connected to the base of the wetwell is incorporated into the design and is presented on the Lift Station design drawing contained in the map pocket of this report.

3. Discharge Line

The discharge line shall be a 4-inch diameter. The length of pipe to consider head loss is 100-feet. The (static head) elevation difference from the end of the lift station suction line to the manhole receiving the flow is 9.19-feet. The head loss in the pipe due to friction is estimated as 0.6642 feet and the velocity head loss is estimated at 0.50-feet. This gives the total dynamic head (TDH) of approximately 10.35-feet. See the calculations presented as Appendix "A", sheets 15, 16 and 17.

4. Pump Selection

As a minimum for the lift station, there will be two pumps included in the design of the system and for each 30 minute cycle the pumps will alternate every other cycle. The net positive suction head required is 15 feet 7 inches. There are head-capacity curves located in Appendix "C" as provided by Mr. Martinsen of Falcon Supply.

Each motor will have a rating of least 1-1/2 horsepower, a minimum efficiency rating of 50 percent and a maximum static suction lift of 16 feet. Impeller model number S4L22,

which is described on the head-capacity curve located Appendix "C", was be used in the design. The control equipment will be mounted in a NEMA Type 1 steel enclosure. The motor driving the pumps will be a three-stage motor and will be supplied with a power source that coincides with that motor type. More information regarding to the specific controls and power supplies can be found in Appendix "C" of this report.

APPENDIX "A"

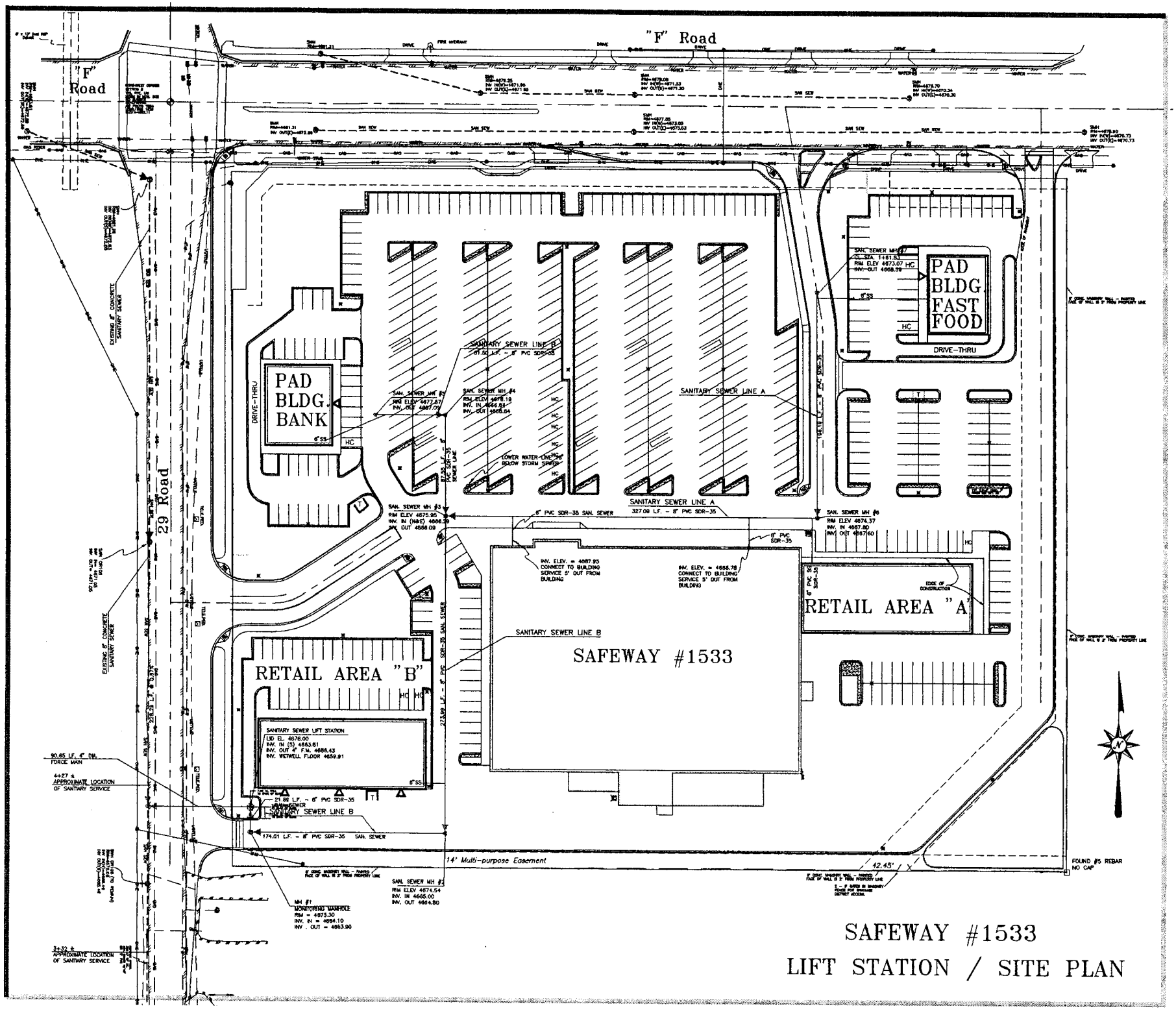
LIFT STATION / SITE PLAN

AREA ZONING MAPS

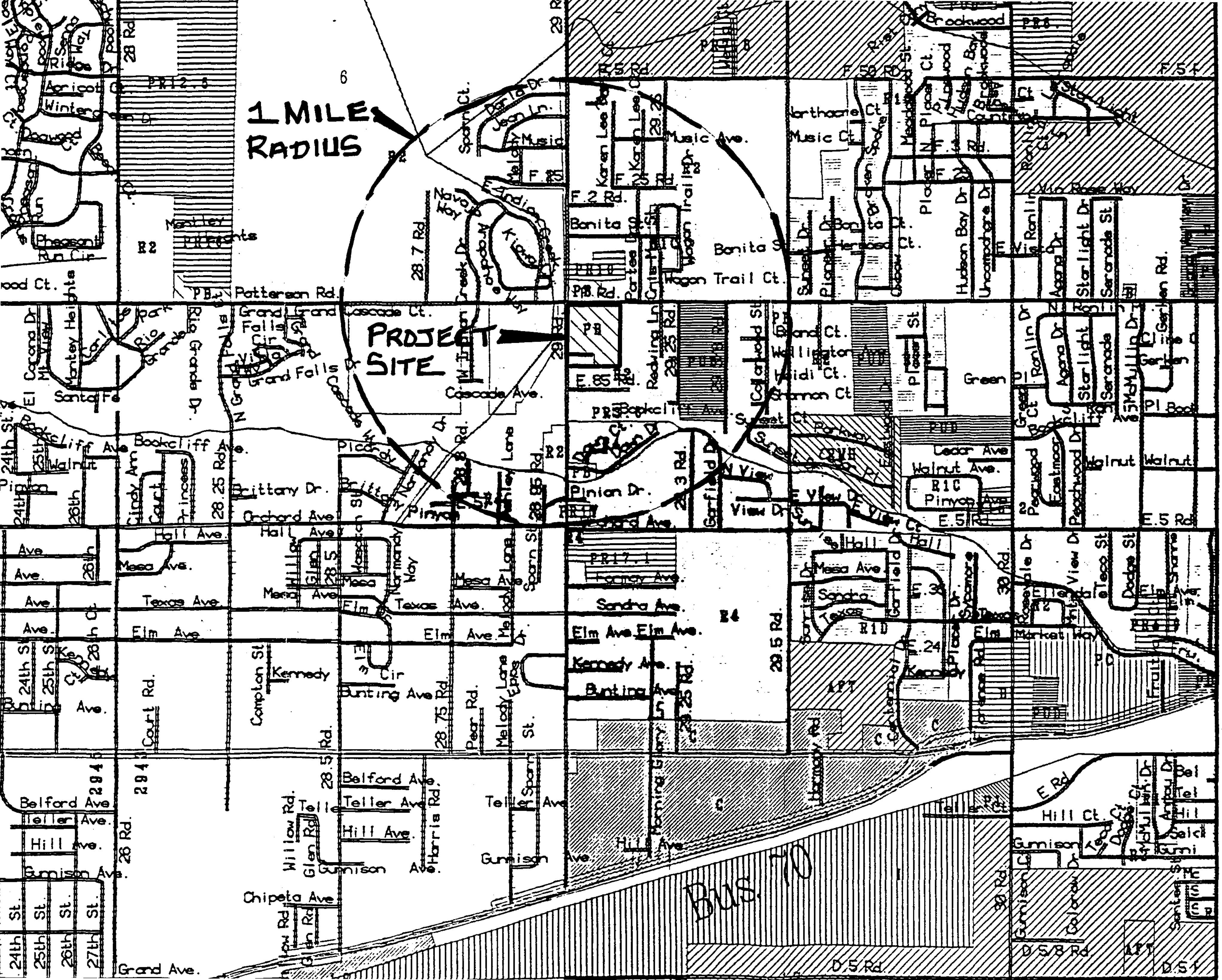
SANITATION DISTRICTS BOUNDARY MAP

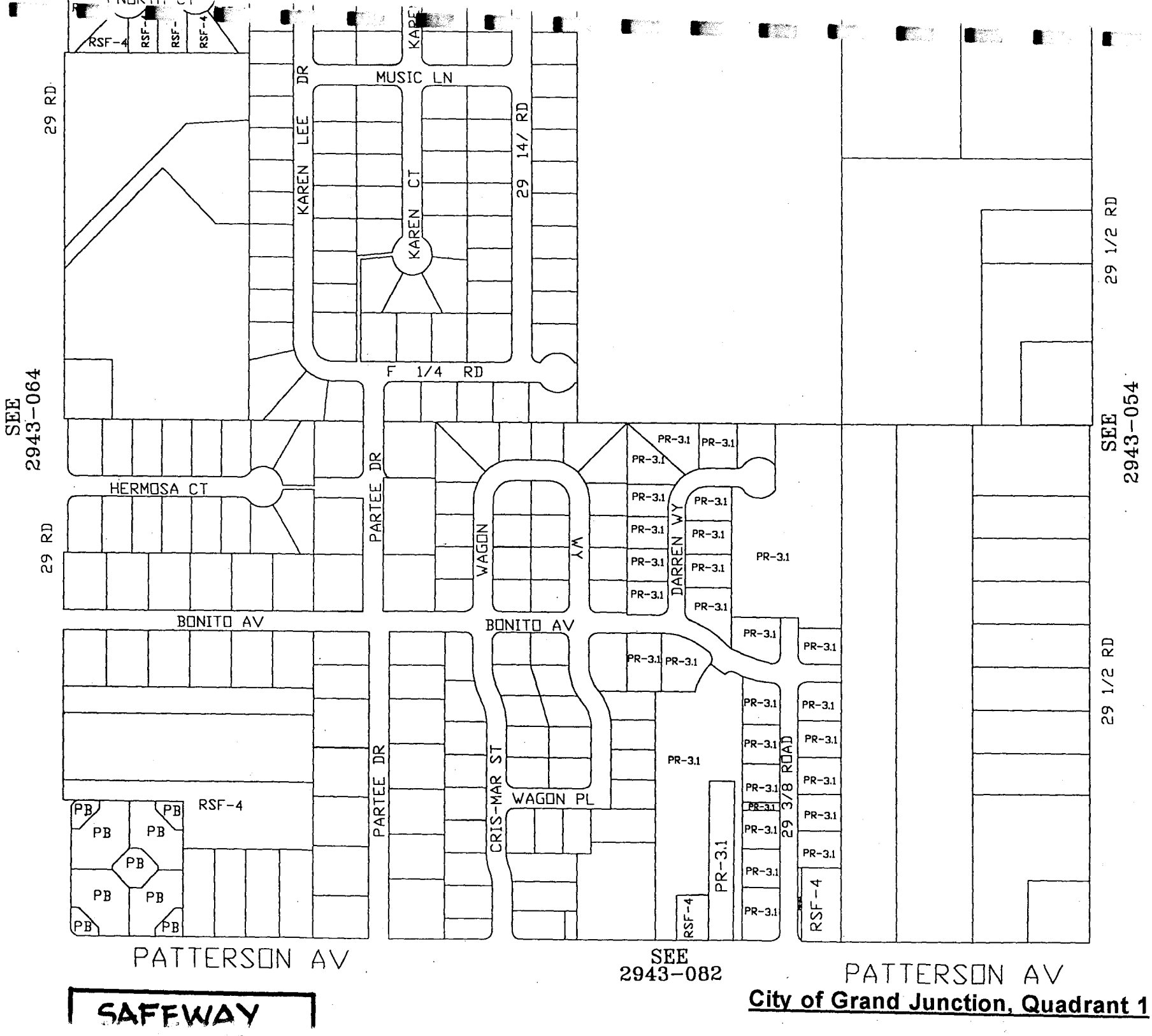
SANITATION & WATER DISTRICTS LIST

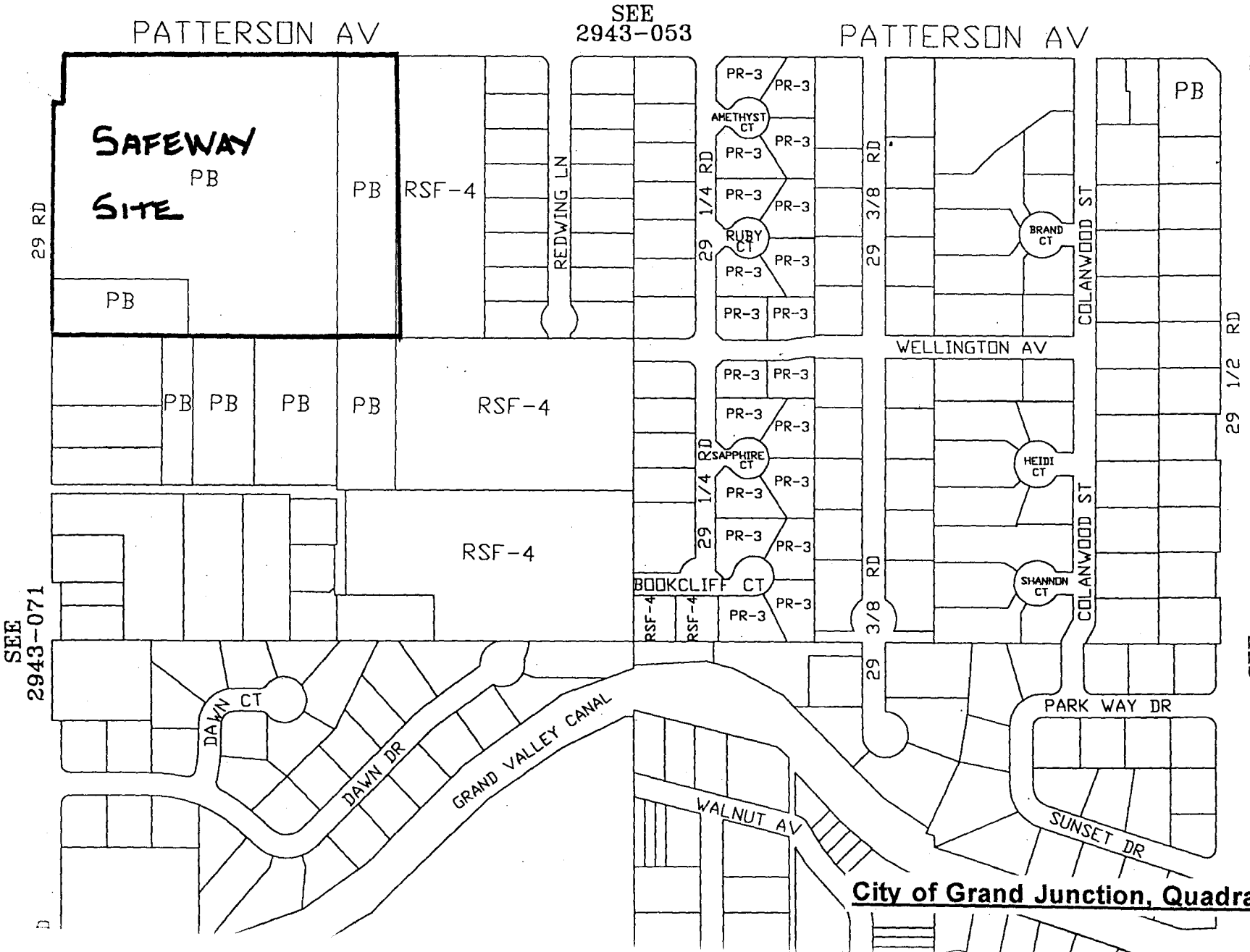
FEME FLOODPLAIN MAP



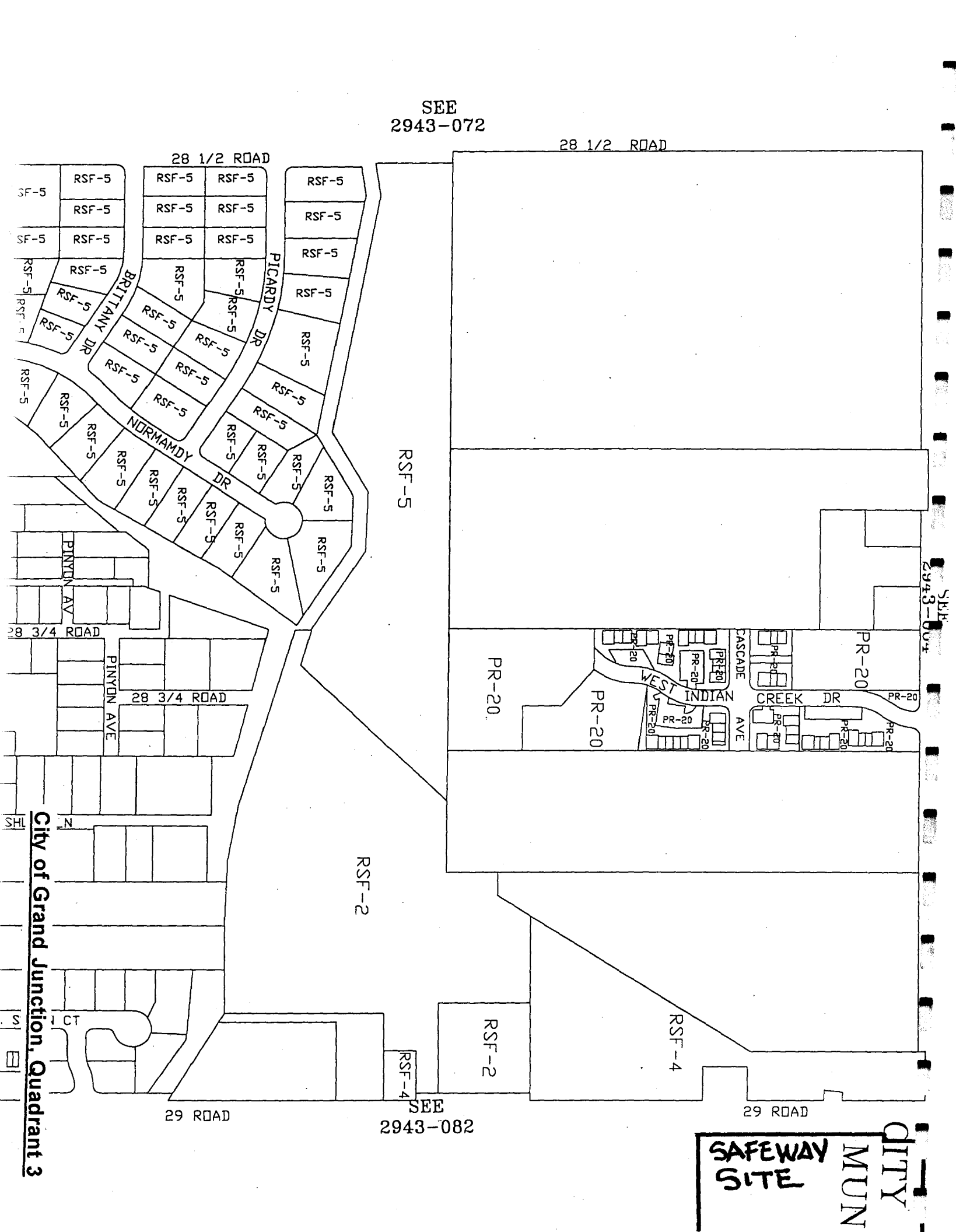
SAFEWAY #1533
LIFT STATION / SITE PLAN


1 MILE RADIUS
PROJECT SITE
Bus. 70
Patterson Rd.
Bookcliff Ave.
Orchard Ave.
Texas Ave.
Elm Ave.
Grand Ave.
28 Rd.
28.5 Rd.
29 Rd.
29.5 Rd.
30 Rd.
28.25 Rd.
28.75 Rd.
Cascade Ave.
Pinion Dr.
Mesa Ave.
Hall Ave.
Belford Ave.
Teller Ave.
Hill Ave.
Gunnison Ave.
Chipeta Ave.
D.5 Rd.
E.5 Rd.
F.5 Rd.
F.2 Rd.
Music Ave.
Bonita St.
Wagon Trail Ct.
Kennedy Ave.
Bunting Ave.
Sandra Ave.
Rio Grande Dr.
Court Rd.
Compton St.
Melody Lane
Sparn St.
Green Pl.

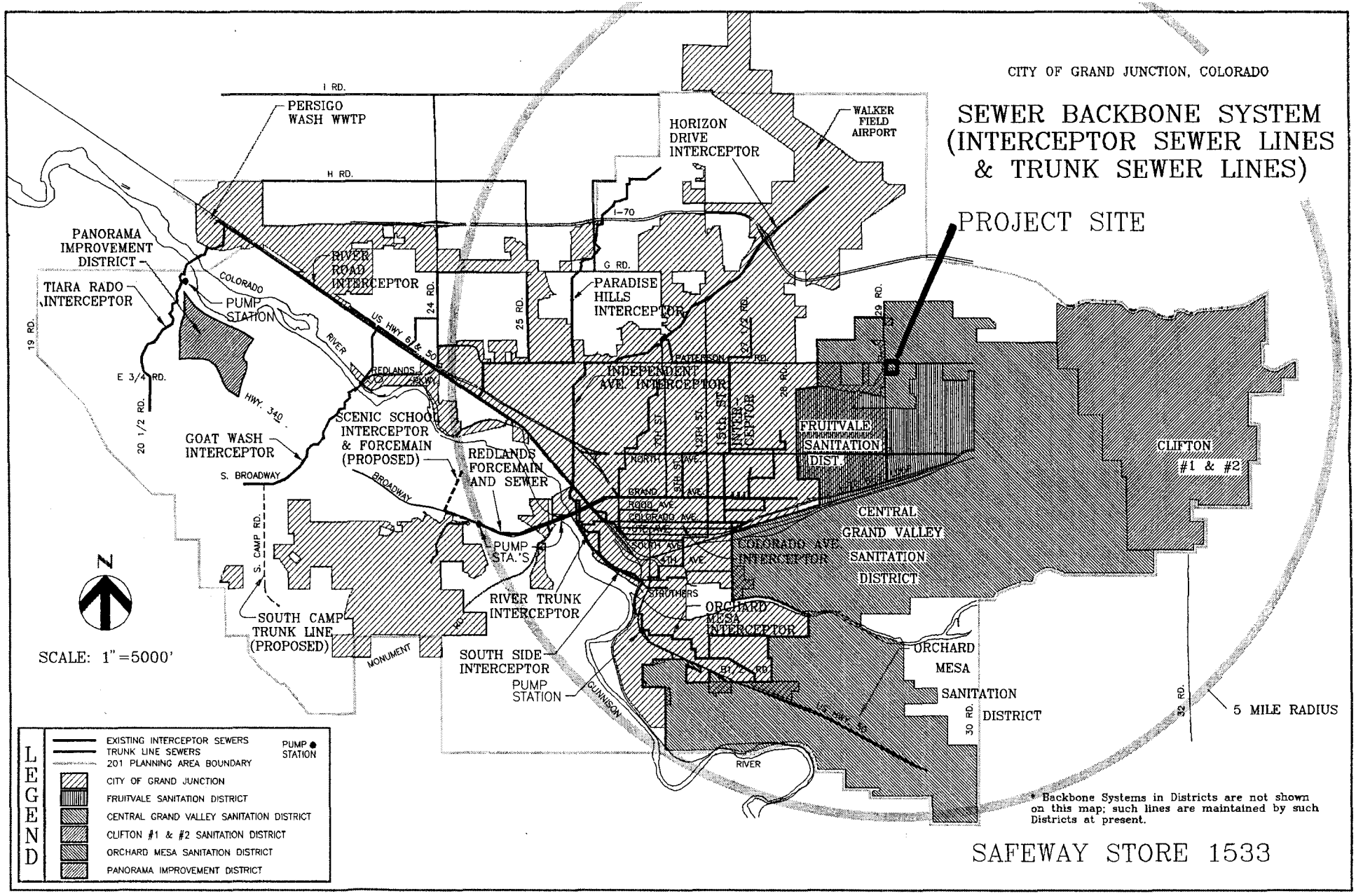

SEE 2943-064
SEE 2943-054
SEE 2943-082
29 RD
29 1/2 RD
KAREN LEE DR
KAREN CT
MUSIC LN
29 1/4 RD
F 1/4 RD
HERMOSA CT
PARTEE DR
WAGON WY
DARREN WY
BONITO AV
CRIS-MAR ST
WAGON PL
29 3/8 ROAD
PATTERSON AV
RSF-4
PR-3.1
PB
SAFFWAY
City of Grand Junction, Quadrant 1



City of Grand Junction, Quadrant 2


SEE
2943-072
28 1/2 ROAD
28 1/2 ROAD
RSF-5
RSF-2
RSF-4
PR-20
BRITTANY DR
PICARDY DR
NORMAMDY DR
PINYON AV
PINYON AVE
28 3/4 ROAD
28 3/4 ROAD
WEST INDIAN CREEK DR
CASCADE AVE
29 ROAD
29 ROAD
SEE
2943-082
SEE
2943-004
SAFEWAY
SITE
CITY
MUN
City of Grand Junction, Quadrant 3


City of Grand Junction, Quadrant 4
SAFEWAY SITE
SEE
2943-053
29 RD
PR-8.4
PZ
MUSIC LN
MELODY LN
SPARN CT
JEAN LN
DARLA DR
F 1/4 RD
EAST INDIAN CREEK DR
INDIAN CREEK CR
KOIWA CT
ARAPAHOE WY
WEST INDIAN CREEK DR
NAVAJO WY
PATTERSON AV
SEE
2943-071
28 3/4 RD
SEE
2943-063
RSF-5
PR-8.4


CITY OF GRAND JUNCTION, COLORADO
SEWER BACKBONE SYSTEM
(INTERCEPTOR SEWER LINES
& TRUNK SEWER LINES)
PROJECT SITE
PERSIGO WASH WWTP
HORIZON DRIVE INTERCEPTOR
WALKER FIELD AIRPORT
PANORAMA IMPROVEMENT DISTRICT
TIARA RADO INTERCEPTOR
PUMP STATION
RIVER ROAD INTERCEPTOR
PARADISE HILLS INTERCEPTOR
INDEPENDENT AVE. INTERCEPTOR
GOAT WASH INTERCEPTOR
SCENIC SCHOOL INTERCEPTOR & FORCEMAIN (PROPOSED)
REDLANDS FORCEMAIN AND SEWER
FRUITVALE SANITATION DIST.
CLIFTON #1 & #2
CENTRAL GRAND VALLEY SANITATION DISTRICT
COLORADO AVE. INTERCEPTOR
PUMP STA.'S
RIVER TRUNK INTERCEPTOR
SOUTH CAMP TRUNK LINE (PROPOSED)
ORCHARD MESA INTERCEPTOR
SOUTH SIDE INTERCEPTOR
PUMP STATION
ORCHARD MESA SANITATION DISTRICT
5 MILE RADIUS
SCALE: 1"=5000'
LEGEND
EXISTING INTERCEPTOR SEWERS
TRUNK LINE SEWERS
201 PLANNING AREA BOUNDARY
PUMP STATION
CITY OF GRAND JUNCTION
FRUITVALE SANITATION DISTRICT
CENTRAL GRAND VALLEY SANITATION DISTRICT
CLIFTON #1 & #2 SANITATION DISTRICT
ORCHARD MESA SANITATION DISTRICT
PANORAMA IMPROVEMENT DISTRICT
* Backbone Systems in Districts are not shown on this map; such lines are maintained by such Districts at present.
SAFEWAY STORE 1533

SAFEWAY STORE 1533
2901 F Road
Grand Junction, Colorado

LIST OF SANITARY SEWER AND WATER DISTRICTS
WITHIN 5 MILE RADIUS OF SITE

Sewer Districts

City of Grand Junction
Utilities Department
250 North 5th
Grand Junction, Colorado 81501

(970) 244-1487

Central Grand Valley Sanitation District
541 Hoover Drive
Grand Junction, Colorado 81504

(970) 434-2276

Clifton Sanitation District No. 2
3222 US Hwy. 6 & 50
Clifton, Colorado 81520

(970) 434-7422

Fruitvale Sanitation District
2887 North Avenue
Grand Junction, Colorado 81501

(970) 243-1494

Clifton Sanitation District No. 1
137 3rd Street
Clifton, Colorado 81520

(970) 434-7328

Orchard Mesa Sanitation District
240 27-1/4 Road
Grand Junction, Colorado 81503

(970) 245-0033

Water Districts

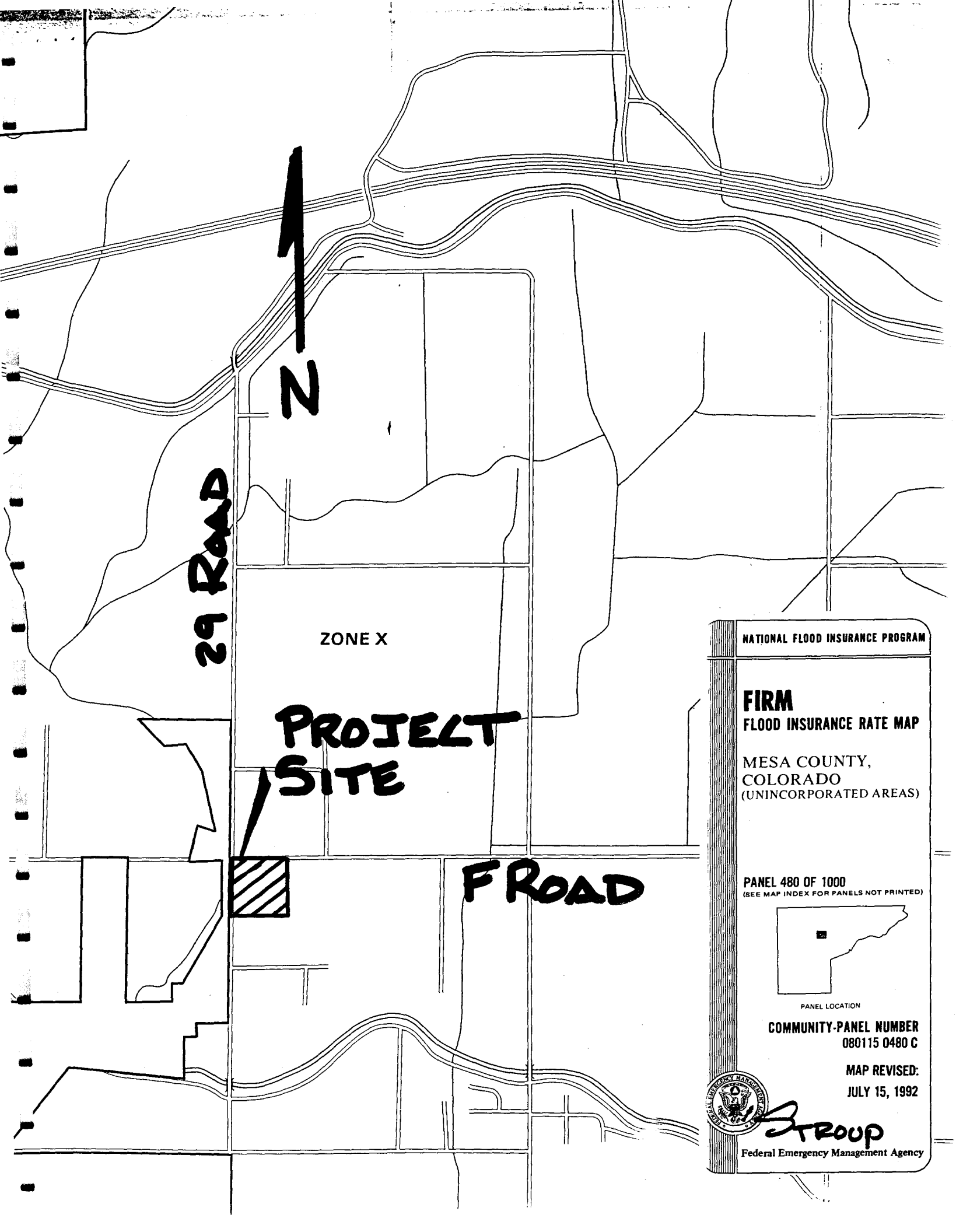
City of Grand Junction
Utilities Department
250 North 5th
Grand Junction, Colorado 81501

(970) 244-1487

Ute Water Conservancy District
560 25 Road
Grand Junction, Colorado 81505

Clifton Water District
137 3rd Street
Clifton, Colorado 81520

(970) 434-7328



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MESA COUNTY,
COLORADO
(UNINCORPORATED AREAS)

PANEL 480 OF 1000
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
080115 0480 C

MAP REVISED:
JULY 15, 1992

GROUP

Federal Emergency Management Agency

APPENDIX "B"

SITE FLOW CALCULATIONS

Date: 24-Sep-96

Project: **SAFEWAY COTTONWOOD CENTRE #1533**
Subject: **SANITARY SEWER LIFT STATION DESIGN**
Page: 1

(1) ESTIMATE OF SEWAGE FLOWS

SAFEWAY STORE: 55,220 SF. GROCERY STORE.

---- Average Daily Flow:

55,220 SF. x 0.10 GPD / SF. of Retail Space = 5,522 GPD

---- Minimum Daily Flow:

1/3 (5,522 GPD Average Daily Flow) = 1,841 GPD

---- Peak Daily Flow = 4.0 x (Average Daily Flow)

4.0 (5,522 GPD) = 22,088 GPD

---- 30 Minute Cycle Volume

Volume= (1,841 GPD) / (24 HRS / DAY) = 76.7 GAL/ HR

30 Minute Cycle : 76.7 GAL/ HR / 2 = 38.3 GAL / 30 Minutes

= 5.13 CF / 30 Minutes

---- BOD Strength in LBS / DAY

(55,220 SF x 0.01 LBS / DAY) = 552.2 LBS / DAY

Date: 24-Sep-96

Project: **SAFEWAY COTTONWOOD CENTRE #1533**
Subject: **SANITARY SEWER LIFT STATION DESIGN**
Page: 2

(1) ESTIMATE OF SEWAGE FLOWS

Retail Areas A & B:

Retail Areas A & B = (Assume 1,200 S.F. / tenant space)

Total Area	18,000	=	15	tenant spaces
1,200 S.F.	1,200			

---- Assume 13 of these spaces are normal retail merchants @ 15,600 SF.

---- The remaining 2 spaces are assumed to be higher water consuming facilities such as a coin laundry & 1 fast food tenant. Laundry has 20 machines and fast food tenant has 20 seats with paper service only, serving 60 meals/ day.

---- Average Daily Flow:

13 Retail Spaces: 15,600 SF. x 0.10 GPD / SF. =	1,560 GPD
Laundry : 20 machines x 400 GPD/ machine =	8,000 GPD
Fast Food : 20 seats x 25 GPD / seat=	500 GPD
5 employees x 15 GPD =	75 GPD
Total =	10,135 GPD

---- Minimum Daily Flow:

1/3 (10,135 GPD Average Daily Flow) = 3,378 GPD

---- Peak Daily Flow = 4.0 x (Average Daily Flow)

4.0 (10,135 GPD) = 40,540 GPD

---- 30 Minute Cycle Volume

Volume= (3,378 GPD) / (24 HRS / DAY) = 140.8 GAL/ HR

30 Minute Cycle : 140.8 GAL/ HR / 2 = 70.4 GAL / 30 Minutes

= 9.41 CF / 30 Minutes

---- BOD Strength in LBS / Day

Retail Space: (15,600 SF x 0.01 LBS / DAY/ SF)	156.0 LBS / DAY
Laundry : 20 machines x 0.75 LBS/ machine =	15.0 LBS / DAY
Fast Food : 60 meals / day x 0.01 LBS/ meal =	0.6 LBS / DAY
5 employees x 0.06 LBS /DAY =	0.3 LBS / DAY
Total =	171.9 LBS / DAY

Date: 03-Oct-96

Project: **SAFEWAY COTTONWOOD CENTRE #1533**
Subject: **SANITARY SEWER LIFT STATION DESIGN**

(1) ESTIMATE OF SEWAGE FLOWS

PAD BUILDING - FAST FOOD: 3,500 SF.

---- Assume larger facility such as Taco Bell, MacDonals, Burger King, Ect. with 12 employees, serving 1,200 meals per day. (Paper service only).

---- Average Daily Flow:

Fast Food : 50 seats x 75 GPD / seat=	3,750 GPD
12 employees x 15 GPD =	180 GPD
	3,930 GPD

---- Minimum Daily Flow:

1/3 (3,930 GPD Average Daily Flow) =	1,310 GPD

---- Peak Daily Flow = 4.0 x (Average Daily Flow)

4.0 (3,930 GPD) =	15,720 GPD

---- 30 Minute Cycle Volume

Volume= (1,310 GPD) / (24 HRS / DAY) =	54.6 GAL/ HR
30 Minute Cycle : 54.6 GAL/ HR / 2 =	27.3 GAL / 30 Minutes
=	3.65 CF / 30 Minutes

---- BOD Strength in LBS / DAY

Fast Food : 1,200 meals / day x 0.01 LBS/ meal	12.0 LBS / DAY
12 employees x 0.06 LBS /DAY =	0.7 LBS / DAY
Total =	12.7 LBS / DAY

Date: 24-Sep-96

Project: **SAFEWAY COTTONWOOD CENTRE #1533**
Subject: **SANITARY SEWER LIFT STATION DESIGN**
Page: 4

(1) ESTIMATE OF SEWAGE FLOWS

PAD BUILDING - BANK: 4,000 SF. +-

---- Assume 12 employees working 1- 8 hour shift.

---- Average Daily Flow:

12 employees x 15 GPD = 180 GPD

---- Minimum Daily Flow:

1/3 (180 GPD Average Daily Flow) = 60 GPD

---- Peak Daily Flow = 4.0 x (Average Daily Flow)

4.0 (180 GPD) = 720 GPD

---- 30 Minute Cycle Volume

Volume= (60 GPD) / (24 HRS / DAY) = 2.5 GAL/ HR

30 Minute Cycle : 2.5 GAL/ HR / 2 = 1.2 GAL / 30 Minutes

= 0.17 CF / 30 Minutes

---- BOD Strength in LBS / DAY

12 employees x 0.06 LBS /DAY = 0.7 LBS / DAY

Date: 03-Oct-96

Project: SAFEWAY COTTONWOOD CENTRE #1533
Subject: SANITARY SEWER LIFT STATION DESIGN

(2) SUMMARY OF SEWAGE FLOWS

Facility	Average Daily Flow	Minimum Daily Flow	Peak Daily Flow	30 Minute Cycle Volume		BOD LBS/ D
Safeway	5,552 GPD	1,841 GPD	22,208 GPD	38.3 GAL/30min	5.13 CF/30min	552.2
Retails A & B	10,135 GPD	3,378 GPD	40,540 GPD	70.4 GAL/30min	9.41 CF/30min	171.9
Building Pad Fast Food:	3,930 GPD	1,310 GPD	15,720 GPD	27.3 GAL/30min	3.65 CF/30min	12.7
Building Pad Bank:	180 GPD	60 GPD	720 GPD	1.2 GAL/30min	0.17 CF/30min	0.7
TOTALS:	19,797 GPD	6,589 GPD	79,188 GPD	137.2 GAL/30min	18.36 CF/30min	737.5

(3) EMERGENCY 1-HOUR STORAGE REQUIRED VOLUME

---- City of Grand Junction emergency response time is estimated at 45 minutes to 1 hour per City Utility Engineer.

---- Use Average Daily Flows to calculate minimum storage volume per C.D.O.H. direction.

Emergency Storage Volume = (19,797 GPD/ 24 HR/ DAY)= 824.88 GAL/HR
= 110.27 CF.

(4) OPERATING VOLUME

137.2 GAL / 30 minunute cycle
18.36 CF. / 30 minunute cycle

(4) PUMP OPERATING VOLUME RANGE

Minimum= 137.2 GAL / 30 Minutes = 4.57 GPM

Maximum = 79,188 GPD/ 24 HRs. / 60 Min./ Hr.= 54.99 GPM

Date: 25-Sep-96

Project: **SAFEWAY COTTONWOOD CENTRE #1533**
Subject: **SANITARY SEWER LIFT STATION DESIGN**
Page: 6

(5) WETWELL VOLUME CALCULATIONS

---- Given: 6'-0" I.D. Concrete wetwell.
Top of wetwell elevation= 4676.00
Invert elevation of well floor = 4659.91
Invert elevation in (8" Gravity sewer) = 4663.91
Invert elevation into gravity sewer in 29 Road = 4669.60
60 Degree grouted inverts.
Elevation at top of grouted inverts = 4663.81

---- Volume calculation completed using the conical method taking into consideration the sloped invert.

~ STAGE / STORAGE TABLE é

1. RESERVOIR No = 1. 2. RESERVOIR NAME = LIFT WETWELL
3. S = Ks * Z^b
Ks = 0..... b = 0.....
START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	59.91.	7.5.....	0	0
5	0.50	60.41.	12.21...	4	4
6	1.00	60.91.	15.39...	6	10
7	2.00	61.91.	21.21...	18	28
8	3.00	62.91.	25.9....	23	51
9	3.90	63.81.	28.27...	24	75
10	4.00	63.91.	28.27...	2	77
11	5.00	64.91.	28.27...	28	105
12	6.00	65.91.	28.27...	28	133
13	7.00	66.91.	28.27...	28	161
14	0.00	0.00.	0.....	0	0

R to reset

Change item number: 0 to cont

PAGE: 7

Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETW

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
0.00	59.91	0	0	0.00
0.05	59.96	0	0	0.00
0.10	60.01	0	1	0.00
0.15	60.06	0	1	0.00
0.20	60.11	0	2	0.00
0.25	60.16	0	2	0.00
0.30	60.21	0	2	0.00
0.35	60.26	0	3	0.00
0.40	60.31	0	3	0.00
0.45	60.36	0	4	0.00
0.50	60.41	0	4	0.00

[] to cont [PgUp] [PgDn] [Esc] to exit

Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETW

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
0.50	60.41	0	4	0.00
0.55	60.46	1	5	0.00
0.60	60.51	1	5	0.00
0.65	60.56	1	6	0.00
0.70	60.61	1	6	0.00
0.75	60.66	1	7	0.00
0.80	60.71	1	8	0.00
0.85	60.76	1	8	0.00
0.90	60.81	1	9	0.00
0.95	60.86	1	9	0.00
1.00	60.91	1	10	0.00

[] to cont [PgUp] [PgDn] [Esc] to exit

LAG VOLUME.

Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETWE

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
1.00	60.91	1	10	0.00
1.10	61.01	2	12	0.00
1.20	61.11	2	14	0.00
1.30	61.21	2	15	0.00
1.40	61.31	2	17	0.00
1.50	61.41	2	19	0.00
1.60	61.51	2	21	0.00
1.70	61.61	2	23	0.00
1.80	61.71	2	24	0.00
1.90	61.81	2	26	0.00
2.00	61.91	2	28	0.00

142.136 GAL

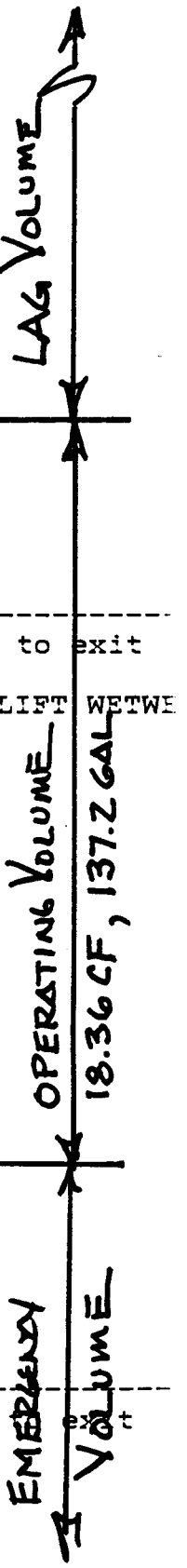
[] to cont [PgUp] [PgDn] [Esc] to exit

Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETWE

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
2.00	61.91	2	28	0.00
2.10	62.01	2	30	0.00
2.20	62.11	2	33	0.00
2.30	62.21	2	35	0.00
2.40 2.42	62.31 62.33	2	37 37.36 CF.	0.00 279.336 GAL
2.50	62.41	2	39	0.00
2.60	62.51	2	42	0.00
2.70	62.61	2	44	0.00
2.80	62.71	2	46	0.00
2.90	62.81	2	49	0.00
3.00	62.91	2	51	0.00

[] to cont [PgUp] [PgDn] [Esc] exit



Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETW

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
3.00	62.91	2	51	0.00
3.09	63.00	2	53	0.00
3.18	63.09	2	56	0.00
3.27	63.18	2	58	0.00
3.36	63.27	2	61	0.00
3.45	63.36	2	63	0.00
3.54	63.45	2	65	0.00
3.63	63.54	2	68	0.00
3.72	63.63	2	70	0.00
3.81	63.72	2	73	0.00
3.90	63.81	2	75	0.00

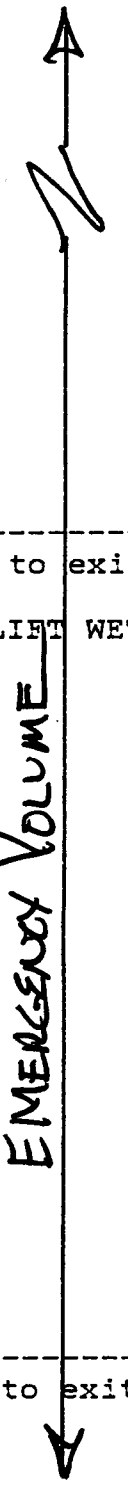
[] to cont [PgUp] [PgDn] [Esc] to exit

Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETW

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
4.00	63.91	0	77	0.00
4.10	64.01	3	80	0.00
4.20	64.11	3	83	0.00
4.30	64.21	3	85	0.00
4.40	64.31	3	88	0.00
4.50	64.41	3	91	0.00
4.60	64.51	3	94	0.00
4.70	64.61	3	97	0.00
4.80	64.71	3	99	0.00
4.90	64.81	3	102	0.00
5.00	64.91	3	105	0.00

[] to cont [PgUp] [PgDn] [Esc] to exit



Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETWE

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
5.00	64.91	3	105	0.00
5.10	65.01	3	108	0.00
5.20	65.11	3	111	0.00
5.30	65.21	3	113	0.00
5.40	65.31	3	116	0.00
5.50	65.41	3	119	0.00
5.60	65.51	3	122	0.00
5.70	65.61	3	125	0.00
5.80	65.71	3	127	0.00
5.90	65.81	3	130	0.00
6.00	65.91	3	133	0.00

110.27CF, 824.88 GAL.

[] to cont [PgUp] [PgDn] [Esc] to exit

Reservoir No. 1 STAGE / STORAGE / DISCHARGE LIFT WETWE

Storage values were input manually
Discharge values: Culvert struct A. Q = .6 * A * [2gh/k]^.5 * 0
Culvert struct B. Q = .6 * A * [2gh/k]^.5 * 0
Weir struct A. Q = 3 * 0 * H ^ 1.5
Weir struct B. Q = 3 * 0 * H ^ 1.5

STAGE	ELEVATION	INC STOR cu ft	TOT STOR cu ft	OUTFLOW cfs
6.00	65.91	3	133	0.00
6.10	66.01	3	136	0.00
6.20	66.11	3	139	0.00
6.30	66.21	3	141	0.00
6.40	66.31	3	144	0.00
6.50 6.52	66.41 66.43	3	147 147.63CF	0.00
6.60	66.51	3	150	0.00
6.70	66.61	3	153	0.00
6.80	66.71	3	155	0.00
6.90	66.81	3	158	0.00
7.00	66.91	3	161	0.00

EMERGENCY VOLUME

[] to cont [PgUp] [PgDn] [Esc] to exit

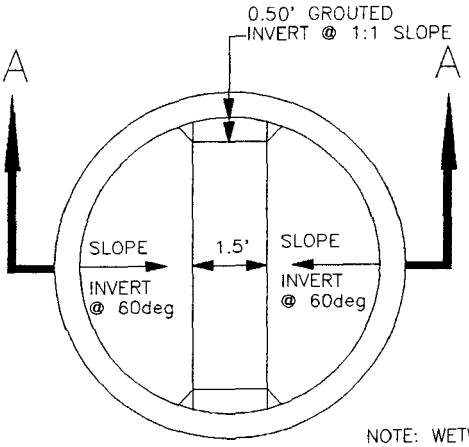
TABLE I

QUANTITIES AND BOD STRENGTH OF SEWAGE
FOR VARIOUS TYPES OF USES

TYPE OF ESTABLISHMENT	GALLONS/PERSON/DAY (AVERAGE) (UNLESS OTHERWISE STATED)	LBS. BOD5/PERSON/DAY (UNLESS OTHERWISE STATED)
Residential		
Single-family dwellings (two people per bedroom)	75	.20
Separate Distribution of Flows - Individual Residential use		
Bath/Shower	14.7	.014
Dishwasher	1.8	.002
Kitchen sink	4.4	.045
Additional for garbage grinder	1.4	.052
Laundry washer	19.5	.037
Lavatory	8.4	.021
Water closet	24.8	.029
Hotels and Motels - per room (without private baths)	50	.15
Hotels and Motels - per room (with private baths)	75	.15
Multiple-family dwellings or apartments	75	.20
Boarding and Rooming houses	50	.15
Mobile Home Parks	75	.20
(per space)	300	.80
Commercial		
Airports (per passenger)	5	.02
(per employee)	10	.06
Barber and Beauty Shops (per chair)	100	.70*
Bowling Alleys (per lane - toilet wastes only)	5	.03*
Bus Service Areas (not including food)	5	.02
Country clubs		
(per member)	30	.02
(per employee)	20	.06
Dentist offices (per non-wet chair)	50	.14*

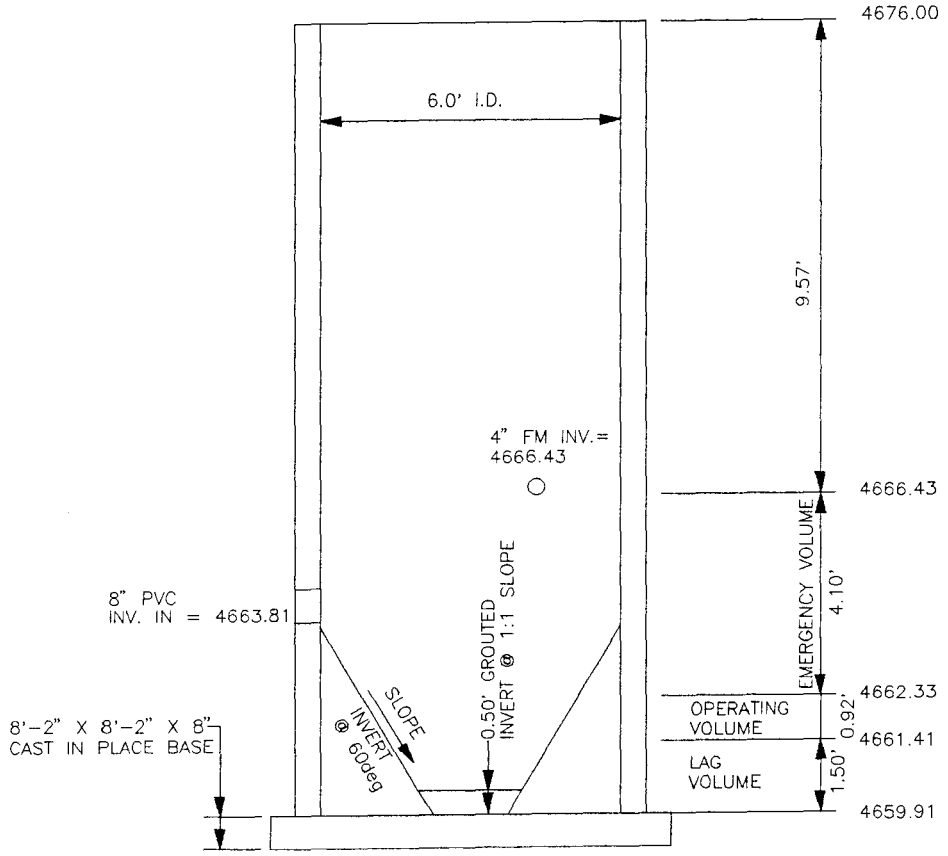
PAGE 12

Doctors offices (per doctor)	250	.80*
Fairgrounds (per person attending)	5	.02
Factories and plants (exclusive of industrial wastes)		
(per employee per 8-hour shift-no showers)	20	.05
(per employee per 8-hour shift - showers provided)	35	.08
Food service establishments (per seat)		
Restaurant (Open 1 or 2 meals)	50	.06/meal served
24-hour Restaurant	75	.07/meal served
Restaurant with paper service only	25	.01/meal served
Additional for bars and cocktail lounges	30	.02
Drive-in Restaurant (per car space)	50	.02
Kennels (per dog)	30	.20
Laundries, self-service (per commercial washer)	400	.75
Office Buildings (per employee per 8-hour shift)	15	.06
Stores and Shopping Centers (per square foot of Retail space)	.1	.01*
Service Stations (per toilet fixture)	250	.50*
Stadiums, Race Tracks, Ball Parks (per seat)	5	.02
Theaters (Movie, Indoor, or Auditorium)	5	.02
Work or construction camps (semi-permanent - with flush toilets)	50	.17
Work or construction camps (semi-permanent - without flush toilets)	35	.02
Institutional (does not include kitchen wastewater flows)		
Churches (not including food)	5	.01
Hospitals (per bed space)	250	.20



NOTE: WETWELL WEIGHT
= 37,871 LBS. EMPTY.

PLAN VIEW
NTS



SECTION A-A
PROFILE VIEW
NTS

SAFEWAY 1533 WETWELL DESIGN

Date: 27-Sep-96

Project: **SAFEWAY COTTONWOOD CENTRE #1533**
Subject: **SANITARY SEWER LIFT STATION DESIGN**

(5) WETWELL BOUYANCY CALCULATIONS

---- Given: 6'-0" I.D. Concrete wetwell.
Total wetwell weight empty = 37,871 LBS.
Base 8'-2" x 8'-2" x 8" = 66.69

---- Freewater @ 8.5' below surface at Test Boring No. 1
Capillary Fringe @ 6.0'

Hydro Static Lift On Wetwell

Capillary Fringe @ 6.0'
(16.76 FT. - 6.0 FT.) x 66.69 SF. x 62.4 LBS/ CF. 44,777.27 LBS

Freewater:
(16.76 FT. - 8.5 FT.) x 66.69 SF. x 62.4 LBS/ CF. 34,373.63 LBS

Potential Lift = 44,777.77 LBS - 37,871 LBS = 6,906.27 LBS

4676' grade at Pump Station
4660.41' end of Suction Line

15.59' Suction Lift

4660.41 end of Suction Line

4669.60 gravity

Static Head = 9.19'

Station Loss = 0.5' at 100 gpm

Friction Loss - 100' 4" PVC F.M.; 100 gpm
1.23'/C' x .54 (C=140) x 1 (100') =
.6642'

TDH = .6642'
+ .5
+ 9.19
10.35' use 11' at 100 gpm

Use 5 & L Pump 4AZB
875 RPM, 1.5 HP

PAGE 116

PVC 140C

TA

Temp F

200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390
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410
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550
560
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580
590
600
610
620
630
640
650
670
690
705

ensities

WATER DATA

Friction losses in pipes carrying water

Among the many empirical formulae for friction losses that have been proposed, that of Williams and Hazen has been most widely used. In a convenient form it reads:

$$f = 0.2083\left(\frac{100}{C}\right)^{1.85}\frac{q^{1.85}}{d^{4.8655}}$$

in which

f = friction head in ft of liquid per 100 ft of pipe (if desired in lb per sq in. multiply f × .433 × sp gr)

d = inside dia of pipe in inches

q = flow in gal per min

C = constant accounting for surface roughness

.2

This formula gives accurate values only when the kinematic viscosity of the liquid is about 1.1 centistokes or 31.5 SSU, which is the case with water at about 60F. But the viscosity of water varies with the temperature from 1.8 at 32F to .29 centistokes at 212F. The tables are therefore subject to this error, which may increase the friction loss as much as 20% at 32F and decrease it as much as 20% at 212F. Note that the tables may be used for any liquid having a viscosity of the same order as indicated above.

Values of C for various types of pipe are given below together with the corresponding multiplier which should apply to the tabulated values of the head loss, f, as given on pages 130 to 144.

TYPE OF PIPE	VALUES OF C: Range — High = best, smooth, well laid — Low = poor or corroded	Average value for good, clean, new pipe	Commonly used value for design purposes
Cement—Asbestos	160–140	150	140
Fibre	—	150	140
Bitumastic-enamel-lined iron or steel centrifugally applied	160–130	148	140
Cement-lined iron or steel centrifugally applied	—	150	140
Copper, brass, lead, tin or glass pipe and tubing	150–120	140	130
Wood-stave	145–110	120	110
Welded and seamless steel	150–80	140	100
Continuous-interior riveted steel (no projecting rivets or joints)	—	139	100
Wrought-iron	150–80	130	100
Cast-iron	150–80	130	100
Tar-coated cast-iron	145–80	130	100
Girth-riveted steel (projecting rivets in girth seams only)	—	130	100
Concrete	152–85	120	100
Full-riveted steel (projecting rivets in girth and horizontal seams)	—	115	100
Vitrified	—	110	100
Spiral-riveted steel (flow with lap)	—	110	100
Spiral-riveted steel (flow against lap)	—	100	90
Corrugated steel	—	60	60

Value of C	150	140	130	120	110	100	90	80	70	60
Multiplier to correct tables	.47	.54	.62	.71	.84	1.0	1.22	1.50	1.93	2.57

PVC = 27

CAMERON HYDRAULIC DATA

Friction Losses In Pipe; C = 100 (For Old Pipe)
4 Inch

FLOW US gal per min	Cast Iron 4.0" inside dia			Std Wt Steel 4.026" inside dia			Extra Strong Steel 3.826" inside dia			Double Extra Strong Steel 3.152" inside dia		
	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft
20	.51	.00	.063	.50	.00	.061	.56	.00	.078	.82	.01	.199
30	.77	.01	.132	.76	.01	.128	.84	.01	.164	1.23	.02	.422
40	1.02	.02	.226	1.01	.02	.219	1.12	.02	.280	1.65	.04	.719
50	1.28	.03	.341	1.26	.03	.330	1.40	.03	.423	2.06	.07	1.09
60	1.53	.04	.477	1.51	.04	.463	1.67	.04	.593	2.47	.10	1.52
70	1.79	.05	.635	1.76	.05	.615	1.95	.06	.789	2.88	.13	2.02
80	2.04	.06	.813	2.02	.06	.788	2.23	.08	1.01	3.29	.17	2.59
90	2.30	.08	1.01	2.27	.08	.980	2.51	.10	1.26	3.70	.21	3.22
100	2.55	.10	1.23	2.52	.10	1.19	2.79	.12	1.53	4.11	.26	3.92
110	2.81	.12	1.47	2.77	.12	1.42	3.07	.15	1.82	4.52	.32	4.67
120	3.06	.15	1.72	3.02	.14	1.67	3.35	.17	2.14	4.94	.38	5.49
130	3.32	.17	2.00	3.28	.17	1.93	3.63	.20	2.48	5.35	.44	6.36
140	3.57	.20	2.29	3.53	.19	2.22	3.91	.24	2.84	5.76	.52	7.30
150	3.83	.23	2.61	3.78	.22	2.53	4.19	.27	3.24	6.17	.59	8.31
160	4.08	.26	2.93	4.03	.25	2.84	4.47	.31	3.64	6.58	.67	9.34
170	4.34	.29	3.28	4.29	.29	3.18	4.75	.35	4.07	6.99	.76	10.5
180	4.60	.33	3.64	4.54	.32	3.53	5.02	.39	4.52	7.40	.85	11.6
190	4.86	.37	4.03	4.79	.36	3.90	5.30	.44	5.00	7.82	.96	12.8
200	5.11	.41	4.43	5.05	.40	4.29	5.58	.48	5.50	8.23	1.05	14.1
220	5.62	.49	5.28	5.55	.48	5.12	6.14	.59	6.56	9.05	1.27	16.8
240	6.13	.58	6.21	6.05	.57	6.01	6.70	.70	7.70	9.87	1.51	19.8
260	6.64	.69	7.20	6.55	.67	6.97	7.26	.82	8.93	10.7	1.8	22.9
280	7.15	.79	8.25	7.06	.77	8.00	7.82	.95	10.2	11.5	2.1	26.3
300	7.66	.91	9.38	7.57	.89	9.09	8.38	1.09	11.6	12.3	2.4	29.9
320	8.17	1.04	10.6	8.07	1.01	10.2	8.94	1.24	13.1	13.2	2.7	33.7
340	8.68	1.17	11.8	8.58	1.14	11.5	9.50	1.40	14.7	14.0	3.0	37.7
360	9.19	1.31	13.1	9.08	1.28	12.7	10.0	1.6	16.3	14.8	3.4	41.9
380	9.70	1.46	14.5	9.59	1.43	14.1	10.6	1.7	18.0	15.6	3.8	46.3
400	10.2	1.6	16.0	10.1	1.6	15.5	11.2	1.9	19.8	16.5	4.2	50.9
420	10.7	1.8	17.5	10.6	1.7	16.9	11.7	2.1	21.7	17.3	4.7	55.7
440	11.2	1.9	19.0	11.1	1.9	18.5	12.3	2.3	23.6	18.1	5.1	60.7
460	11.7	2.1	20.7	11.6	2.1	20.0	12.8	2.5	25.7	18.9	5.6	65.9
480	12.3	2.3	22.4	12.1	2.3	21.7	13.4	2.8	27.8	19.7	6.0	71.3
500	12.8	2.5	24.1	12.6	2.5	23.4	14.0	3.0	30.0	20.6	6.6	76.9
550	14.0	3.0	28.8	13.9	3.0	27.9	15.3	3.6	35.7	22.6	7.9	91.7
600	15.3	3.6	33.8	15.1	3.5	32.8	16.7	4.3	42.0	24.7	9.5	108
650	16.6	4.3	39.2	16.4	4.2	38.0	18.1	5.1	48.7	26.7	11.1	126
700	17.9	5.0	45.0	17.6	4.8	43.6	19.5	5.9	55.8	28.8	12.9	143
750	19.2	5.7	51.1	18.9	5.6	49.5	20.9	6.8	63.4	30.8	14.7	163
800	20.4	6.5	57.6	20.2	6.3	55.8	22.3	7.7	71.5	32.9	16.8	183
850	21.7	7.3	64.4	21.4	7.1	62.4	23.7	8.7	79.9	35.0	19.0	205
900	23.0	8.2	71.6	22.7	8.0	69.3	25.1	9.8	88.9	37.0	21.3	228
950	24.3	9.2	79.1	24.0	9.0	76.6	26.5	10.9	98.2	39.1	23.8	252
1000	25.5	10.1	87.0	25.2	9.9	84.3	27.9	12.1	108	41.1	26.3	277
1100	28.1	12.3	104	27.7	11.9	101	30.7	14.6	129	45.2	31.7	331

Friction

FLOW US gal per min	Cast Iro 5.0" inside	
	Velocity ft per sec	Velocity head ft
30	.49	.00
40	.65	.01
50	.82	.01
60	.98	.01
70	1.14	.02
80	1.31	.03
90	1.47	.03
100	1.63	.04
120	1.96	.06
140	2.29	.08
160	2.61	.11
180	2.94	.13
200	3.27	.16
220	3.59	.20
240	3.92	.24
260	4.25	.28
280	4.58	.33
300	4.90	.38
320	5.23	.43
340	5.56	.48
360	5.89	.54
380	6.22	.60
400	6.54	.66
420	6.87	.73
440	7.20	.81
460	7.52	.88
480	7.85	.96
500	8.17	1.04
550	8.99	1.26
600	9.80	1.49
650	10.6	1.7
700	11.4	2.0
750	12.3	2.4
800	13.1	2.7
850	13.9	3.0
900	14.7	3.4
950	15.5	3.7
1000	16.3	4.1
1100	18.0	5.0
1200	19.6	6.0
1300	21.2	7.0
1400	22.9	8.1
1500	24.5	9.3
1600	26.1	10.6
1700	27.8	12.0

APPENDIX "C"

PUMP SPECIFICATIONS

Smith & Loveless, I

14040 Santa Fe Trail Drive
Lenexa, Kansas 66215
913/888-5201

FALCON SUPPLY COMPANY, INC.
BOX 469
NIWOT, COLORADO 80544-0469
(303) 499-7131 OR (800) 221-7131
FAX (303) 652-3460

"WET WELL MOUNTED"
ON-CLOG PUMPING STATION

SALES AGREEMENT
Page _____ of _____

Name and Address:

Date: 10-11-96

Inquiry Number

Engineer: Monty Stroup

Job Location: Safeway, Grand Junction

Smith & Loveless, Inc., having an office at 14040 Santa Fe Trail Drive, Lenexa, Kansas 66215 (hereinafter referred to as "Seller"), hereby agrees to sell to the buyer designated below (hereinafter referred to as "Buyer"), subject to all of the terms and conditions on the face and reverse sides hereof, the following equipment:

ONE

Smith & Loveless Factory-Built Automatic Pumping Station complete with fiberglass housing, and structural steel base suitable for installation on top of a 6'-0" inside diameter wet well. The principal items of equipment include two vertical, close-coupled, vacuum-primed, 4", 4B2B Smith & Loveless non-clog pumps; each capable of delivering 100 GPM at 11 TDH with a maximum static suction lift of 16', and each driven by 1½ HP, 875 RPM, 3 phase, 60 cycle, 460 volt motor; valves, 4" internal piping; central control panel with circuit breakers; motor starters and automatic pumping level controls; heater; priming pumps; ventilator and all internal wiring.
Also included: insulated hood, aux. electric heater, running time meters, 3 KVA transformer, remote alarm contact, high water alarm sensor, high water alarm light

Price: $ 25,888.00 F.O.B. factory plus any taxes which may apply. Truck/~~RRXXX~~ freight allowed to job site, ~~xxxxxxxxxx~~ or nearest unloading area - unloading to be by Buyer.

Terms: With credit approval, payment terms are Net 30 days. Any variation of these terms must be approved by the Smith & Loveless, Inc., Credit Department.

Submittal of data for approval 1 weeks after receipt of complete details at factory.

Shipment is estimated 8-10 weeks after receipt in Seller's office of approved submittal data.

One day supervision of initial operation is included. If additional days are required, Seller will furnish a factory trained supervisor for $ 600.00 per day including travel time plus actual travel expenses.

THE SALE OF THE EQUIPMENT DESCRIBED ABOVE IS MADE SOLELY ON AND EXPRESSLY SUBJECT TO ALL OF THE TERMS AND CONDITIONS ON THE FACE AND REVERSE SIDES HEREOF.

Agreed to this _____ day of _____, 19____

_____
Buyer

By _____
Authorized Signature

_____
Address

Is this purchase tax exempt? YES _____ NO _____

If YES, attach Sales Tax Exemption Certificate.

Agreed to this _____ day of _____, 19____
at Lenexa, Kansas.

SMITH & LOVELESS, INC.

By _____
Authorized Signature

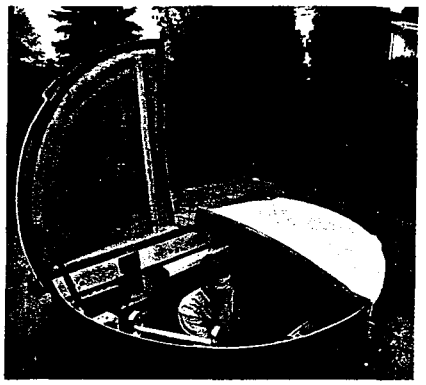
Prepared by _____
Sales Representative
Falcon Supply Co., Inc.

The Sales Representative is not an agent or employee of Seller and is not authorized to enter into any agreement on Seller's behalf or to bind Seller in any way.

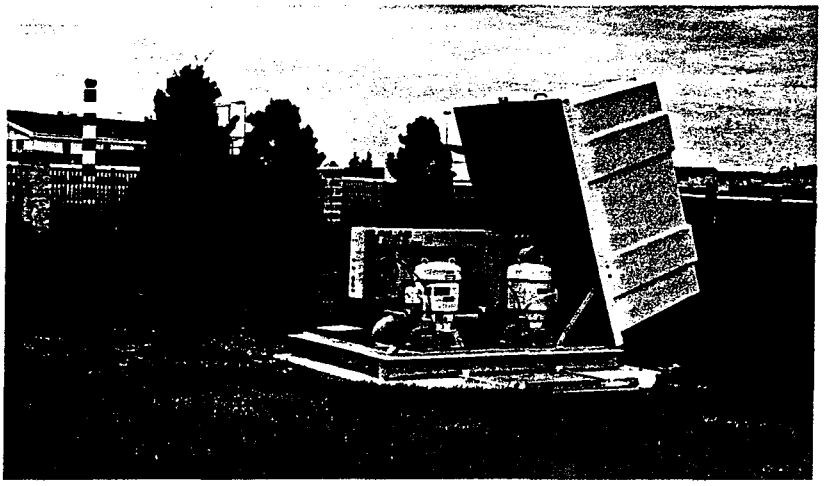
Form No. 04-06-16 5/89

Positive Prime

Pump Stations



Since 1946, over 20,000 installations of Smith & Loveless pump stations have proven to be reliable, cost-effective approaches to water and wastewater transfer needs. Pictured are the Wet Well Mounted Pump Station (below) and the Recessed Wet Well Mounted Pump Station (right).



The Original Wet Well Mounted Pump Station and Recessed Wet Well Mounted Pump Station

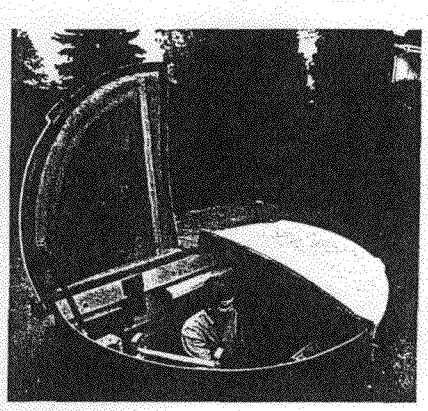
- Single-source responsibility
- Quality non-clog pumps, providing proven low maintenance and minimum parts
- Factory-assembled and tested prior to job site delivery -- minimizes field labor and assembly problems
- Applicable in any environment
- Designed for the operator
- High-operating efficiencies, result in lower power costs
- All mechanical equipment located above the baseplate, allowing ease of inspection, maintenance, and repair
- Duplex, triplex, or series pumping systems with built-in, fail-safe components

Smith & Loveless, Inc.

brochure 607

Positive Prime

Pump Stations



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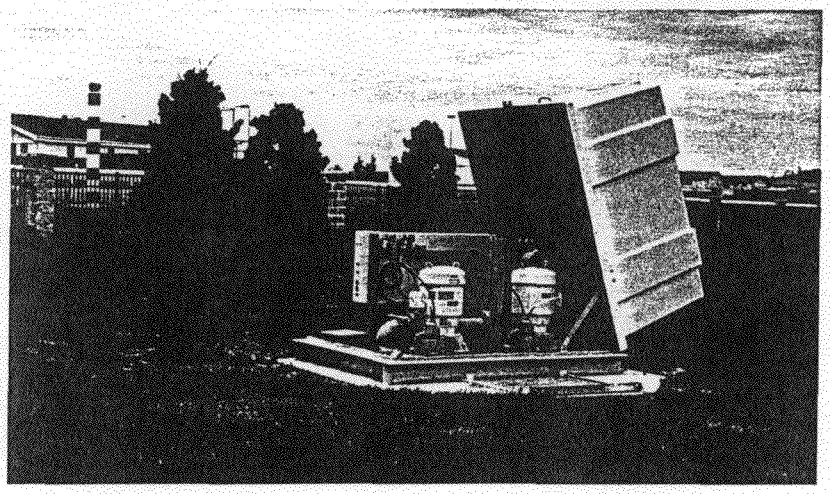

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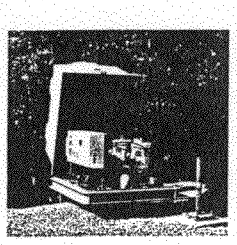
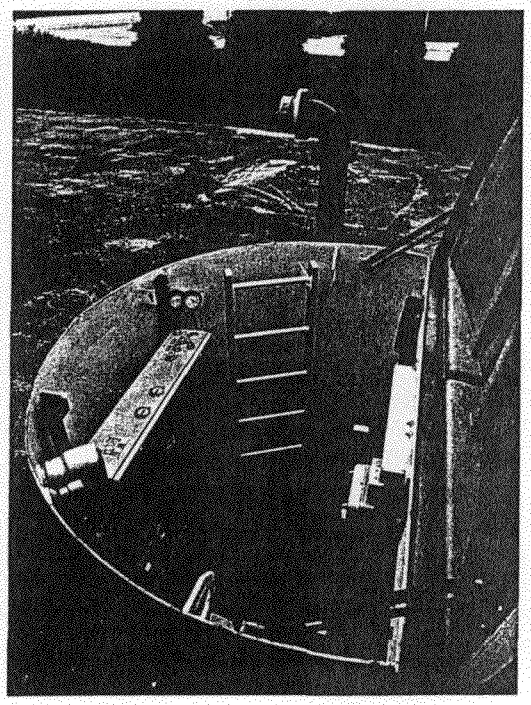
Smith & Loveless, Inc.

Choose the station that fits your needs

It's not only this combination of experience and innovation that has made Smith & Loveless an industry leader, it's also flexibility. The engineers at Smith & Loveless have seen every type of flow situation, and they can custom design a cost-efficient pump station to fit your needs -- whether it's an industrial, municipal or process application.

The fewest parts...the easiest disassembly...the heaviest cross section in the industry...the only pumps specifically designed for positive vacuum priming -- are just a few of the features that make up the best pump stations in the world. But, if you still need proof, ask anybody who already has a Smith & Loveless pump station.



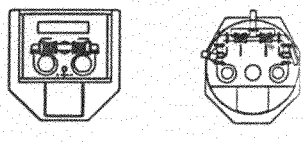


Both types of the Wet Well Mounted Pump Stations, shown here, have equipment housed separately from the permit-required confined space wet well.

Plan Views

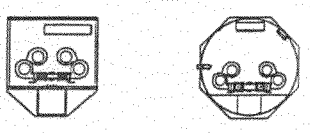
Below, three plan views appear of the Smith & Loveless Wet Well Mounted Pump Station (left) and Recessed Wet Well Mounted Pump Station (right) model lines.

Automatic alternation of pumps, each eight hours on duplex stations (or six hours on triplex stations), distributes wear on the pumps.



Two-pump

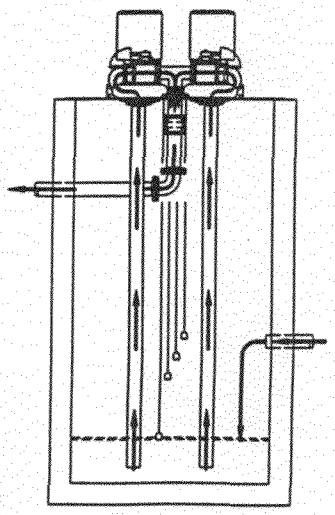
Three-pump



Four-pump Series

Wet Well Mounted Pump Station Flow Scheme

Priming the *Lead Pump* - The liquid level rises in the wet well and tilts the low level "on" displacement switch, which activates the vacuum pump and primes the lead pump. When the liquid level reaches the level-sensing probe in the pump, the pump is primed. The vacuum priming system shuts off, and the lead pump starts. The pump is designed to remain primed from cycle to cycle.



Standby Pump - If the inflow continues to rise, the high level "on" displacement switch is tilted, which activates the priming and pumping cycle of the standby pump.

Transferring Liquid - The liquid is drawn up through the suction pipes to the centrifugal pumps and pumped out through the check valves and plug valves into the force main.

Shutting Off Pumps - The pump lowers the wet well level until the pump low level "off" displacement switch tilts and shuts off the pump. The pumps remain primed; the vacuum pump will not come on unless the liquid level has fallen below the level sensing probe, and the low level "on" displacement switch is tilted.

Design Styles:

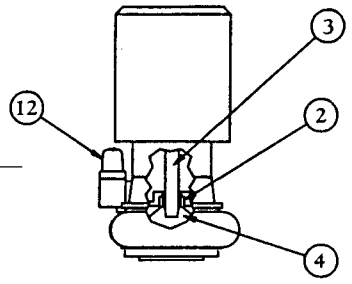
- Sizing 4", 6", 8", and 10" piping;
- 4", 6", and 8" pumps;
- Horsepower ranges from 1.5 to 50 per pump
- GPM up to 5000
- TDH up to 300'
- Models are available to fit standard 4' through 12' diameter wet wells.

Standard Options:

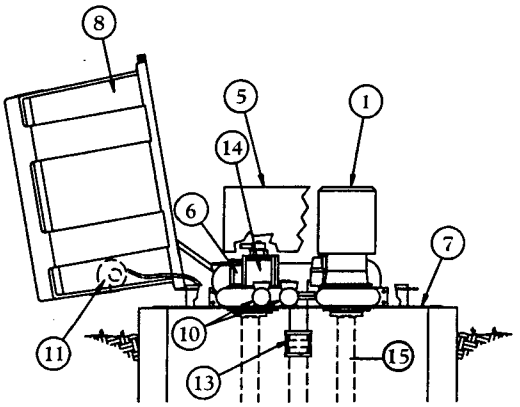
- Turbo vortex-type pump
- Programmable Logic Controller
- Auxiliary heater
- Wet well ventilator
- Bubbler control
- Alarm devices
- Stainless steel
- Steel or concrete wet well
- Insulated Enclosures

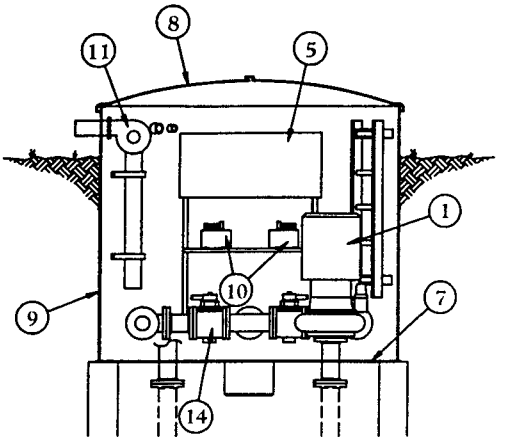
Represented by:

Smith & Loveless, Inc.
14040 Santa Fe Trail Dr.
Lenexa, Kansas 66215-1284
United States of America
Phone: 913-888-5201
Fax: 913-888-2173



Cutaway view of the Wet Well Mounted Pump Station pump





The standard two-pump (above) Recessed Wet Well Mounted Pump Station and (left) Wet Well Mounted Pump Station

Standard Two-Pump Features:

1. Pumps -- Few parts, easy to disassemble, heaviest cross section in the industry

2. Mechanical Seal -- Exclusive S&L seal has one of the longest life spans available on the market

3. Motor -- Solid, oversized stainless-steel shaft with oversized shielded bearings

4. Pump Impeller -- Trimmed individually to exact design capacity with full-diameter shrouds remaining to prevent seal wear and shaft binding. Keyed to tapered shaft for easy removal

5. Control Panel -- NEMA Type 1 with all coded wiring, dead-front design increases operator safety and simplifies service

6. Check Valves -- Spring-loaded, non-slamming check valves with external-arm design

7. Heavy Baseplate -- Separates pumps and motors from wet well

8. Thick Fiberglass Hood -- Provides protection, ventilation louvers, complete access for service and maintenance

9. Equipment Chamber -- Low, above-grade profile separated from the wet well entrance, meets the Ten States Standards requirements

10. Vacuum Pumps -- Duplex vacuum pumps for positive priming are mounted for easy inspection and maintenance

11. Ventilation-Heating -- High capacity, low noise level squirrel-cage blowers, thermostatically controlled electric heater *(optional in recessed)* with optional hood insulation

12. Level Sensing Probe -- Enclosed within transparent dome for visual inspection of priming

13. Discharge Pipe -- Compression type coupling provides for ease of installation and flexibility

14. Plug Valves -- Easy 1/4 turn operation, positive seal for individual pump isolation

15. Suction Line -- There is nothing else down in the wet well except the float switches

Solutions for a World of Water Problems

Design Styles:

- Sizing 4", 6", 8", and 10" piping;
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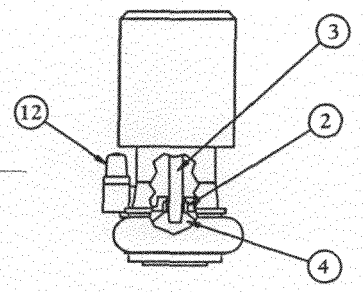

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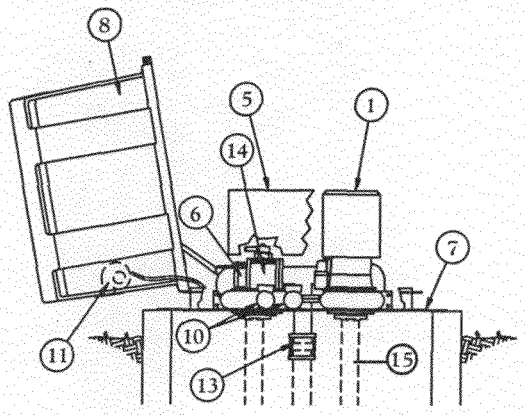

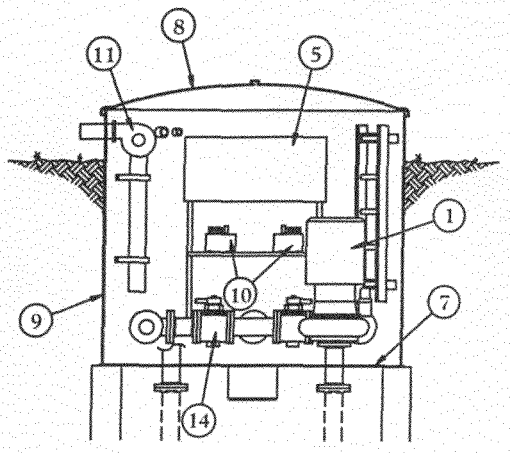

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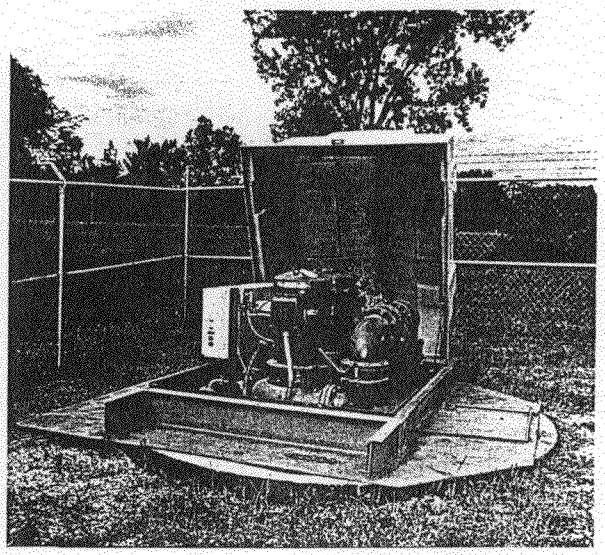
Solutions for a World of Water Problems

Innovations

Some of the newest design innovations include increased flow capacity with the addition of a proven 8" pump and a unique high-head application station, which combines all 4 pumps, piping and controls in a single compact station. Innovative applications in which the Smith & Loveless positive-primed stations have proven themselves include: recycle pumping for trickling filters, landfill leachate pumping and sludge pumping inside treatment plants.



Maintenance is easy with the Wet Well Mounted Pump Station since all of the equipment is located above grade.

Ask anyone

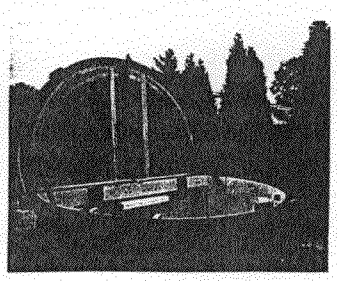
With close to a half century of experience in the industry, Smith & Loveless has solved water and wastewater transfer and treatment problems the world over. In 1948, B. Alden Smith and Compere Loveless installed the first factory-built pump station in Salina, Kansas -- thus changing wastewater transfer forever. Since then, the Smith & Loveless team has taken this experience and combined it with foresight and innovation to create new products and to make constant improvements on existing products.

Just throw open the hood

Perhaps the most notable characteristic of the Smith & Loveless Wet Well Mounted Pump Station is the location of the mechanical equipment. By housing all pumps, motors, and controls above the baseplate and under a fiberglass hood, inspection and maintenance are as easy as checking the oil in your car. Just throw open the hood. This above baseplate design also keeps equipment separate from permit-required confined space. The Wet Well Mounted Pump Station's compact design, low noise level and modern appearance help maintain a low profile in any environment.

Place the benefits just below grade

The Smith & Loveless Recessed Wet Well Mounted Pump Station combines the benefits of the Wet Well Mounted Pump Station with those of a buried station. The low profile is ideal for cold climates because all equipment is earth insulated. The equipment chamber also keeps pumps and motors away from the wet well in a regularly ventilated environment. This just below-grade version also allows for pumping from deeper gravity mains for wider pumping head applications.



The low profile is ideal for cold climates because all equipment is earth insulated.

SPECIFICATIONS

WET WELL MOUNTED PUMP STATION WITH DUPLEX TWO-PORT IMPELLER TYPE NON-CLOG PUMPS

GENERAL

The contractor shall furnish and install one factory-built, automatic pumping station as manufactured by Smith & Loveless, Inc., Lenexa, Kansas. The station shall be complete with all needed equipment, factory-installed on a welded steel base with fiberglass cover.

The principal items of equipment shall include two vertical, close-coupled, motor driven, vacuum primed, two-port impeller type non-clog Turbo pumps; valves; internal piping; central control panel with circuit breakers; motor starters and automatic pumping level controls; heater; ventilating blower; priming pumps and appurtenances; and all internal wiring.

OPERATING CONDITIONS

Each pump shall be capable of delivering 100 GPM of raw water or wastewater against a total dynamic head of 11 feet. The minimum acceptable pump efficiency at this condition shall be 50%. Due to the energy conservation requirements, the minimum efficiency will be enforced. The maximum allowable speed shall be 875 RPM. The minimum rated horsepower of each pump motor shall be 1.5. The maximum static suction lift shall be 16'.

All openings and passages shall be large enough to permit the passage of a sphere 3" in diameter. The anticipated operating head range is from 8 feet minimum to 12' maximum. The pump motors shall not be overloaded beyond their nameplate rating at the design conditions nor at any head in the operating range.

CONSTRUCTION

The station shall be constructed in one complete, factory-built assembly. It shall be sized to rest on the top of the wet well as detailed in the construction drawings. The supporting floor plate shall be minimum 3/8" thick steel with reinforcing, as required, to prevent deflection and ensure an absolutely rigid support.

The pump station shall be enclosed by a hinged fiberglass cover. The cover shall have a suitable drip-lip around the edge and shall be provided with a hasp and staple connection to the floor plate to allow the pump chamber to be locked with a padlock.

The cover shall have a latch mechanism to keep the cover open under load. Adjustable ventilating louvers shall be provided on each end of the fiberglass cover which are capable of being closed during cold weather operation.

An aluminum manway cover, located exterior to the fiberglass pump chamber, shall be provided, complete with padlocking provisions. The manway shall be an integral part of the station floor plate and provide access to the wet well.

A stanchion with lifting arm shall be provided to lift each pump. The lifting arm shall have a hook over the center of the motor to support a hoist (provided by others) for removal of the motors, impellers and pumps from the station.

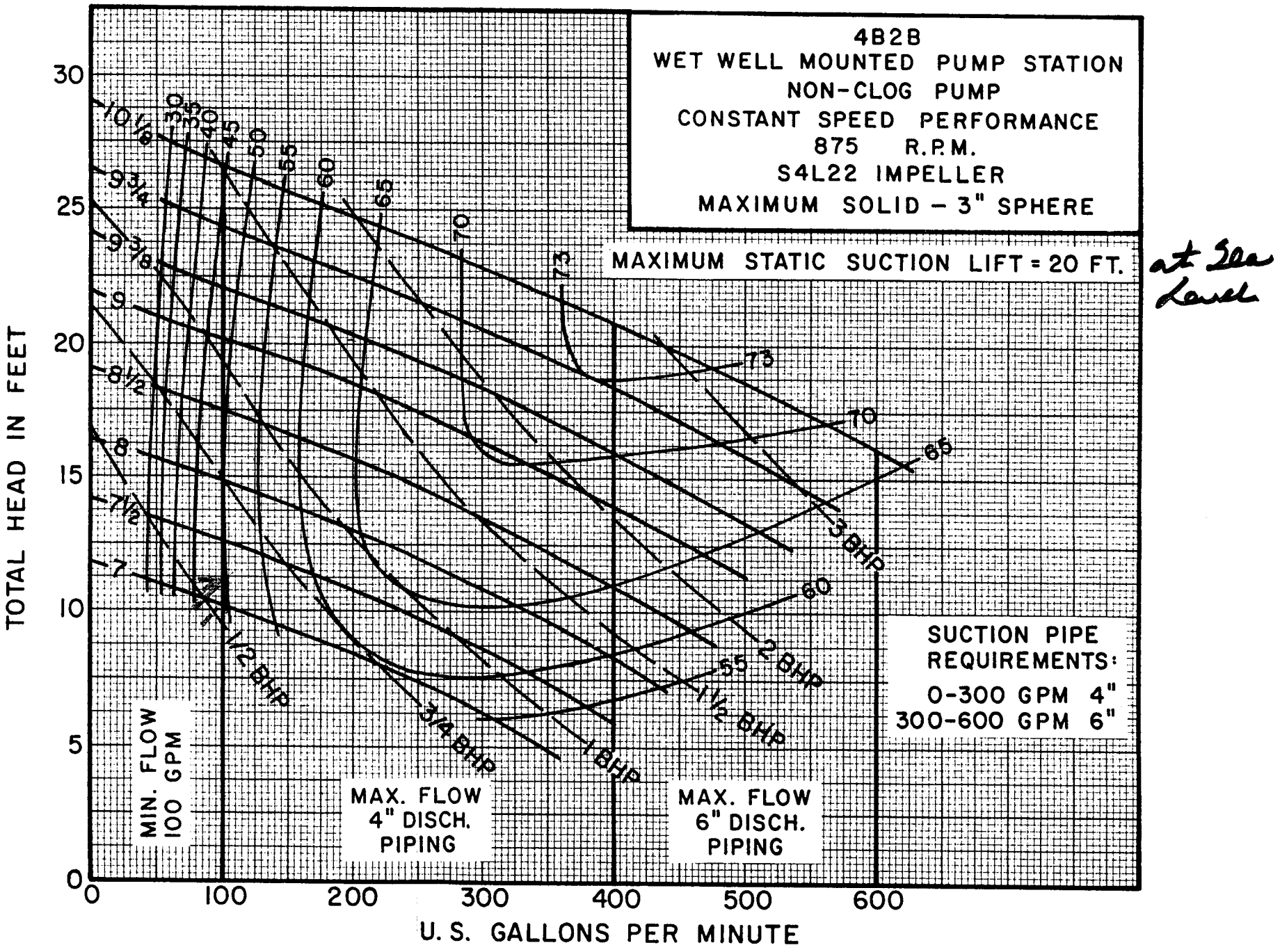
The pump volutes and discharge piping shall be mounted in relation to the floor plate as detailed in the construction drawings.

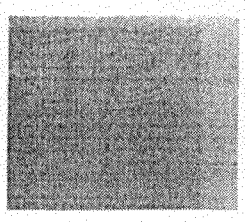
WELDING

All steel structural members shall be joined by electric arc welding with welds of adequate section for the joint involved.

PROTECTION AGAINST CORROSION

All structural steel surfaces shall be factory blasted with steel grit to remove rust, mill scale, weld slag, etc. All weld spatter and surface roughness shall be removed by grinding. Surface preparation shall comply with SSPC-SP6 specifications. Immediately following cleaning, a single 6-mil dry film thickness of Versapox® shall be factory applied. This coating shall be as formulated by Smith & Loveless for abrasion and corrosion resistance.


4B2B
WET WELL MOUNTED PUMP STATION
NON-CLOG PUMP
CONSTANT SPEED PERFORMANCE
875 R.P.M.
S4L22 IMPELLER
MAXIMUM SOLID – 3" SPHERE
MAXIMUM STATIC SUCTION LIFT = 20 FT.
at Sea Level
SUCTION PIPE REQUIREMENTS:
0-300 GPM 4"
300-600 GPM 6"
MIN. FLOW 100 GPM
MAX. FLOW 4" DISCH. PIPING
MAX. FLOW 6" DISCH. PIPING
3 BHP
2 BHP
1½ BHP
1 BHP
¾ BHP
½ BHP
TOTAL HEAD IN FEET
U. S. GALLONS PER MINUTE
0
5
10
15
20
25
30
100
200
300
400
500
600



Stainless steel, aluminum and other corrosion-resistant surfaces shall not be coated. Carbon steel surfaces not otherwise protected shall be coated with a suitable non-hardening rust preventative compound. Auxiliary components such as the electrical enclosure, ventilating blower and vacuum pumps shall be furnished with the original manufacturer's coating.

Finish coating shall be accomplished prior to shipment of the station from the factory and shall comply fully with the intent of these specifications. A touch-up kit shall be provided by the pump station manufacturer for repair of any mars or scratches occurring during shipping and installation. This kit shall contain detailed instructions for use and shall be the same material as the original coating.

MAIN PUMPS

The pumps shall be (4") (X) (X) vertical, non-clog two-port impeller type of heavy cast iron construction, especially designed for the use of mechanical seals and vacuum priming. In order to minimize seal wear caused by linear movement of the shaft, the shaft bearing nearest the pump impeller shall be locked in place so that end play is limited to the clearance within the bearing. To minimize seal wear resulting from shaft deflection caused by the radial thrust of the pump, the shaft from the top of the impeller to the lower bearing supporting the impeller shall have a minimum diameter of 1-7/8" for motor frame sizes 213 through 286; 2-1/8" for motor frame sizes 324 and 326; and 3" for frame 364 and larger. The dimension from the lowest bearing to the top of the impeller shall not exceed 6".

The bearing nearest the impeller shall be designed for the combined thrust and radial load. The upper bearing shall be free to move in a linear direction with the thermal expansion of the shaft and shall carry only radial loads.

The shaft shall be solid stainless steel through the mechanical seal to eliminate corrosion and abrasive rust particles. Removable shaft sleeves will not be acceptable if the shaft under the sleeve does not meet the specified minimum diameter.

The pump impeller shall be of the enclosed type made of close-grained cast iron and shall be balanced. The impeller shall be keyed with a stainless steel key and secured to the motor shaft by a stainless steel cap screw equipped with a Nylock or other suitable self-locking device. The impeller shall not be screwed or pinned to the motor pump shaft and shall be readily removable without the use of special tools. To prevent the buildup of stringy materials, grit and other foreign particles around the pump shaft, all impellers less than full diameter shall be trimmed inside the impeller shrouds. The shrouds shall remain full diameter so that close minimum clearance from shrouds to volute is maintained. Both the end of the shaft and the bore of the impeller shall be tapered to permit easy removal of the impeller from the shaft.

The pump shall have an adapter providing a large water reservoir above the impeller to provide for positive exclusion of air from the impeller. The seal shall be inside this area to assure lubrication. Pumps which do not use hollow priming adapters for positive lubrication of the seal will not be acceptable.

The pump shall be constructed so as to permit priming from the lower pressure area behind the impeller. Priming from high pressure connections, which tends to cause solids to enter and clog the priming system, will not be acceptable. The priming bowl shall be transparent, enabling the operator to monitor the priming level.

The pump shall be arranged so that the rotating element can easily be removed from the casing without disconnecting the electrical wiring or disassembling the motor, impeller, backhead or seal, so that any foreign object may be removed from the pump or suction line.

The pump shaft shall be sealed against leakage by a single mechanical seal constructed so as to be automatically drained and primed each time the pump is drained and primed. Water which lubricates the mechanical seal shall be automatically drained from around the seal if the pump loses prime in order to allow both the pump and the seal to be drained, thereby preventing freezing and breakage of the seal during power outages in sub-freezing temperatures.

The seal shall be of carbon and ceramic materials with the mating surfaces lapped to a flatness tolerance of one light band. The rotating ceramic shall be held in mating position with the stationary carbon by a stainless steel spring.

The pump volute shall be furnished with mounting lugs and bolted to the station floor plate, forming a gas-tight seal.

MOTORS

The pump motors shall be vertical, solid shaft, NEMA P-base, squirrel-cage induction type, suitable for 3 phase, 60 cycle, 460 volt electric current. They shall have Class F insulation. Insulation temperature shall, however, be limited to Class B. The motors shall have normal starting torque and low-starting current, as specified by NEMA Design B characteristics. They shall be open drip-proof design with forced air circulation by integral fan. Openings for ventilation shall be uniformly spaced around the motor frame. Leads shall be terminated in a cast connection box and shall be clearly identified.

The motors shall have 1.15 service factor. The service factor shall be reserved for the owner's protection. The motors shall not be overloaded beyond their nameplate rating, at the design conditions, nor at any head in the operating range as specified under Operating Conditions.

The motor-pump shaft shall be centered, in relation to the motor base, within .005". The shaft runout shall not exceed .003".

The motor shaft shall equal or exceed the diameter specified under Main Pumps at all points from immediately below the top bearing to the top of the impeller hub.

A bearing cap shall be provided to hold the bottom motor bearing in a fixed position. Bearing housings shall be provided with fittings for lubrication as well as purging old lubricant.

The motor shall be fitted with heavy lifting eyes or lugs, each capable of supporting the entire weight of the pump and motor.

CONTROLS

The control equipment shall be mounted in a NEMA Type 1 steel enclosure with a removable access cover. The circuit breakers, starter reset buttons, and control switches shall be operable without removing the access cover, for deadfront operation.

A grounding type convenience outlet shall be provided on the side of the cabinet for operation of 120 volt AC devices.

Thermal magnetic air circuit breakers shall be provided for branch disconnect service and short circuit protection of all motor control and auxiliary circuits.

Magnetic across-the-line starters with under-voltage release and overload coils for each phase shall be provided for each pump motor to give positive protection. Each single-phase auxiliary motor shall be equipped with an over-current protection device in addition to the branch circuit breaker, or shall be impedance protected. All switches shall be labeled and a coded wiring diagram shall be provided.

To control the operation of the pumps with variations of liquid level in the wet well, a minimum of three (3) displacement switches shall be provided. A 30' cord shall be provided with each switch. The cord shall have a corrosion-resistant vinyl jacket and be multi-stranded in order to prevent fatigue.

An automatic alternator with manual switch shall be provided to change the sequence of operation of the pumps every eight hours. Alternating the pumps at less than eight-hour intervals will not be acceptable.

Provisions shall also be made for the pumps to operate in parallel should the level in the wet well continue to rise above the starting level for the low level pump.

HIGH WET WELL LEVEL ALARM [ ] ~~(Optional Item - Check If Required)~~

An adjustable displacement switch shall be provided to sense a high water level condition. The switch shall hang into the wet well and shall activate a contact to indicate the high water condition.

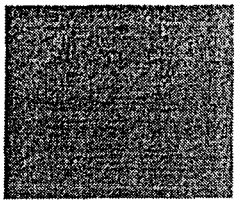
VACUUM-PRIMING SYSTEM

A vacuum priming system shall be furnished to prime the main pumps. The system shall be as shown on the vacuum priming schematic and shall include two vacuum pumps, providing 100 percent standby. Vacuum pumps shall have corrosion-resistant internal components. The vacuum priming system shall be complete with vacuum control solenoid valves, prime level sensing probes, float-operated check valves to protect the vacuum pumps, and all necessary shut-off valves as shown on the piping schematic. The float-operated check valves shall have a transparent body for visual inspection.

The priming system shall automatically provide positive lubrication of the mechanical seal each time a main pump is primed. To prevent excessive stoppage due to grease accumulation, no passageway in the priming system through which the pumped liquid must pass shall be smaller than the equivalent of a 2-1/2" opening.

ENVIRONMENTAL EQUIPMENT

A ventilating blower capable of delivering 250 CFM at 0.1" static water pressure shall be provided in order to remove the heat generated by continuous motor operation. The ventilating blower shall be turned on and off automatically by a preset thermostat. A louvered opening shall cover the discharge. An electric heater controlled by a preset thermostat shall be furnished. The heater shall be rigidly mounted in the station to prevent removal.



MAIN PIPING

The pump suction shall be drilled and tapped for a 125 pound American Standard flange for easy connection of the suction riser. The discharge line from each pump shall be fitted with a clapper-type check valve and eccentric plug valve. Size, location and quantity of check valves and plug valves shall be as shown on the construction drawing. The check valve shall be of the spring-loaded type with external lever arm and an easily replaced resilient seat for added assurance against vacuum leaks. Check valves shall have stainless steel shaft with replaceable bronze shaft bushings and shall be sealed with an adjustable Teflon seal. An operating wrench shall be provided for the plug valves.

Protrusions through the floor plate shall be gas-tight where necessary to effect sealing between the equipment chamber and the wet well. Bolted and sealed joints shall be provided at the pump casings or suction pipes in order to prevent corrosive, noxious fumes from entering the station. The pump station manufacturer shall extend the suction and discharge connections below the floor plate at the factory so that field connections can be made without disturbing the gas-tight seals.

The manufacturer of the pump station shall provide a compression-type sleeve coupling for installation in the common discharge pipe.

FACTORY TESTS

All components of the pump station shall be given an operational test at the pump station manufacturer's facility to check for excessive vibration or leaks in the piping or seals, and to correct operation of the automatic control and vacuum priming systems and all auxiliary equipment. Installed pumps shall take suction from a deep wet well, simulating actual service conditions. The control panel shall undergo both a dry logic test and a full operational test with all systems operating.

Factory test instrumentation must include flow measuring with indicator; compound suction gauge; bourdon tube type discharge pressure gauge; electrical meters to measure amperes, volts, kilowatts and power factor; speed indicator; and a vibrometer capable of measuring both amplitude and frequency.

SPARE PARTS

A complete replacement pump shaft seal assembly shall be furnished with each pump station. The spare seal shall be packed in a suitable container and shall include complete installation instructions. A spare casing and seal gasket shall be provided.

INSTALLATION AND OPERATING INSTRUCTIONS

Installation of the pump chamber shall be done in accordance with the written instructions provided by the manufacturer.

Operation and maintenance manuals shall be furnished which will include parts lists of components and complete service procedures and troubleshooting guide.

START-UP

The Manufacturer shall provide the services of a factory-trained representative for a maximum period of one day on-site to perform initial start-up of the pump station and to instruct the owner's operating personnel in the operation and maintenance of the equipment.

WARRANTY

SMITH & LOVELESS, INC., Lenexa, Kansas, manufacturer of the Factory Built Pump Station, warrants it to be free from defects in materials and workmanship for a period of up to one year commencing at the time the pump station is placed in operation by SMITH & LOVELESS-authorized personnel, but in no event is the pump station warranted for longer than 18 months from the date of shipment unless extended warranty is purchased form the manufacturer. This warranty is contingent upon start-up of the equipment by SMITH & LOVELESS-authorized personnel, and THE WARRANTY WILL BE VOIDED IF START-UP IS PERFORMED BY ANYONE ELSE.

SMITH & LOVELESS will be the single source of responsibility to the owner for the warranty of the pump station and all its components provided by SMITH & LOVELESS.

During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions and if the pump station has been environmentally and physically protected prior to start-up and has been installed and is being operated and maintained in accordance with the written instructions provided by SMITH & LOVELESS, SMITH & LOVELESS will repair or exchange at our discretion such defective part free of charge. Defective parts must be returned by the owner postage paid to SMITH & LOVELESS, if so requested.

When covered by the above warranty, SMITH & LOVELESS will provide, without cost to the owner, such labor as may be required to replace, repair or modify the following, but no other, major components: the steel structure, principal pumps, pump motors, suction and discharge piping and valve assembly. Except for labor provided by SMITH & LOVELESS under the preceding

sentence, the cost of labor and any other expenses resulting from replacement of defective parts and from installation of parts furnished under this warranty shall be borne by the owner.

SMITH & LOVELESS will not assume responsibility for the cost of any repairs or alterations made to the pump station structure or its components unless SMITH & LOVELESS has given specific written authority therefor.

The replacement or repair of parts normally consumed in service, such as pump seals, light bulbs, oil, grease, packing, V-belts, etc. is considered part of routine maintenance and upkeep and such parts are not eligible for repair or exchange free of charge under this warranty.

SMITH & LOVELESS makes no other warranty expressed or implied and SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY AS TO THE MERCHANTABILITY OF THE FACTORY BUILT PUMP STATION OR AS TO ITS FITNESS FOR ANY PARTICULAR PURPOSE. SMITH & LOVELESS is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defects in design, material, workmanship, or delays in delivery, replacements, or repairs.

The waiver or abridgment of any single provision or group of provisions, either by ruling or agreement, shall not be construed to alter or void any other provisions of this warranty.

MANUFACTURER'S INSURANCE

ALL EQUIPMENT MANUFACTURERS, either direct or subcontractors to the general or mechanical contractors, SHALL HAVE in effect at TIME OF BID, CONTRACT AWARD, CONTRACT PERFORMANCE, and WARRANTY TERM, PRODUCT AND COMPREHENSIVE LIABILITY INSURANCE, INCLUDING SUDDEN AND ACCIDENTAL POLLUTION COVERAGE in the amount of FIVE MILLION DOLLARS, $5,000,000, through an insurance company with a minimum rating of A+ (SUPERIOR) XV according to the BEST'S INSURANCE REPORTS. All policies must be written on an OCCURRENCE BASIS. Policies written on a CLAIMS MADE BASIS are not acceptable. The CERTIFICATE OF INSURANCE attesting to the specified coverage issued by the responsible carrier naming the ENGINEER OF RECORD and the OWNER as ADDITIONAL INSURED must be presented to the named additional insured prior to bid and contract award. A FAILURE TO COMPLY with this requirement BY THE BIDDER will require DISQUALIFICATION of the BID and CONTRACT AWARD.

MANUFACTURED EQUIPMENT

Option 1 (Standardization) [delete this line from final spec text]

The specifications and drawings detail Smith & Loveless equipment and represent the minimum standard of quality for both equipment and materials of construction. The contractor shall prepare his bid on the basis of the particular equipment and materials specified for the purpose of determining the low bid.

The owner has standardized on the named equipment in order to optimize their operation, facilitate maintenance and safety programs, provide for interchangeability of costly equipment items, reduce stocking levels required for necessary spare parts and provide increased flexibility in the utilization of their treatment equipment. Equipment substitutions, since incompatible with the district's standardizations program, will not be considered.

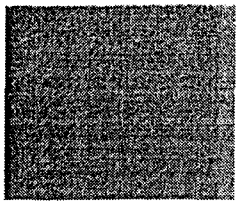
Options 2 & 3 (Base Bid with Bid Submittal) (Pick Option 2 or 3) [delete this line from final spec]

(2) Contractor's Submittal with Bid [delete this line from final spec]

The specifications and drawings detail Smith & Loveless equipment and represent the minimum standard of quality for both equipment and materials of construction. The contractor shall prepare his bid on the basis of this equipment for the purpose of determining the low bid without consideration of a possible substitute. Substitution of other makes may be considered if the equipment proposed for substitution is superior or equal in quality and efficiency to the standards of quality named in the specifications and this is demonstrated to the satisfaction of the engineer. Contractors wishing to offer a deduct for substitute equipment shall include the following submittal information with their proposal.

(3) Manufacturer's Submittal Prior to Bid [delete line from final spec]

The specifications and drawings detail Smith & Loveless equipment and represent the minimum standard of quality for both equipment and materials of construction. The contractor shall prepare his bid on the basis of this equipment for the purpose of determining the low bid without consideration of a possible substitute. Substitution of other makes may be considered if the equipment proposed for substitution is superior or equal in quality and efficiency to the standards of quality named in the specifications and this is demonstrated to the satisfaction of the engineer. Approval for the substitution shall be by written addendum only, and if approved may be bid as a substitute in the appropriate space on the bid form, in addition to



the mandatory base bid. To receive consideration, three (3) sets of detailed submittal on the proposed substitution shall be in the engineer's hands at least 21 working days prior to the opening of bids.

Bid Submittal

This submittal shall include all necessary information for the proper determination of the acceptability of the proposed substitution and shall not necessarily be limited to the following.

A. Complete description of the equipment, system, process, or function, including a list of system components and features, drawings, catalog information and cuts, manufacturer's specifications, including materials description.
B. Performance data and curves, and horsepower requirements.
C. Outside utility requirements, such as water power, air, etc.
D. Functional description of any internal instrumentation and control supplied including list of parameters monitored, controlled, or alarmed.
E. Addresses and phone numbers of nearest service centers and a listing of the manufacturer's or manufacturer's representatives' services available at these locations, including addresses and phone numbers of the nearest parts warehouses capable of providing full parts replacement and/or repair services.
F. A list of five installations in the states where similar equipment by the manufacturer is currently in similar service; include contact name, telephone number, mailing address of the municipality or installation, engineer, owner, and installation contractor; if five installations do not exist, the list shall include all that do exist, if any.
G. Detailed information on site, architectural, structural, mechanical, plumbing, electrical, and control, and all other changes or modifications to the design and construction work necessary to adapt the equipment or systems to the arrangement shown and/or functions described on the drawings and in the technical specifications. This shall include plan view and section sketches illustrating any additional space requirements necessary to provide the minimum adequate clear space within and around the equipment for operation and maintenance, as shown on the drawings and specified.
H. All differences between the specifications and the proposed substitute equipment shall be clearly stated in writing under a heading of "differences".
I. Other specified submittal requirements listed in the detailed equipment and material specifications.

Evaluation

Approval of the substitution to bid as an alternate shall in no way relieve the contractor from submitting the specified shop drawings for approval or complying fully with all provisions of the specifications and drawings.

If substituted equipment is accepted, the contractor shall, at his own expense, make any changes in the structures, piping, electrical, etc. necessary to accommodate the equipment. If engineering is required due to substitution of alternate equipment, the contractor shall pay for all engineering charges.

To receive final consideration, copies of the manufacturers' quotations for the equipment may be required to document the savings to the satisfaction of the engineer. It is the intent that the owner shall receive the full benefit of the savings in cost of equipment and the contractor's bid price shall be reduced by an amount equal to the savings. In all technical and other evaluations, the decision of the engineer is final.

TYPICAL BID FORM [add to bid form]

The bid shall be based on the named equipment. Alternate/substitute equipment may be offered, provided all conditions of the "manufactured equipment" section are met.

Alternate/substitute manufacturer _____

DEDUCT $_____.

ENGINEERING DATA

Smith & Loveless, Inc.
14040 W. Santa Fe Trail Dr.
Lenexa, Kansas 66215

Operator Assist Alarm - A momentary contact, manually operated switch shall be mounted on the face of the station control panel and shall actuate an alarm signal when operated. This switch shall function as an emergency operator assist alarm and provide for testing of the alarm system.

ALARM SYSTEMS - ALARM DEVICES

Alarm Light 120 VAC - A vapor-proof light fixture with 50 watt lamp for outdoor pole mounting.

With red globe and guard.
With green globe and guard.
With amber globe and guard.
With clear globe and guard.

Alarm Horn 120 VAC - A vibratone type horn mounted on a weather tight box suitable for pole mounting.

Alarm Bell 120 VAC - A vibratory type bell mounted on a weather tight box suitable for pole mounting.

Horn or Bell Silence Switch - An on-off switch mounted in a weather tight box suitable for pole mounting.

An on-off switch mounted in the station control panel.

Note: The on-off must be manually reset after the fault is cleared to place the alarm circuit in the ready condition.

Horn or Bell Silence Switch With Automatic Reset Relay - A push to silence pushbutton with control relay to automatically reset the alarm circuit to the ready condition after the fault is cleared.

Mounted in the station control panel.

Mounted in a separate NEMA 1 enclosure.

Mounted in a separate weather proof enclosure.

Mounted in a separate NEMA 1 enclosure with red fault indicating panel mounted light.

Push To Test - Push to test feature added to the silence pushbutton to indicate the alarm devices and system is in normal operating condition.

Remote Telemetering

Remote Alarm Panel - An alarm panel to show faulty conditions shall be provided for installation at a remote location.

The panel shall operate from a 115 volt AC power supply at the remote point. The panel shall include rectifiers and necessary devices to supply filtered direct current to conform to telephone system requirements.

The fault sensors to be used with this panel shall be of the normally closed type and shall open to indicate an alarm condition. The system shall be
fail-safe so that an open in the telephone line shall indicate a failure.

The panel shall indicate an alarm condition by a red light as a visual indication and a horn as an audible signal. A silencing switch shall be provided to turn off the horn.

Mounted in a NEMA 1, compact, sheet steel cabinet with hinged door. The switches indicating light and horn shall be mounted on the door.

(10) ALARM SYSTEM ACCESSORIES

12 Volt DC Battery Charger - Storage batteries and charger shall be supplied to furnish power for alarm conditions in cases of power failure.

The storage batteries (2 - 3 cell, 6 volt) shall be maintenance-free lead-calcium battery concealed in high impact, heat resistant, and permanently sealed containers.

The battery charger shall be solid-state capable of restoring battery to full charge within 12 hours after a discharge not exceeding 1.5 hours. Brown out protection is standard and will activate the unit when A.C. line voltage drops below 85 volts.

Alarm Light 12 Volts DC - A vapor-proof light fixture with 50 watt lamp for outdoor pole mounting.

With red globe and guard.
With green globe and guard.
With amber globe and guard.
With clear globe and guard.

Smith & Loveless, Inc.
14040 W. Santa Fe Trail Dr.
Lenexa, Kansas 66215

Alarm Horn 12 Volts DC - A vibratone type horn mounted on a weathertight box suitable for pole mounting.

Horn Silence Switch - An on-off switch mounted in a weathertight box suitable for pole mounting.

(14) RUNNING TIME METER

A running time meter shall be supplied for each pump to show the number of hours of operation. The meter shall be enclosed in a dust and moisture-proof molded plastic case. The flush mounted dial shall register in hours and tenths of hours up to 9999.9 hours before repeating. The meter shall be suitable for operation from a 115 volt, 60 cycle supply.

(15) ELECTRIC HEATER

A 1300/1500 watt, dual range, electric heater with automatic circulating fan, thermostat control and an on-off switch is to be provided. The heater is to be operated by connection to the convenience receptacle located on the control panel.

(17) LARGER SUCTION LINES

Larger Suction Lines for Duplex Pump Stations - Refer to general product specification for description.

(18) SIDE DISCHARGE

The common discharge pipe and the discharge outlet shall be _____ inch, Class 150, cast iron pipe projecting through the side wall of the station, with a plain end just outside the pump chamber.

(19) PRESSURE GAUGE ON PUMP DISCHARGE

A pressure gauge with a brass stop valve and manual air relief fittings shall be installed at the discharge of each pump.

(20) TOOL BOX

A metal tool box complete with the following tools shall be provided. This complement of tools shall include all tools necessary to replace the pump mechanical seal.

1. 9/16" x 1/2" box end wrench
2. 3/4" x 5/8" open end wrench
3. 15/16" x 1" open end wrench
4. 1-1/8" socket
5. 8" T-handle 11"x 1/2" drive
6. 1/2" x 5-1/2" drive extension
7. 6" pipe wrench
8. #3 rawhide mallet
9. Ratchet type hoist
10. Motor lifting bar
11. Lint free cloth
12. Multi-purpose grease

If 230 volt 4 wire source NOT Avail

(21) TRANSFORMER

A ~~(2)~~ (3) KVA insulating type transformer shall be provided to supply power for lights, controls and auxiliary devices. The transformer shall have 240/480 volt primary, 120/240 volt secondary, Class F insulation, with temperature rise not to exceed 115 C above a 40 C ambient. The core and coil assembly shall be given a double dip and bake. The coil shall be protected by a metal housing to prevent damage.

(22) WET WELL LEVEL GAUGE

A low pressure diaphragm gauge with a 2-1/2" dial calibrated 0"- 100" of water shall be connected to the air bubbler system to indicate the sewage level in the wet well.

(23) TWO-SPEED PUMP OPERATION - DUPLEX PUMP STATION

Motors - The pump motors shall be vertical, solid shaft, two-speed, two-winding, variable torque, protected drip-proof, induction type, suitable for 3 phase, 60 cycle, _____ volt electric current. The motors shall have normal starting torque and low starting current characteristics. The motors shall not be overloaded at the design condition, nor beyond the nameplate rating plus the standard NEMA 1.15 service factor at any head in the operating range.

Operating Conditions - Each pump shall be capable of delivering _____ GPM against a total dynamic head of ____ ft. at _____ RPM, and a secondary condition of _____ GPM against a total dynamic head of _____ ft. at _____ RPM, of raw sewage.

The minimum rated horsepower of each pump motor shall be at a maximum allowable speed of _____ RPM.

All openings and passages shall be large enough to permit the passage of a sphere 3" in diameter and any trash or stringy material which can pass through a 4" house collection system.

(43) TIME DELAY RELAY TO PREVENT SIMULTANEOUS STARTING

Adjustable time delay relays shall be provided to prevent simultaneous starting of the pump motors after power failure.

(45) INSULATED HOOD

The wet well mounted pup station shall be enclosed by a hinged, insulated, fiberglass cover, complete with drip lip, cutouts for ventilation system and hasp to allow the pump station to be locked with a padlock. The insulation shall be minimum 1" urethane.

(48) PHASE CONVERTER PILOT RELAYS

Terminals and/or pilot relays shall be provided in the lift station control panel to facilitate connection to an external phase converter unit.

NOTE: *Consulting engineer should designate the type/manufacturer of phase converter.*

(52) PRIME ALARM

A 5-minute time delay relay shall be connected to each vacuum pump. Contacts shall be provided to automatically shut down the operating vacuum pump, allow starting of the next pump in the operating sequence and signal an alarm on excessive vacuum pump operating time.

Contacts shall be provided for transmitting a (local) (remote) (local and remote) alarm signal.

(55) LEVEL-1 SOLID STATE TWO-PUMP CONTROLLER

The control equipment shall be mounted in a NEMA Type 1 steel enclosure with dead fron*t control and a hinged access cover. The circuit breakers, starter reset buttons, and control switches shall be operable without opening the access cover, for deadfront operation.

A GFI type convenience outlet shall be provided on the side of the cabinet for operation of 120 volt AC devices.

Thermal magnetic air circuit breakers shall be provided for branch disconnect service and short circuit protection of all motor control and auxiliary circuits.

Magnetic across-the-line starters with under-voltage release and overload coils for each phase shall be provided for each pump motor to give positive protection. Each single-phase auxiliary motor shall be equipped with an over-current protection device in addition to the branch circuit breaker, or shall be impedance protected. All switches shall be labeled and a coded wiring diagram shall be provided.

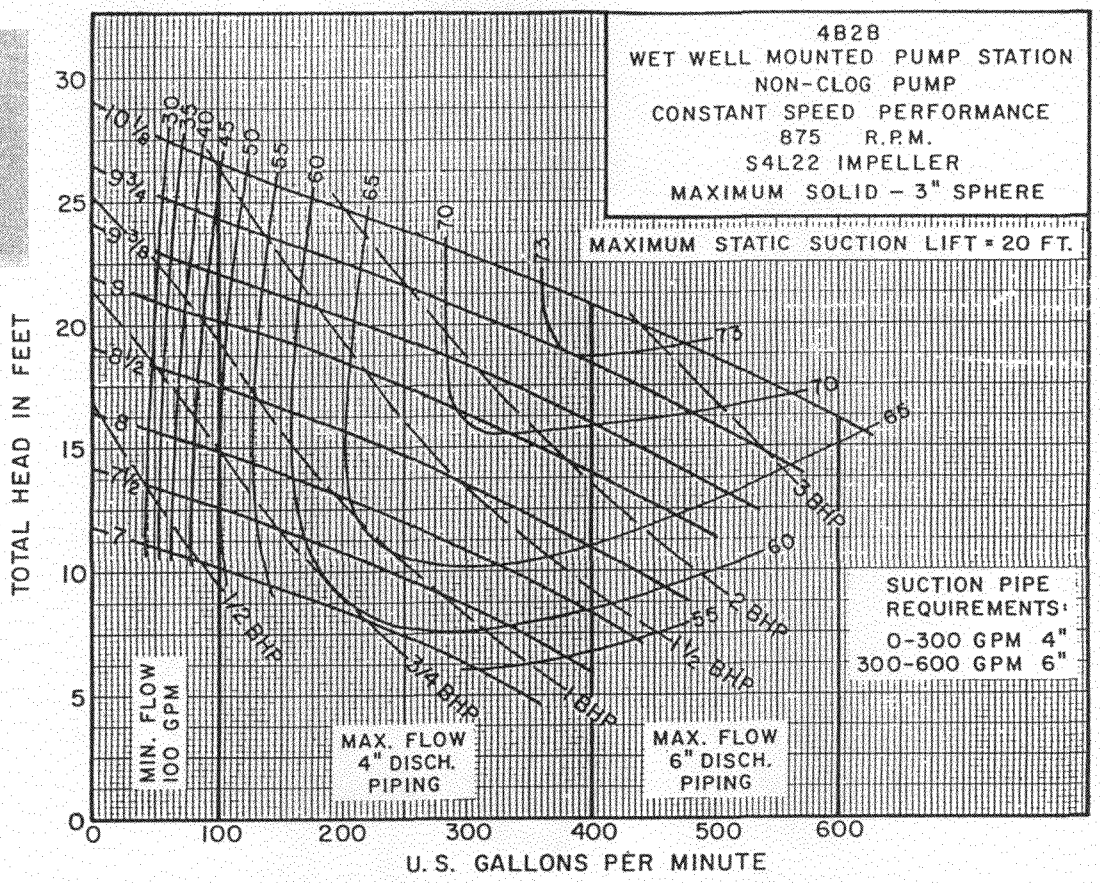
A low pressure bubbler air line shall provide a pneumatic signal to the solid state pump controller, to control the operation of the pumps with variations of liquid level in the wet well.

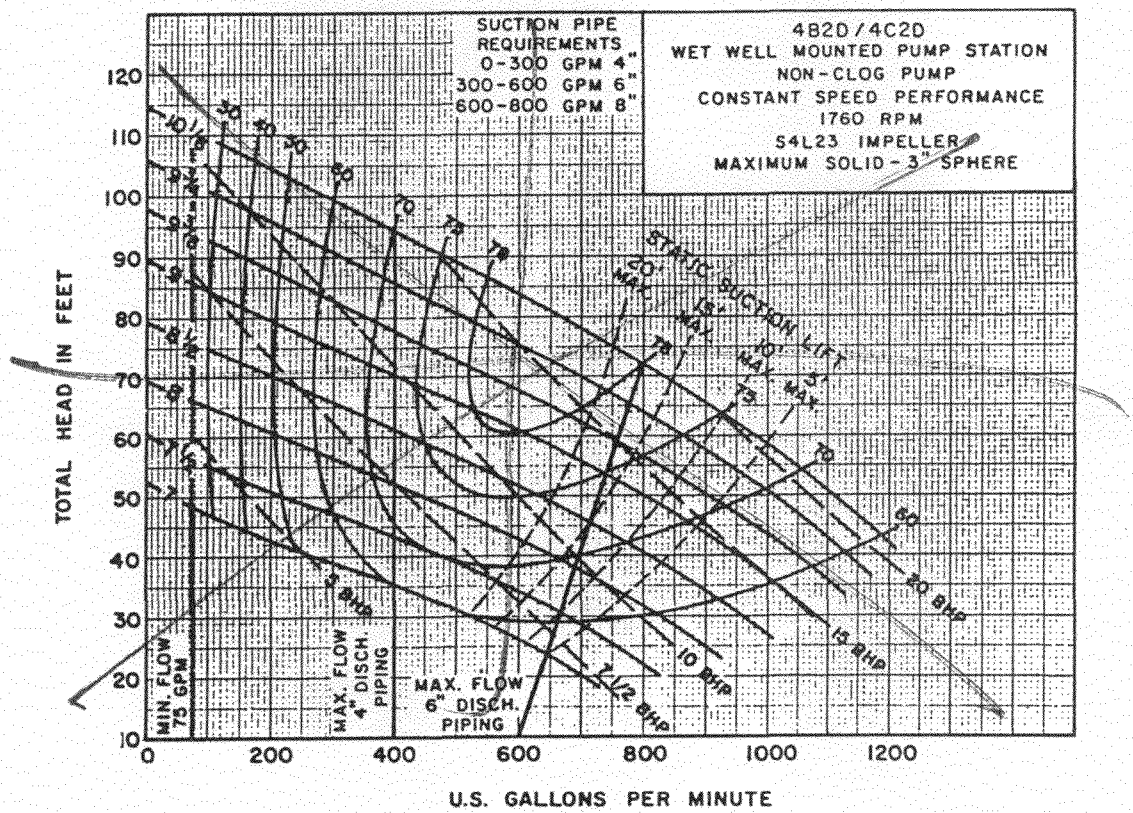
A low pressure bubbler system shall be provided with two air compressors, a bubbler tube and a ported, panel mounted test valve to simulate rising and falling liquid level in the wet well. This shall provide the operator the means to check the correct starting and stopping levels for the pumps and that the alarm system is functioning.

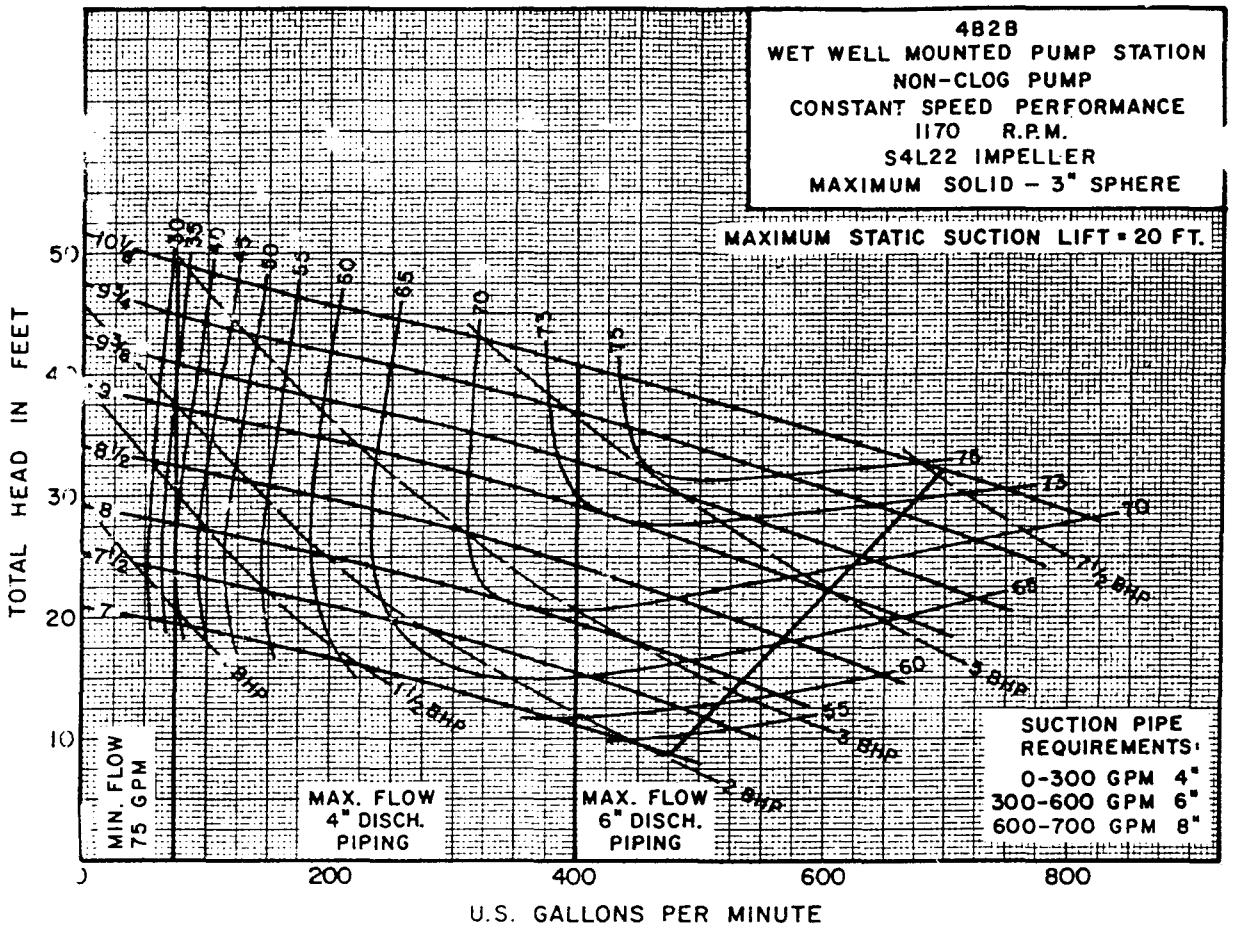
The two air compressors shall be of the close-coupled, oil-less type. Each compressor shall have a minimum capacity of 0.2 cubic feet of free air per minute at 10 PSI. It shall incorporate a single-phase, 60 cycle, 120 volt, drip-proof, brushless type electric motor. A motor-driven timer shall be provided to automatically alternate the compressors every five minutes. Wiring and piping of the air compressors shall be arranged so that one compressor may be removed without removing the other compressor from service.

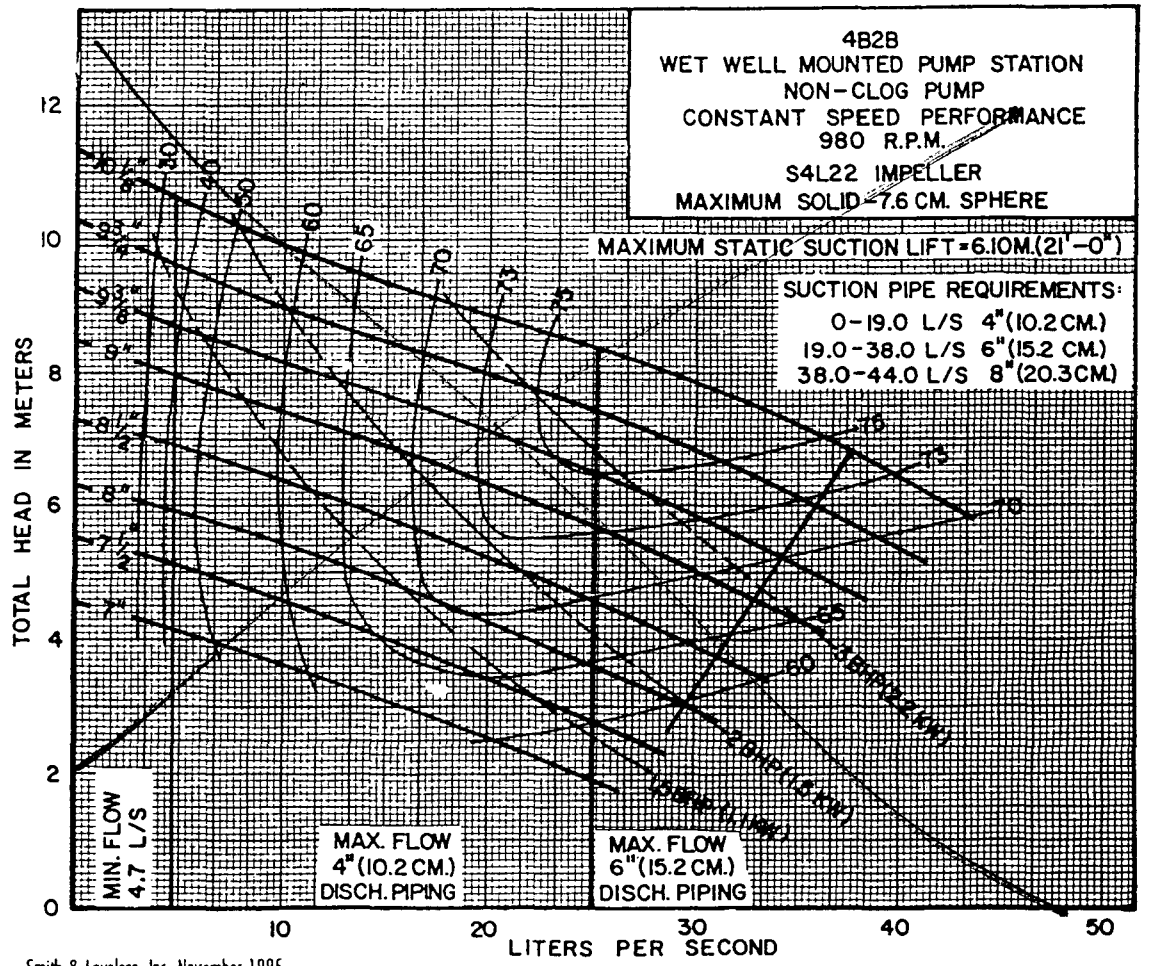
The solid state pump controller shall incorporate a Smith & Loveless, Inc. microprocessor capable of controlling the operation of the two pumping units. There shall be no moving parts located in the wet well that affect operation of the controller. Grease, sludge or biological growth shall not affect the accuracy or reliability.

A backup displacement switch system shall be provided to operate the pumps and signal an alarm should failure of the Level-I Controller occur. This standby system shall be activated automatically and provide ON-OFF control for both pumps. Systems that do not provide 100% standby will not be acceptable.


4B2B
WET WELL MOUNTED PUMP STATION
NON-CLOG PUMP
CONSTANT SPEED PERFORMANCE
875 R.P.M.
S4L22 IMPELLER
MAXIMUM SOLID – 3" SPHERE
MAXIMUM STATIC SUCTION LIFT = 20 FT.
SUCTION PIPE REQUIREMENTS:
0-300 GPM 4"
300-600 GPM 6"
MIN. FLOW 100 GPM
MAX. FLOW 4" DISCH. PIPING
MAX. FLOW 6" DISCH. PIPING
TOTAL HEAD IN FEET
U. S. GALLONS PER MINUTE


SUCTION PIPE REQUIREMENTS
0-300 GPM 4"
300-600 GPM 6"
600-800 GPM 8"
4B2D/4C2D
WET WELL MOUNTED PUMP STATION
NON-CLOG PUMP
CONSTANT SPEED PERFORMANCE
1760 RPM
S4L23 IMPELLER
MAXIMUM SOLID-3" SPHERE
STATIC SUCTION LIFT
MIN. FLOW 75 GPM
MAX. FLOW 4" DISCH. PIPING
MAX. FLOW 6" DISCH. PIPING
TOTAL HEAD IN FEET
U.S. GALLONS PER MINUTE



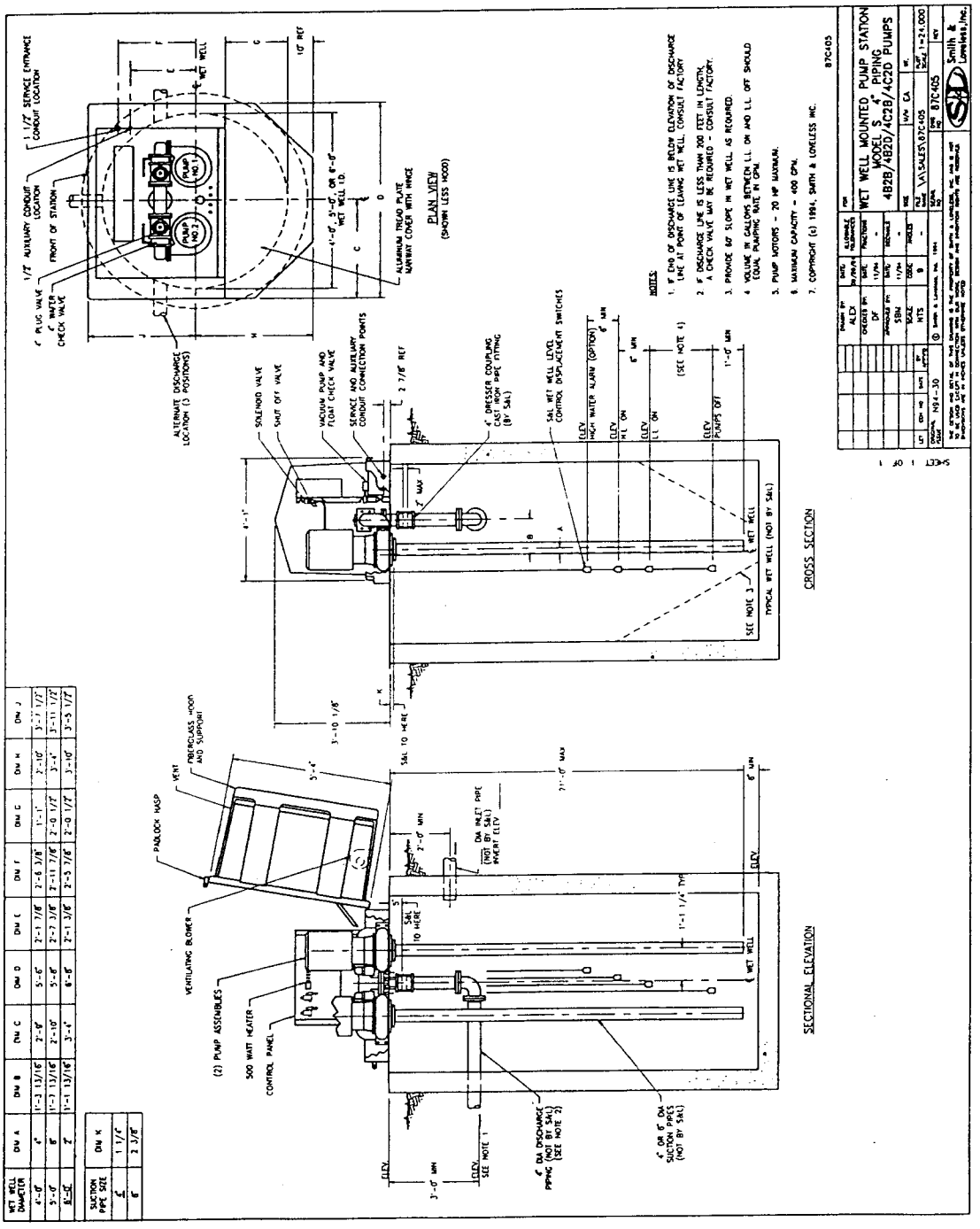


Water & Wastewater Wet Well Mounted Pump Station

DRAWINGS

4B2B/4B2D/4C2B/4C2D PUMPS 4" PIPING

Drawing 87C405



WET WELL DIAMETER	DIM A	DIM B	DIM C	DIM D	DIM E	DIM F	DIM G	DIM H	DIM J
4'-0"	4"	1'-1 13/16"	2'-9"	5'-6"	2'-1 7/8"	2'-8 3/8"	1'-1"	2'-10"	3'-1 1/2"
5'-0"	6"	1'-1 13/16"	2'-10"	5'-6"	2'-2 3/8"	2'-11 7/8"	2'-0 1/2"	3'-4"	3'-11 1/2"
8'-0"	8"	1'-1 13/16"	3'-4"	6'-5"	2'-1 3/8"	2'-5 7/8"	2'-0 1/2"	3'-10"	3'-5 1/2"

SUCTION PIPE SIZE	DIM K
4"	1 1/4"
6"	2 3/8"

APPENDIX "D"

29 ROAD SOILS EXPLORATIONS

SUBSURFACE SOILS EXPLORATION

SAFEWAY STORE #1533

GRAND JUNCTION, COLORADO

Prepared For:

SAFEWAY INC.
6900 S. YOSEMITE
ENGLEWOOD, COLORADO

Prepared By:

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

September 18, 1996

Lincoln DeVore, Inc.
Geotechnical Consultants
1441 Motor St.
Grand Junction, CO 81505
TEL: (970) 242-8968
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September 18, 1996

SAFEWAY INC.
6900 S. Yosemite
Englewood, Colorado

Re: SUBSURFACE SOILS EXPLORATION

SAFEWAY STORE #1533

GRAND JUNCTION, COLORADO

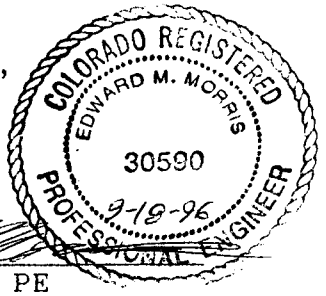
Dear Sir:

Transmitted herein are the results of a Subsurface Soils Exploration for the proposed construction of approximately 400' of sanitary sewer to replace the existing Central Grand Valley Sanitation District sewer South to manhole-OR 104.

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

Respectfully submitted,

LINCOLN-DeVORE, INC.



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

LD Inc. Job No. 85669-J

EMM/bl

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herein to match the described construction to the soil characteristics found. The information contained herein may or may not be valid for other purposes. If the proposed site use is changed or types of construction proposed, other than noted herein, Lincoln DeVore should be contacted to determine if the information in this report can be used for the new construction without further field evaluations.

PROJECT SCOPE

The purpose of our exploration was to evaluate the surface and subsurface soil and geologic conditions of the site and, based on the conditions encountered, to provide recommendations pertaining to the geotechnical aspects of the site development as previously described.

The results of the exploration borings form the project and the previous Subsurface Soils Exploration used to characterize the Safeway property have been utilized for this analysis. The conclusions and recommendations included herein are based on an analysis of the data obtained from our field explorations, laboratory testing program, and on our experience with similar soil and geologic conditions in the area.

This report provides site specific information for the construction of a sanitary sewer and to provide recommendations regarding sewer line construction, manhole construction and trench stability for this project.

FIELD EXPLORATION AND LABORATORY TESTING

A field evaluation was performed on 8-23-96, and consisted of a site reconnaissance by our geotechnical personnel and the drilling of 6 shallow to medium depth exploration borings. These 6 exploration borings were drilled along the proposed sewer alignment, avoiding existing utility structures, near the locations indicated on the Boring Location Plan. The exploration borings were located to obtain a reasonably good profile of the subsurface soil conditions. All exploration borings were drilled using a CME 45-B, truck mounted drill rig with continuous flight auger to depths of approximately 7-43 feet. Samples were taken with a standard split spoon sampler, thin walled Shelby tubes, and by bulk methods. Logs describing the subsurface conditions are presented in the attached figures.

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

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

The following laboratory tests were performed on representative soil samples to determine their relative engineering properties.

ASTM D-2487	Soil Classification
ASTM D-2435	One Dimensional Consolidation
ASTM D-3080	Direct Shear Strength, Cd
ASTM D-2937	In-Place Soil Density
ASTM D-2216	Moisture Content of Soil

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

FINDINGS

SITE DESCRIPTION

The project site is located at the Southwest corner of the Safeway Property and continues along the right-of-way of 29 Road for 400 feet, beginning approximately 500' South of F (Patterson) Road, all within the City of Grand Junction, Colorado.

The topography of the site is relatively flat with a general drainage to the South. The project is located on the constructed 29 Road and involves the asphalt pavement structure and the drainage/borrow ditch on the West side of 29 Road. The exact direction of surface runoff on this site is to the South, along the existing drainage/borrow ditch. Surface drainage on this site can be described as fair to good and subsurface drainage is fair to poor.

GENERAL GEOLOGY AND SUBSURFACE DESCRIPTION

The geologic materials encountered under the site consist of approximately 31' to 41' of unconsolidated alluvial soils which overlie the Mancos Shale Formation, which is considered to be bedrock in this area. The geologic and engineering properties of the materials found in our 6 exploration borings will be discussed in the following sections.

The soils on this site consist of alluvium/colluvium transported by mudflows from the hills to the North and Northeast. This stratification of upper soils results in a layered system of silts and clays with thin, interbedded

sand lenses overlying the Mancos Shale Formation. Generally, the silts and clays are soft, wet and of low to very low density. Soil density decreases and the moisture content increases with increasing depth. The upper 1-8 feet of the soil profile is composed on man-made fills associated with the construction of 29 Road and the installation of numerous utilities.

The soils on this site were found to be very similar to the Soil Types I and II described in the report of the Subsurface Soils Exploration for Safeway Store #1533, performed by Lincoln DeVore Inc., January 31, 1996, LDTL Job #84768-J.

The upper alluvial soils encountered on this site generally classify as a silty clay (ML-CL) under the Unified Classification System. As the soils are the product of debris flows from the Bookcliffs, to the North, the soils are composed of fragments of shale, siltstone and mudstone of the upper Mancos Shale Formation and the lower Mesa Verde Formation. The texture of the native soils is similar to a silty, clayey sand, with the sand and some gravel sized particles being composed of siltstone and mudstone. If these coarser fragments are not severely worked or disturbed, they will behave as a clayey, sandy silt. If these materials are subjected to extensive compaction effort or reworking by equipment, the fragments will break down and the soils will behave as a silty clay.

These soils were encountered in a low to very low density condition and are very soft. These soils, at the approximate pipeline elevation, have a gross bearing capacity

of approximately 800-1000 psf. It should be noted that this gross bearing capacity, at this depth is sufficient to support the existing soils but, will not support additional weight without some consolidation.

The soils which will be excavated for the sewer installation and utilized for support of the sewer construction are below the water table identified during this exploration program. These saturated soils will be extremely soft and unstable. As the soils are composed of granular fragments of siltstone and mudstone, these soils behaved much as permeable silty and clayey sands when excavated and when subjected to hydrostatic pressures. If these soils are excavated below the water table, the excavation bottom will tend to heave. Excessive excavation below the water table will produce an inward flowing of the soils from below the trench sides. As trench supporting is to be utilized, the flowing from the side will be somewhat minimized but upheaval of the soils from the bottom will be maximized. As the soils upheave in the trench bottom, a "quick" condition is produced. In affect, any unsupported or partially supported excavation much more than 1' to 2' below the water table will result in an unstable condition commonly known as quicksand.

GROUND WATER:

A free water table came to equilibrium during drilling at 8 to 9-1/2 feet below the present ground surface (asphalt pavement surface of 29 Road). This is probably not a true phreatic surface but is an accumulation of subsurface

seepage moisture (perched water). In our opinion the subsurface water conditions shown are a permanent feature on this site. The depth to free water would be subject to fluctuation, depending upon external environmental effects.

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

Data presented in this report concerning ground water levels are representative of those levels at the time of our field exploration. Groundwater levels are subject to change seasonally or by changed environmental conditions. Quantitative information concerning rates of flow into excavations or pumping capacities necessary to dewater excavations is not included and is beyond the scope of this report. If this information is desired, permeability and field pumping tests will be required.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL DISCUSSION

No geologic conditions were apparent during our reconnaissance which would preclude the sewer line installation as planned however, rather difficult trench side and trench bottom conditions will be encountered. Based on our investigation to date and the knowledge of the proposed construction, the site condition which would have the greatest effect on the planned sewer installation is the high ground water table. The low density, native soils will experience moderately severe instability when encountered below the capillary fringe of the ground water table. The existing capillary fringe was found to be from 6-1/2' to 8-1/2' below the present ground surface.

The native soils on this site exhibit a very low bearing capacity. When these soils are disturbed, such as during excavations at or below the existing water table, the soils will tend to heave into the excavation. Structures placed on these soils which have heaved, whether pipelines or manhole type structures, will tend to settle during and after the soil backfill process. In addition, the trench sides will be very unstable, requiring shoring and bracing.

It should be noted that if soil flowage occurs from below the excavation or from the sides of the excavation, ground loss will be experienced outside of the excavation

limits. This ground loss will be recognized by settlement of the ground surface, outside the excavated area. In addition, existing structures, to include underground utilities and existing power poles will probably settle and or move in toward the excavation. Much of the effects of the ground loss will probably be experienced during the excavation and backfill process but, continued adjustment of the ground and utilities outside of the excavation may continue for an extended period after construction is completed.

We recommend that the amount of cut be kept to a minimum along this alignment. The amount of vertical cut will be determined by the sewer line elevation and by the amount of stabilization required beneath the pipe and manhole structures. It must be emphasized that the greater the excavation below the established water table, the greater amount of instability (quick condition), will be experienced by the native soils in the excavation.

EXCAVATION ALTERNATIVES

Based upon the shear strength characteristics of the subsurface soils obtained in the exploration program, the maximum stable cut slope which can be constructed in this material is 1.8 to 1 (H to V) for soils in the drain state and a factor of safety of 1.3. It must be noted that these cut slopes assume the water table can be lowered, by dewatering to a depth equal to the base of the excavation. It is assumed the water table will have to be lowered 5' to 8', to allow excavation for unbraced sides and to allow sufficient depth for stabilization beneath the pipeline and the manhole structures. It must be noted that for a 12' to 15'deep excavation, the unsupported, excavated trench width will be approximately 46' to 57' wide. It is anticipated similar soil conditions exist either East or West of the present sewer line alignment and would apply whether the sewer line is constructed at virtually any location within the existing 29 Road right-of-way.

Several methods of slope retention were investigated for this site. Following is a summary of the methods investigated and a short discussion.

Alternate 1

Installation of sheet piling is probably the most viable solution. The prevention of trench bottom soil heaving would require the sheet piling extend a minimum of 15' below the proposed bottom excavation elevation. Due to the soil conditions of the area and the assumed requirement that signif-

icant ground loss outside the excavation cannot be tolerated, the sheet piling cannot be cantilevered and will require internal bracing to resist the lateral soil pressures. The actual design of the internal bracing will depend entirely upon the amount of excavation anticipated for this site and the sheet piling material utilized.

Alternate 2 The use of in situ ground freezing through the installation of freezing pipes. The basic problem with this alternative is the method is unproven in this area and requires very specialized personnel and equipment. Failure of an artificially frozen soil mass or barrier can have serious implications. It is our understanding that most failures are partial in nature and generally do not involve catastrophic events. Due to the time restraints of this project, artificial ground freezing is probably not feasible.

Alternative 3

Two parallel grout curtains, probably reinforced, could be placed in lieu of sheet piling. Such grout columns would retain the soils on both sides of the excavation but, would require site dewatering to at least the base of the sewer pipe. The grout columns would have to extend a minimum of 15' below the proposed bottom excavation limit, to maintain sufficient resistance to heave of the trench bottom. This grout column could be placed in a number of ways, utilizing compaction grouting techniques, jet grouting techniques or permeation grout-

ing which uses chemicals rather than a concrete grout. The permeation grouting would probably be the least successful in this area.

Support of Manhole Structures

The existing, recently placed manhole (MH-1) at the Southwest corner of the Safeway property has reportedly experienced in excess of 0.2 feet of settlement since the manhole backfill was placed. This condition is expected to be experienced for any additional manholes placed in the 29 Road right-of-way or the alternate "Lift" Station placed near MH-1.

It is recommended any proposed manhole and "Lift" station structures be supported by either compaction grout columns which extend from the underlying Mancos Shale Formation to the base of the proposed manhole structure, by the installation of mini-piles which extend to the Mancos Shale Formation or by full sized driven steel piling.

The compaction grout techniques can be accomplished by a local contractor and may be the easiest to schedule for this project. The installation of mini-piles must be done by specialty contractors, which, while one is located in the Grand Junction area, can be very difficult to schedule on short notice. Mini-piles are essentially small diameter steel piles which individually have a relatively low load bearing

capacity, as compared to normal piling installed in the Grand Junction area. The fall sized driven pilling would be similar to the piling supporting the Safeway Building.

If compaction grouting techniques are utilized to support the manhole structures, the grout columns can be installed either prior to or after initial excavation has been accomplished. The grout columns would be non-reinforced , be terminated at or near the anticipated base of the manhole structure and 1' to 2' of structural/stabilization fill placed beneath the manhole structure base. The grout columns could efficiently be placed in a triangular pattern, approximately 3' to 4' between points. The grout should have a 28 day compressive strength of at least 800 psi, when tested using procedures outlined in ASTM-C-39. The Portland Cement must be formulated to be alkali resistant but, need not be a Type V.

Similar compaction grouting could be performed adjacent to the manhole which has undergone settlement (MH-1). It is possible that, by utilizing bottom up grouting techniques, the manhole can be raised. If the first compaction grout point does not accomplish lift of the structure, a top down type procedure could be utilized. The top down procedure, while more expensive, should accomplish the required lift. It is recommended the grout utilized for the lift procedure be as stiff as can be pumped.

Driven Piles:

We recommend that driven piles bear in the competent materials of the underlying Mancos Shale Formation. We anticipate that driving refusal will be encountered within a few feet of penetration into the Mancos Shale Formation. Based on a static analysis, piles driven to refusal may be designed for an allowable tip bearing capacity of 70 to 90 tons. A round, closed-end pipe pile bearing area would be the area of the pile end plate. Pile driving refusal should be determined by our representative in the field. Generally, pile driving refusal is taken as a maximum of 15 blows per inch.

It is anticipated that steel piling (large displacement,concrete filled pipe) will be utilized in this construction. The following recommendations will assume the use of these materials. If wood or concrete piling are anticipated, recommendations can be readily provided.

Driving hammers should be of such size and type to consistently deliver effective dynamic energy suitable to the piles and materials into which they are to be driven. Hammers should operate at manufacturer's recommended speeds and pressures. We recommend that a pile driving hammer be used which is rated at least 19,000 feet pounds. However, driving energy should not be so large that pile damage occurs.

We recommend that minimum spacing of the piles be at least twice the average pile diameter or 1.75 times the diagonal dimension of the pile cross-section. It is recom-

mended that the tops of the piles extend a minimum of 4 inches into the pile cap. Based on the exploration borings no pile shorter than 44 feet is recommended unless proper pile capacity is verified by field inspection by the Geotechnical Engineer. Vertical piles should not vary more than 2% from the plumb position. We further recommend that eccentricity of reaction on a pile group with respect to the load resultant not exceed a dimension that would produce overloads of more than 10% in any one pile.

Since the underlying bedrock is moderately expansive, we recommend a minimum permanent pressure be maintained on each pier. Round pipe piles will require an end uplift pressure of 2500 psf and a side uplift of 600 psf for the portion of the side wall in contact with the expansive formation.

Based on our analyses, a standard 10-3/4inch diameter, 1/4 inch wall, pipe pile driven to refusal may be designed for an allowable capacity of 70 to 90 tons. On this site the capacity of the pile will govern allowable load. Pile driving refusal required to obtain the recommended capacity was taken as 10 blows per inch with a 20 foot kip hammer. Driving hammers should be of such size and type to consistently deliver effective energy suitable to the piles and materials into which they are driven. Final pile driving refusal should be determined by representatives of Lincoln DeVore in the field.

DRIVEN PILE OBSERVATION:

Continuous observation of the pile driving operations and a pile load test, if required, should be performed by Lincoln DeVore as a representative of the owner. A continuous log should be maintained on the number of blows per foot required to drive each pile. Driving should be completed without interruption (except for splicing) and without jetting or pre-drilling unless the geotechnical engineer has been contacted for further recommendations.

REACTIVE SOILS

Since groundwater in the 29 Road and the Grand Junction area in general, typically contains sulfates in quantities detrimental to a Type I cement, a Type II or Type I-II or Type II-V cement is recommended for all concrete which is in contact with the subsurface soils and bedrock. Calcium chloride should not be added to a Type II, Type I-II or Type II-V cement under any circumstances.

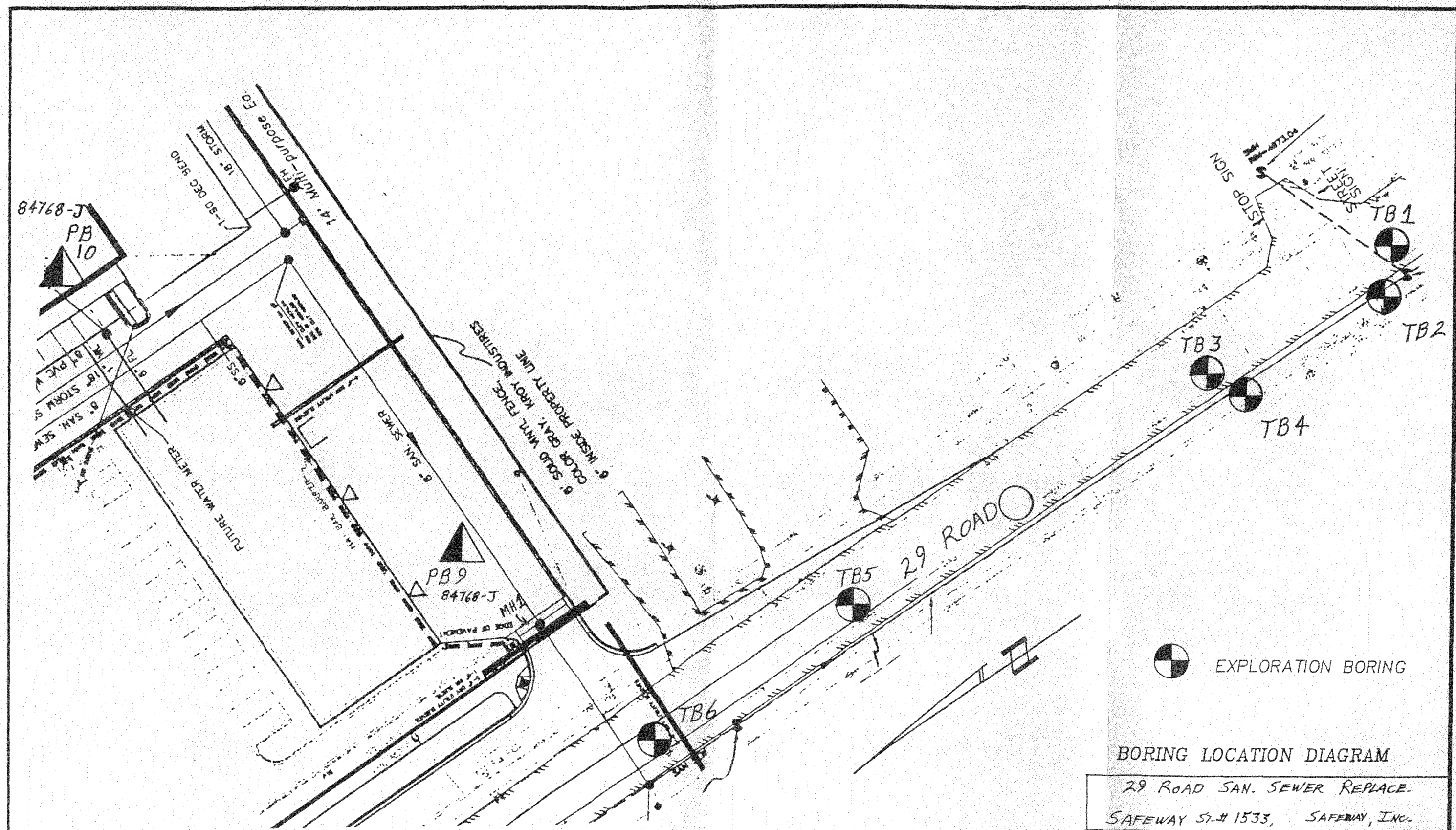
LIMITATIONS

This report is issued with the understanding that it is the responsibility of the owner, or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project, and are incorporated into the plans. In addition, it is his responsibility that the necessary steps are taken to see that the contractor and his sub-contractors carry out these recommendations during construction. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in acceptable or appropriate standards may occur or may result from legislation or the broadening of engineering knowledge. Accordingly, the findings of this report may be invalid, wholly or partially, by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of 3 years.

The recommendations of this report pertain only to the site investigated and are based on the assumption that the soil conditions do not deviate from those described in this report. If any variations or undesirable conditions are encountered during construction or the proposed construction will differ from that planned on the day of this report, Lincoln DeVore should be notified so that supplemental

recommendations can be provided, if appropriate.

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



BORING LOCATION DIAGRAM

29 ROAD SAN. SEWER REPLACE.

SAFEWAY ST.# 1533, SAFEWAY, INC.

LINCOLN DeVORE ENGINEERS · GEOLOGISTS	1441 MOTOR STREET GRAND JCT., COLORADO COLO. SPRINGS–PUEBLO	
	LO # 85669-J	SHEET OF
DRAWN BY:	SCALE: NONE	DATE: 6-17-96
CHECKED BY: E.M. MORRIS	CONT. INT.	REV.

SOILS DESCRIPTIONS:

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

ROCK DESCRIPTIONS:

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

SYMBOLS & NOTES:

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

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

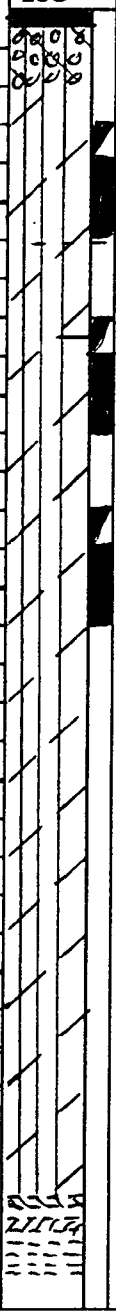
Samples may be bulk, standard split spoon (both disturbed) or 2-1/2" I.D. thin wall ("undisturbed") Shelby tube samples. See log for type.

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

LINCOLN DeVORE INC.

COLORADO SPRINGS
PUEBLO – GRAND JUNCTION

EXPLANATION OF BOREHOLE LOGS AND LOCATION DIAGRAMS



BORING NO. 1

TRAFFIC LANE - 14' EAST and 3' SOUTH OF EXISTING MANHOLE OR104

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION			BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		7" AC - 6" ABC - 12" 'PITRUN'					
		ML-CL SANDY, SILTY CLAY					
				MOIST			
		ML-CL SANDY, SILTY CLAY	SI. FIRM	ST		101.6	11.1%
5		I GRAVELS & SANDS of SILTSTONE & MUDSTONE		5	06/12		
		ML-CL SANDY, SILTY CLAY		SPT	12/24		13.9%
		Top of Capillary Fringe	SOFT				
				WET			
		FREE WATER		ST		94.8	19.9%
10		ML-CL VERY SILTY CLAY SANDY	VERY SOFT	10	01/12		
		II SANDS of SILTSTONE & MUDSTONE		SPT	03/24		24.8%
		ML-CL SANDY, SILTY CLAY	VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE					
		ML-CL VERY SILTY CLAY SANDY	VERY SOFT	ST		95	26.0%
15		II SANDS of SILTSTONE & MUDSTONE		15	01/12		
		ML-CL SANDY, SILTY CLAY	HOLE SQUEEZING	SPT	03/24		26.1%
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE					
20				20			
		ML-CL SANDY, SILTY CLAY	VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE					
		ML-CL VERY SILTY CLAY SANDY	VERY SOFT				
		II SANDS of SILTSTONE & MUDSTONE					
25				25			
		ML-CL SANDY, SILTY CLAY	VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE					
30				30			
		Km **MANCOS SHALE**	Blow Counts are cumulative for each 6 inches of sampler penetration.				
		TD @ 33'	**Free Water @ 8-1/2'**				
			During Drilling 8-23-96				

LOG OF SUBSURFACE EXPLORATION

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

29 Road SANITARY SEWER REPLACEMENT
Grand Junction SAFEWAY STORE # 1533

SAFEWAY, INC. Concepts West Architecture		Date 9-3-96
Job No. 85669-J	Drawn EMM	

BORING NO. 2

WEST SHOULDER - 21' NORTH OF EXISTING MANHOLE OR104

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		4" ABC - 8" 'PITRUN'				
		MAN-MADE FILL/BACKFILL OVER EXISTING SEWER				
		BACKFILL INCLUDES MINOR AMOUNTS OF GRAVEL				
		ML-CL SANDY, SILTY CLAY FIRM	ST		114.2	11.9%
5		I SOME GRAVELS of SILTSTONE & MUDSTONE	5	08/12		
		GM-GC THIN LAYER OF 'PITRUN'	SPT			12.1%
		ML-CL GRAVELLY, SANDY, SILTY CLAY FIRM				
	(?)	I ? SOME GRAVELS OF PIPE BEDDING MATERIAL ?				
10		SEWER PIPE ANTICIPATED AT 8' TO 9'	10			
		TD @ 7'				
15			15			
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each				
		6 inches of sampler penetration.				
		NO Free Water				
		During Drilling 8-23-96				

LOG OF SUBSURFACE EXPLORATION

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

29 Road SANITARY SEWER REPLACEMENT		
Grand Junction SAFEWAY STORE # 1533		
SAFEWAY, INC.		Date
Concepts West Architecture		**9-3-96**
Job No. **85669-J**	Drawn **EMM**	

BORING NO. 3

TRAFFIC LANE - 14' EAST and 95 NORTH OF EXISTING MANHOLE OR104

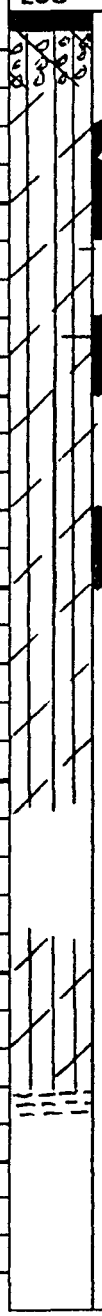
BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		7" AC - 8" ABC - 10" 'PITRUN'				
		ML-CL SANDY, SILTY CLAY SI FIRM	ST		103.2	12.4%
5		I GRAVELS & SANDS of SILTSTONE & MUDSTONE	5	04/12		
			SPT	09/24		16.1%
		Top of Capillary Fringe				
		ML-CL VERY SILTY CLAY SANDY SOFT				
		II SANDS of SILTSTONE & MUDSTONE	ST		89.4	21.7%
10		FREE WATER ▽ VERY SOFT	10	03/12		
			SPT	05/24		26.9%
		ML-CL SANDY, SILTY CLAY VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
		HOLE IS SQUEEZING	SPT	02/12		29.7%
15		SOIL STRATA FROM 1/2" TO 4" THICK	15	04/24		
		ML-CL VERY SILTY CLAY SANDY VERY SOFT				
		II SANDS of SILTSTONE & MUDSTONE				
		ML-CL SANDY, SILTY CLAY VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
20			20			
		NOTE BREAK IN DRILLING LOG				
		20' TO 30'				
30			30			
		Km MANCOS SHALE				
35			35			
		TD @ 35' Blow Counts are cumulative for each				
		6 inches of sampler penetration.				
		Free Water @ 9-1/2'				
		During Drilling 8-23-96				

LOG OF SUBSURFACE EXPLORATION

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

29 Road SANITARY SEWER REPLACEMENT		
Grand Junction SAFEWAY STORE # 1533		
SAFEWAY, INC.		Date
Concepts West Architecture		9-3-96
Job No. 85669-J	Drawn EMM	



DEPTH (FT.)	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
	BORING NO. 5				
	TRAFFIC LANE - 12' EAST and 245' NORTH OF EXISTING MANHOLE OR 104				
	BORING ELEVATION:				
	7" AC - 7" ABC - 12" 'PITRUN'				
	ML-CL SANDY, SILTY CLAY SI FIRM	ST		105.1	16.5%
5	I GRAVELS & SANDS of SILTSTONE & MUDSTONE	5	04/12		
		SPT	08/24		17.9%
	Top of Capillary Fringe				
	ML-CL VERY SILTY CLAY SANDY SOFT				
	FREE WATER ▽	SPT	02/12		27.4%
10	SANDS of SILTSTONE & MUDSTONE	10	04/24		
	SOIL STRATA FROM 1/2" TO 4" THICK				
	ML-CL SANDY, SILTY CLAY VERY SOFT				
	I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
	HOLE IS SQUEEZING	SPT	01/12		25.9%
15		15	02/24		
	ML-CL VERY SILTY CLAY SANDY VERY, VERY SOFT				
	II SANDS of SILTSTONE & MUDSTONE				
	ML-CL SANDY, SILTY CLAY FLOWING SANDS				
	I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
20		20			
	NOTE BREAK IN DRILLING LOG				
	20' TO 35'				
35		35			
	Km MANCOS SHALE				
40		40			
	TD @ 39' Blow Counts are cumulative for each				
	6 inches of sampler penetration.				
	Free Water @ 8-1/2'				
	During Drilling 8-23-96				

LOG OF SUBSURFACE EXPLORATION

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

29 Road SANITARY SEWER REPLACEMENT
Grand Junction SAFEWAY STORE # 1533
SAFEWAY, INC.
Concepts West Architecture
Date **9-3-96**
Job No. **85669-J**
Drawn **EMM**

BORING NO. 6

TRAFFIC LANE - 14' EAST and 380' NORTH OF EXISTING MANHOLE OR104

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		5" AC - 10" ABC - 6" 'PITRUN'				
		ML-CL SANDY, SILTY CLAY SI FIRM	SPT	05/12		17.6%
5		I GRAVELS & SANDS of SILTSTONE & MUDSTONE	5	09/24		
		Top of Capillary Fringe				
		ML-CL VERY SILTY CLAY SANDY SOFT				
		FREE WATER GRAVEL LAYER	ST		117.6	16.5%
10		SANDS of SILTSTONE & MUDSTONE	10	03/12		
		SOIL STRATA FROM 1/2" TO 4" THICK	SPT	05/24		28.5%
		ML-CL SANDY, SILTY CLAY VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
		HOLE IS SQUEEZING	SPT	02/12		26.5%
15			15	04/24		
		ML-CL VERY SILTY CLAY SANDY VERY, VERY SOFT				
		II SANDS of SILTSTONE & MUDSTONE				
		ML-CL SANDY, SILTY CLAY FLOWING SANDS				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
20			20			
		NOTE BREAK IN DRILLING LOG				
		20' TO 35'				
35			35			
		ML-CL SANDY, SILTY CLAY VERY SOFT				
		I GRAVELS & SANDS of SILTSTONE & MUDSTONE				
		HOLE IS SQUEEZING				
40			40			
		Km MANCOS SHALE Blow Counts are cumulative for each 6 inches of sampler penetration.				
		TD @ 43' Free Water @ 8'				
		During Drilling 8-23-96				

LOG OF SUBSURFACE EXPLORATION

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

29 Road SANITARY SEWER REPLACEMENT
Grand Junction SAFEWAY STORE # 1533
SAFEWAY, INC.
Concepts West Architecture

Job No.	Drawn	Date
85669-J	EMM	9-3-96

BORING NO. 9

BORING ELEVATION: 4675'

DEPTH (FT.)	SOIL LOG	DESCRIPTION				BLOW COUNT	SOIL DENSITY pcf	WATER %
		Occ. 'PIPING' FEATURES						
		ML-CL	SANDY, SILTY CLAY		DEBRIS FAN DEPOSITS			
		I	SILTY CLAY		Sl. MOIST			
		ML-CL	SANDY, SILTY CLAY		STRATIFIED	ST	96.4	22.5%
5		II	LOW DENSITY	BROWN	WET	5		
			COMPRESSIBLE		SULFATES			
		FREE WATER ▽			GRAVELS OF SILTSTONE FRAGMENTS			
		ML-CL	SANDY, SILTY CLAY		SOFT TO DRILL			
		I			LOW DENSITY	ST	93.1	24.9%
10		II	SANDY, SILTY CLAY		GRAY-BROWN	10		
			TD @ 9'					
15						15		
20						20		
25						25		
30						30		

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 6-1/2'

During Drilling 1-25-96

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date 1-29-96

Job No. 84768-J

Drawn EMM

BORING NO. 10

BORING ELEVATION: 4673'

DEPTH (FT.)	SOIL LOG	DESCRIPTION			BLOW COUNT	SOIL DENSITY pcf	WATER %
		Occ. 'PIPING' FEATURES	SILTY CLAY SOIL				
		SANDY, CLAY STRATA	SULFATE SALTS				
		DEBRIS FAN DEPOSITS	FIRM Sl. MOIST				
		ML-CL SANDY, SILTY CLAY	STRATIFIED	ST		109.2	15.1%
5		I DECREASING DENSITY	GRAVELLY WET	5	1/6		
		COMPRESSIBLE	SULFATES	SPT	3/12		25.4%
		FREE WATER ▽			5/18		
		LOW DENSITY					
		ML-CL SILTY CLAY		ST		96.3	24.7%
10		II GRAY-BROWN	STRATIFIED	10	1/12		
				SPT	2/18		23.3%
		ML-CL SANDY, VERY SILTY CLAY					
		I SLIGHTLY FIRMER					
		ML-CL SILTY CLAY	Occ SILT STRATA	CS	4/6	99.5	23.5%
15		II INCREASING SAND		15	7/12		
					11/18		
		DEBRIS FAN DEPOSITS					
		DECREASING DENSITY					
		ML-CL SANDY, SILTY CLAY					
20		I COMPRESSIBLE		20			
		VERY EASY TO DRILL	VERY LOW DENSITY				
		ML-CL SILTY CLAY	HOLE IS SQUEEZING SHUT				
		II COMPRESSIBLE					
30		ML-CL GRAVELLY, SANDY, SILTY CLAY		30			
		I COMPRESSIBLE					
		VERY LOW DENSITY					
			VERY GRAVELLY				
		MANCOS SHALE	EXPANSIVE				
35		CL SILTY CLAY	VERY HIGH SULFATES	35	25/6		16.0%
		III MOIST	Blow Counts are cumulative for each	SPT	75/12		
			6 inches of sampler penetration.				
		TD @ 37'	Free Water @ 7'				
			During Drilling 1-16-96				

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

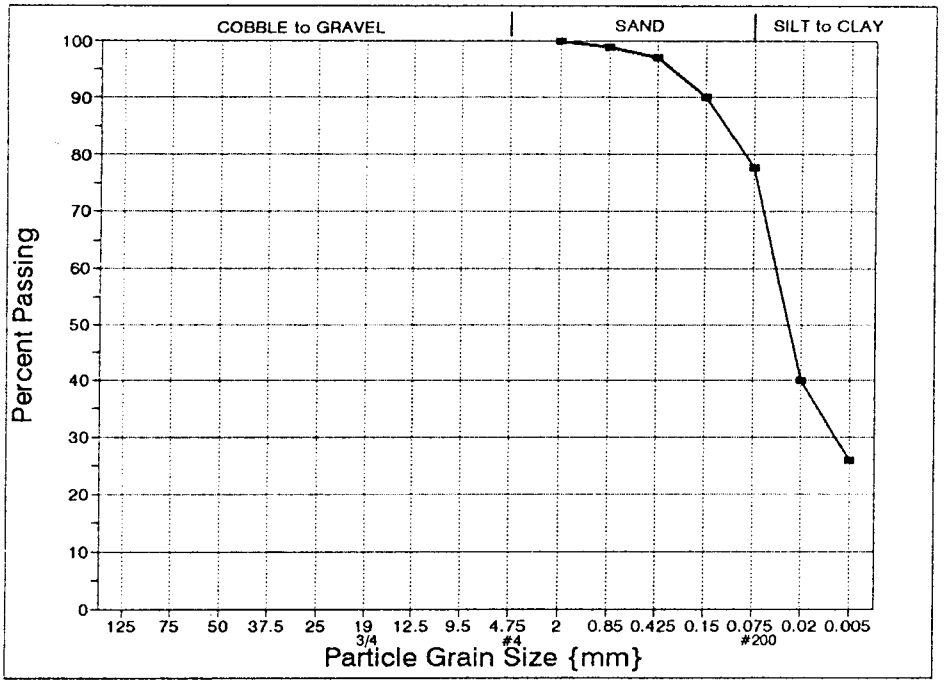
Drawn **EMM**

Soil Sample: **SANDY, VERY SILTY CLAY (ML-CL)** Sample No. **I (Typical)** 1

Job Location **SAFEWAY - 29 & Patterson Road, G.J.** Test by: **LRS**

Natural Water Content (w): **9.4%** Boring No.: **2** Depth: **3'**

Soil Specific Gravity (Gs): **2.66** In-Place Density (pcf): **97.9**



Effective size mm

Cu

Cc

Plastic Limit (PL)	20	%
Liquid Limit (LL)	25	%
Plasticity Index (PI)	5	%
Shrinkage Limit (SL)		%
Shrinkage Ratio		%

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	
3/4"	19	
1/2"	12.5	
3/8"	9.5	
# 4	4.75	
#10	2	100
#20	0.85	99
#40	0.425	97
#100	0.15	90
#200	0.075	77.8
	0.02	40
	0.005	26

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture : %

HVEEM-CARMANY: **FHA Soil Swell:**

'R' Value @ 300 psi: 18 % Swell

Displacement 300 psi: 5.41 psf

Expansion @ 300 psi: 0.3

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 950 psf

Unconfined Compression (qu): psf

CONSOLIDATION: 2.57 % 2042 psf

3.53 % 4069 psf

SULFATE SALTS: 1500 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

Date **1-29-96**

Job No. **84768-J**

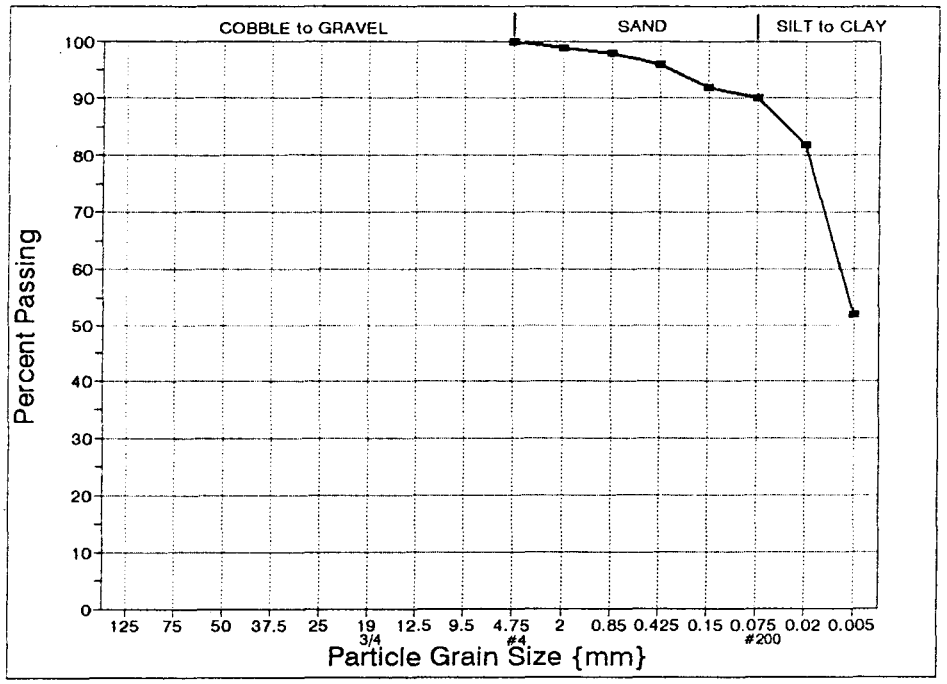
Drawn **EMM**

Soil Sample: **MANCOS SHALE Frm. SILTY CLAY (CL)** Sample No. **III (Typical)** 3

Job Location **SAFEWAY - 29 & Patterson Road, G.J.** Test by: **LRS**

Natural Water Content (w): **13.9%** Boring No.: **3** Depth: **22'**

Soil Specific Gravity (Gs): **2.66** In-Place Density (pcf):



Effective size mm

Cu

Cc

Plastic Limit (PL) 31 %

Liquid Limit (LL) 43 %

Plasticity Index (PI) 12 %

Shrinkage Limit (SL) %

Shrinkage Ratio %

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	
3/4"	19	
1/2"	12.5	
3/8"	9.5	
# 4	4.75	100
#10	2	99
#20	0.85	98
#40	0.425	96
#100	0.15	92
#200	0.075	90.2
	0.02	82
	0.005	52

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture : %

HVEEM-CARMANY: **FHA Soil Swell:**

'R' Value @ 300 psi: % Swell

Displacement 300 psi: psf

Expansion @ 300 psi:

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 7000 psf

Unconfined Compression (qu): psf

CONSOLIDATION: % psf

% psf

SULFATE SALTS: 2000 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

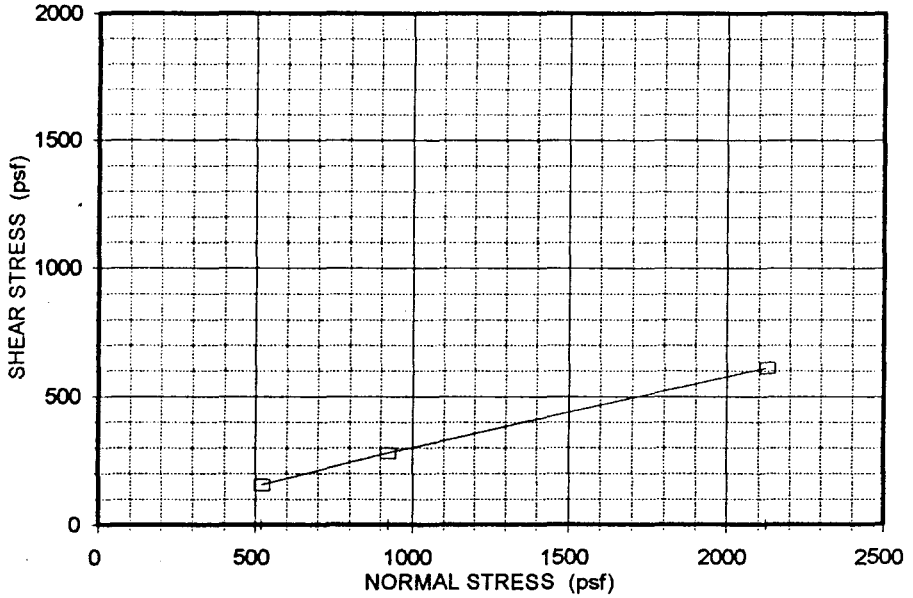
S.E. Corner, 29 & PATTERSON Roads
GRAND JUNCTION, COLORADO

SAFEWAY, INC.
ENGLEWOOD, COLORADO

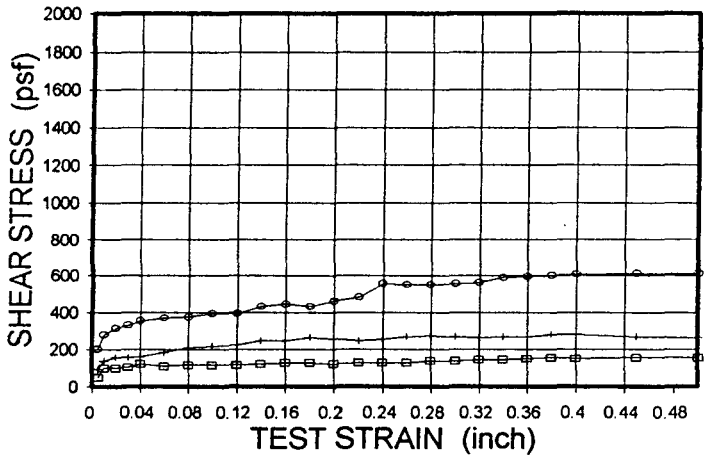
Date **1-29-96**

Job No. **84768-J**

Drawn **EMM**



Trial #	Normal Load	Ult. Load	Resid. Load	Void Ratio	Initial Density	Initial H2O	Final Density	Final H2O	Sat. %
1	520	157	0	0.638	101.4	27.0	101.4	23.3	97%
2	923	281	0	0.638	101.4	27.0	101.4	22.0	92%
3	2126	613	0	0.630	101.9	27.0	101.9	20.1	85%



SOIL TYPE ML-CL # I

TEST SUMMARY

CONSOLIDATED, DRAINED - (CD)
REMOLDED SPECIMENS

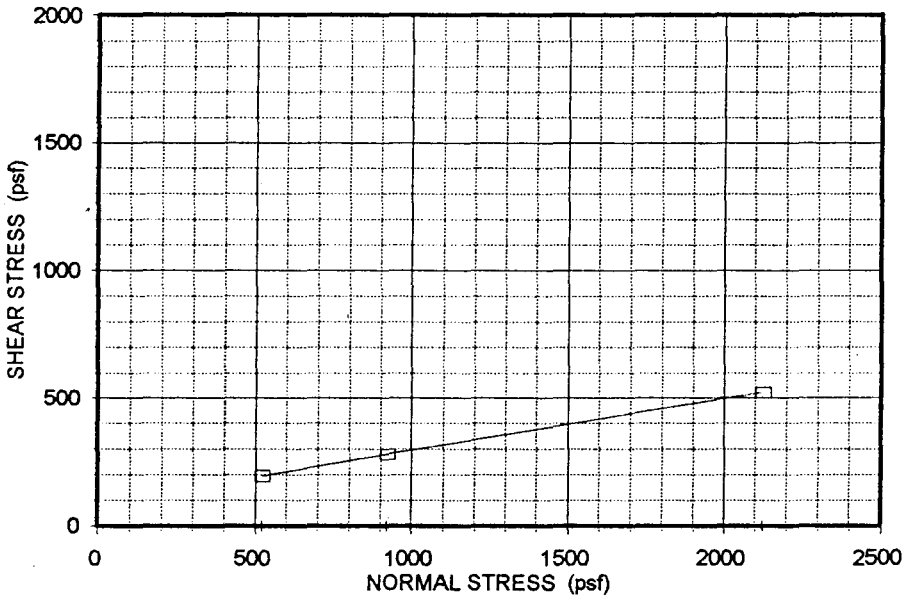
	PEAK	RESID.
PHI Angle (deg.):	15.8	0.0
Tan. of PHI Angle:	0.282	0.000
Cohesion (psf) Apparent	15	0

DIRECT SHEAR TEST, ASTM D-3080

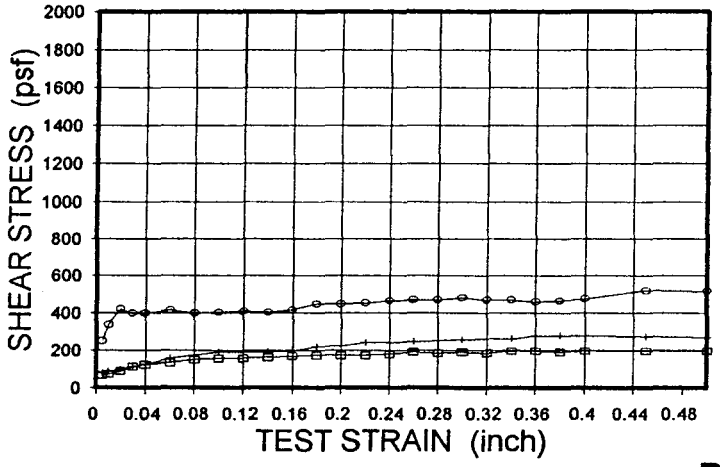
LINCOLN - DeVORE, Inc.
Geotechnical Consultants
Grand Junction, Colorado

29 Road Sanitary Sewer Extension
Grand Junction SAFEWAY # 1533

SAFEWAY, INC. Concepts West Arch.		Date 8-26-96
Job No. 85669-J	Sample ML-CL I	Tech. RL



Trial #	Normal Load	Ult. Load	Resid. Load	Void Ratio	Initial Density	Initial H2O	Final Density	Final H2O	Sat. %
1	520	197	0	0.536	107.7	22.1	107.7	19.1	95%
2	923	281	0	0.529	108.1	22.1	108.1	18.8	94%
3	2126	523	0	0.511	109.5	22.1	109.5	20.4	106%



SOIL TYPE ML-CL # II

TEST SUMMARY

CONSOLIDATED, DRAINED - (CD)

REMOLDED SPECIMENS

	PEAK	RESID.
PHI Angle (deg.):	11.5	0.0
Tan. of PHI Angle:	0.203	0.000
Cohesion (psf) Apparent	93	0

DIRECT SHEAR TEST, ASTM D-3080

LINCOLN - DeVORE, Inc.

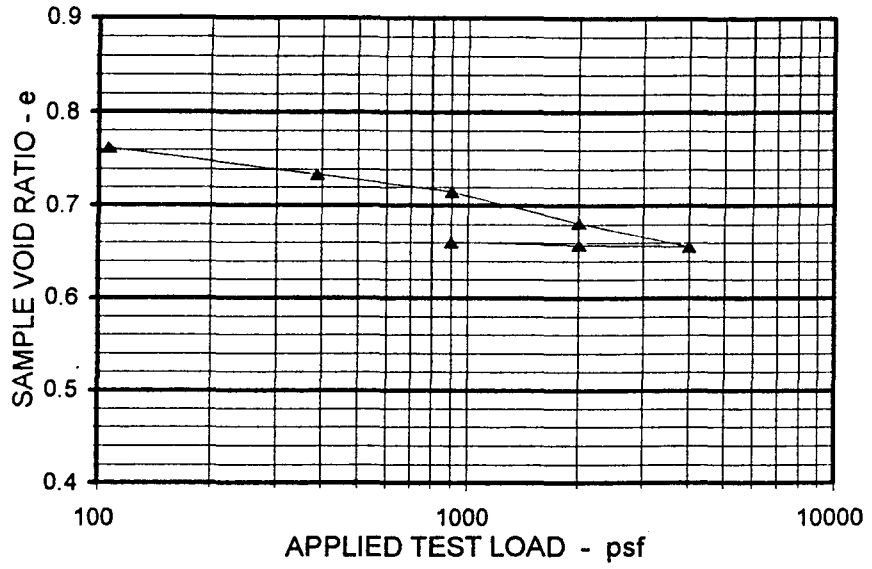
Geotechnical Consultants

Grand Junction, Colorado

29 Road Sanitary Sewer Extension

Grand Junction SAFEWAY # 1533

SAFEWAY, INC. Concepts West Arch.		Date 8-26-96
Job No. 85669-J	Sample ML-CL II	Tech. RL



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

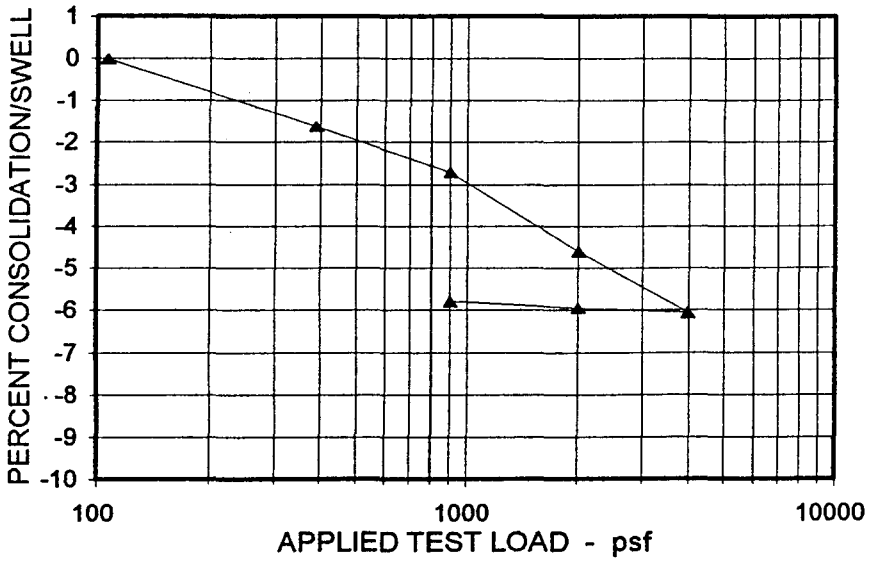
The 'Seating' Load Is To Remove Slack From The Apparatus And To Provide An Accurate Point of Beginning.

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

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

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

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



LOAD SUMMARY

106	*psf SEATING LOAD*
2007	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.26	*% SAMPLE REBOUND @ UNLOAD*
6.05	*% MAXIMUM CONSOLIDATION*
3990	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	94.2	100.2	100.0
SOIL MOISTURE (%)	28.7%	24.7%	24.7%
CONSOLIDATION (%)	-0-	6.05%	5.79%
VOID RATIO (e)	0.763	0.656	0.661
SATURATION (%)	100%	100%	100%

SOIL #:	I
SOIL TYPE:	ML-CL
TEST HOLE #:	1 @ 13'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

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

29 Road SANITARY SEWER REPLACEMENT
Grand Junction SAFEWAY STORE # 1533
SAFEWAY, INC.
Concepts West Architecture
Date **9-3-96**
Job No. **85669-J**
Drawn **EMM**

APPENDIX "E"

MEMORANDUM OF GROUND LEASE

1533 Legal

PAGE DOCUMENT

BOOK2239 PAGE503

1759993 0409PM 06/10/96
MONIKA TODD CLK&REC MESA COUNTY CO

RECORD & RETURN TO:

Safeway Inc.
Real Estate Law Division
P. O. Box 660
Oakland, CA 94660

MEMORANDUM OF GROUND LEASE

This Memorandum of Ground Lease ("Memorandum") is made this 31st day of May, 1996 by and between WALTER K. WAYMEYER, an individual, as Landlord, and SAFEWAY INC., a Delaware corporation, as Tenant, on the following terms and conditions:

1. **Date of Ground Lease:** February 2, 1996.

2. **Description of the real property comprising the ground leased premises:** See Exhibit A attached to and made a part of this Memorandum (the "leased premises").

3. **Date of Original Term Commencement:** June 7, 1996.

4. **Date of Original Term Expiration:** June 6, 2016.

5. **Options to Extend Original Term:** Tenant is granted the right to extend the Original Term of the Ground Lease for ten (10) separate, consecutive and additional extension terms of five (5) years each.

6. **Construction and Alteration of Building Improvements:** Tenant may, at Tenant's expense, raze any improvements on the leased premises and construct on the leased premises any improvements, including without limitation, store buildings and parking areas, and made such repairs, additions, alterations and improvements as Tenant may deem desirable.

7. **Tenant's Right of First Refusal.** If Landlord determines to sell all or any part of the leased premises and receives a bona fide offer, Landlord before making any agreement to sell, will give notice to Tenant stating Landlord's desire to sell and the amount of such offer. Tenant shall have the exclusive right for sixty (60) days after receiving such notice to purchase the premises to which such offer refers at the amount of said offer, or for any lesser amount which Landlord may be willing to accept. If Tenant fails to exercise the said right and the leased premises are sold by Landlord to a third party, such sale shall nevertheless be made subject to the Ground Lease, including this Section, and said right shall be applicable to any and all subsequent offers to purchase received by Landlord's successors and assigns. Notwithstanding the foregoing, Landlord may assign Landlord's interest in this Ground Lease, in whole or in part, to 23rd North Junction Investments

Limited, a limited partnership, at Landlord's discretion, without triggering Tenant's right of first refusal granted in this Section.

8. **Ratification.** This instrument is a memorandum of the aforesaid Ground Lease and is subject to all of the terms and conditions of the Ground Lease. In the event of any inconsistency between the terms of this instrument and the Ground Lease, the terms of the Ground Lease shall control as between Landlord and Tenant.

IN WITNESS WHEREOF, Landlord and Tenant have executed this Memorandum of Ground Lease as of the date first written above.

LANDLORD:

WALTER K. WAYMEYER
an individual

Walter K. Waymeyer

TENANT:

SAFEWAY INC.
a Delaware corporation

By: Linda S. McDonald
Its Assistant Vice President

By:
Its Assistant Secretary

ACKNOWLEDGMENTS ON THE FOLLOWING PAGE

ACKNOWLEDGMENT

STATE OF CALIFORNIA)
) ss.
COUNTY OF Butte)

On 6/3, 1996, before me, Julie A. Cooke, Notary Public, personally appeared Walter K. Waymeyer, personally known to me, or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument, the person or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature Julie A. Cooke (Seal)

JULIE A. COOKE
Comm. #1085837
NOTARY PUBLIC CALIFORNIA
BUTTE COUNTY
Comm. Exp. Feb. 1, 2000

ACKNOWLEDGMENT

STATE OF CALIFORNIA)
) ss.
COUNTY OF ALAMEDA)

On May 31, 1996 before me, Gloria L. Woo, Notary Public, personally appeared Linda S. MacDonald and Jerome P. Harrison, personally known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same in their authorized capacities, and that by their signatures on the instrument, the persons or the entity upon behalf of which the persons acted, executed the instrument.

WITNESS my hand and official seal.

Signature Gloria L. Woo (Seal)

GLORIA L. WOO
COMM. #1072965
NOTARY PUBLIC-CALIFORNIA
COUNTY OF ALAMEDA
My Comm. Expires Sept. 17, 1999

LEGAL DESCRIPTION

A parcel of land located in the City of Grand Junction, County of Mesa, State of Colorado, more particularly described as follows:

Parcel 1: 2943-082-00-010;

NW 1/4 NW 1/4 NW 1/4 Section 8, Township 1 South, Range 1 East, Ute Meridian, LESS drain and Excluding South 125 feet of West 330 feet and Excluding ROW described in Book 1279 Page 571 and Book 1376, Page 610-611 and Book 2077, Page 517-518.

Parcel 2: 2943-082-00-011;

Beginning at SW corner of NW 1/4 NW 1/4 NW 1/4 Section 8, Township 1 South, Range 1 East, Ute Meridian, North 125 feet, East 330 feet, South 125 feet, West to Beginning.

Parcel 3: 2943-082-00-039;

Beginning at NW corner NE 1/4 NW 1/4 NW 1/4 Section 8, Township 1 South, Range 1 East, Ute Meridian, South 0 03' East 659.89 feet, East 132.03 feet, North 0 03' West 659.89 feet, West 132.03 feet to Beginning, excluding the Right-of-Way described in Book 1376, Page 610-611.

EXHIBIT A

APPENDIX "F"

LIFT STATION MAINTENANCE AGREEMENT

LIFT STATION AGREEMENT

THIS LIFT STATION AGREEMENT is made this 17th day of October, 1996 by and between the **CITY OF GRAND JUNCTION**, a municipal corporation of the State of Colorado ("City") and **SAFEWAY STORES 46, INC.**, a Delaware corporation ("Safeway").

RECITALS

A. Safeway desires to construct a sanitary sewer lift station (the "lift station") upon the shopping center development located at the southeast corner of 29 and F Roads in Grand Junction, Mesa County, Colorado (the "shopping center"). The lift station will be constructed in the location identified as 588-3/4 29 Road on the Plat attached to and made a part of this Agreement as Exhibit A. The purpose of the lift station is to provide access from the shopping center to the sanitary sewer lines lying in the public right-of-way along 29 Road.

B. The Fruitvale Sanitation District ("FSD") has constructed sanitary sewer lines in the public right-of-way along 29 Road in Grand Junction, Colorado. The existing sanitary sewer lines in 29 Road are sized for removal of the effluent from the shopping center. The FSD has permitted Safeway to connect the shopping center to the FSD's sanitary sewer lines via the lift station, provided that maintenance of the lift station is performed by the City of Grand Junction. Upon completion of the lift station, Safeway desires that the City of Grand Junction Waste Water Department maintain the lift station in accordance with the provisions of this Agreement.

AGREEMENT

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and Safeway agree as follows:

TERMS

1. Plans and Specifications. Safeway agrees to prepare any and all plans and specifications for the design and construction of the lift station. The plans and specifications shall be subject to the written approval of the City and FSD.

2. Permits. Safeway agrees to obtain any and all permits required to construct the lift station. Safeway will construct the lift station in accordance with the plans and specifications and all applicable laws, rules, regulations and ordinances.

3. Inspections. During construction of the lift station, Safeway agrees to pay the expenses of a construction inspector, to be selected by the City, who will be on the construction site during the construction of the lift station. The construction inspector

shall act as agent for the City during construction of the lift station. Provided the lift station is constructed in accordance with the City-approved plans and specifications, upon its completion the City will accept the lift station for maintenance in accordance with and pursuant to the maintenance agreement between FSD and the City.

4. Maintenance. The City agrees to provide all normal and reasonable operation and maintenance service to the lift station, subject to the provisions set forth in this Section 4:

4.1. The City will provide emergency call-out service for sewage blockage at a rate of $108.00 per hour during normal operating hours (8 AM to 5 PM, Monday through Friday) and $162.00 per hour for overtime, weekends and holidays. An authorized representative from the District must authorize all call-outs. The District will identify in writing, from time to time, those persons who are so authorized. The minimum monthly charge for emergency call-out service is $100.00 per month. Any call-out charge will be applied against the monthly minimum.

4.2. Safeway shall pay for lift station and associated system maintenance at a rate of $420.00 per month. Maintenance services shall include all routine operation and maintenance and routine repairs. Any cost for any part or piece of equipment which exceeds $100.00 will be furnished or paid for separately by Safeway.

4.3. The City may charge prevailing rates for maintenance services and in addition thereto may amend the rates set forth in subsections 4.1 and 4.2 above by giving notice to Safeway on or before September 30 of each year beginning in 1997 for the subsequent year. If written notification is not provided to Safeway by September 30, then the rate schedule will continue for the following calendar year.

5. Capital Improvements. Any work, repair or replacement required to be made to the lift station shall be at Safeway's sole expense. If the City makes the repair or replacement, the City will bill Safeway for labor and materials plus 20% overhead, however, Safeway reserves the right to contract with a third party for any specific repair and replacement required or directed by the City.

6. Permitted Discharge. It is agreed that the City shall be responsible for policing Safeway relative to sewage materials or matters discharged into the sewage system; no oil, acid, or other matters that may be detrimental to the treatment process employed in the City's sewage treatment plant, nor storm drains or allowable ground waters shall be permitted to be discharged into the City's sanitary sewer line or lines, nor shall irrigation or drainage ditches be permitted to discharge into the City's lines. If any discharge is discovered in the line or lines contrary to the limitations provided in this paragraph, upon proper notice from the City, Safeway agrees to do whatever is necessary to rectify the situation immediately.

7. Ownership. The lift station as constructed, including rights of way and easements required, shall remain the sole and separate property of Safeway, subject to a

perpetual right of access and entry for maintenance of the lift station by the City and/or FSD.

8. Notices. Notices made by the parties under this Agreement may be served personally or may be served by depositing the same in the United States mail, postage prepaid, certified mail or nationally recognized overnight courier service addressed as follows:

If to the City:	City of Grand Junction 250 N. 5th Street Grand Junction, CO 81507 Attn: Utility Engineer
If to Safeway:	Safeway Stores 46, Inc. 5918 Stoneridge Mall Road Pleasanton, CA 94588 Attn: Vice President, Real Estate Law (510) 467-3000
With a copy to:	Safeway Inc. 6900 S. Yosemite Street Englewood, CO 80112-1412 Attn: Construction Director (303) 843-7600

9. Waiver of Default. A waiver of default by either party in the terms of conditions of this Agreement shall not operate as a waiver of any subsequent default.

10. Headings. The City and Safeway agree that the headings contained in this Agreement are inserted for convenience of reference only and in no way define, limit or describe the scope or intent of this Agreement.

11. Entire Agreement. It is agreed between the parties that once this Agreement is fully executed and delivered that it contains the entire agreement between the City and Safeway, and that, in executing it, the parties do not rely on any statement, promise, or representation not expressed in this Agreement and this Agreement once executed and delivered shall not be modified, changed or altered in any respect except by a writing executed and delivered in the same manner as required for this Agreement.

12. No Joint Venture. It is not intended by this Agreement to, and nothing contained in this Agreement will, create any partnership, joint venture or other joint or equity type agreement between the City and Safeway. No term or provision of this Agreement is intended to be, or will be, for the benefit of any person, firm, organization, or corporation not a party to this Agreement, and no such other person, firm, organization or corporation will have any right or cause of action under this Agreement.

13. Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the City and Safeway and their respective successors and assigns.

THIS LIFT STATION AGREEMENT is executed as of the day and year first written above.

CITY OF GRAND JUNCTION
a municipal corporation

By:_____
Its

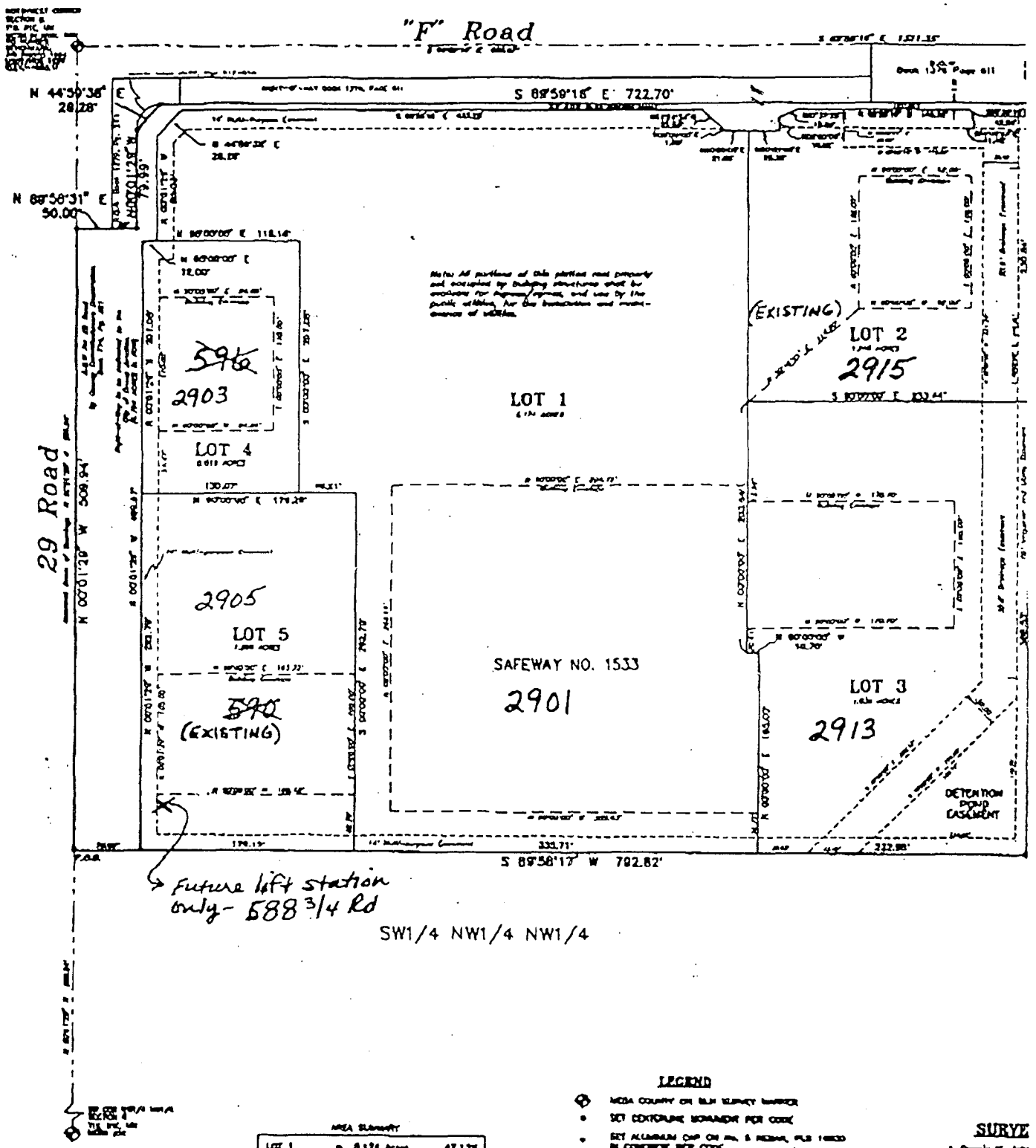
By:_____
Its

SAFEWAY STORES 46, INC.
a Delaware corporation

By: Linda S McDonald
Its Assistant Vice President

By:_____
Its Assistant Secretary

SAFEWAY COTTONWOOI



REVISED BY CITY PLANNING

COLORADO DEPARTMENT OF HEALTH
Water Quality Control Division
4210 East 11th Avenue
Denver, Colorado 80220

APPLICATION FOR SITE APPROVAL FOR CONSTRUCTION OR EXPANSION OF:

A) DOMESTIC WASTEWATER TREATMENT WORKS (INCLUDING TREATMENT PLANTS, OUTFALL SEWERS, AND LIFT STATIONS) OVER 2,000 GPD CAPACITY.

B) INTERCEPTORS (IF REQUIRED BY C.R.S. 25-8-702 (3))

APPLICANT: Safeway, Inc.
ADDRESS: 6900 S. Yosemite, Englewood, CO 80112-1412 PHONE: 303/843-7600
Consulting Engineer's Name and Address: LANDesign, LLC, 259 Grand Avenue
Grand Junction, CO 81501 PHONE: 970/245-4099

A. Summary of information regarding new sewage treatment plant:

1. Proposed Location: (Legal Description) NW 1/4, NW 1/4, Section 8
Township 1S, Range 1E,
Mesa County.

2. Type and capacity of treatment facility proposed: Processes Used Lift Station

Hydraulic 19,797 gal/day Organic 737.5 lbs. BOD_5/day

Present PE N/A Design PE 188.5 % Domestic N/A % Industrial 100

3. Location of facility:
Attach a map of the area which includes the following:
(a) 5-mile radius: all sewage treatment plants, lift stations, and domestic water supply intakes.
(b) 1-mile radius: habitable buildings, location of potable water wells, and an approximate indication of the topography.

4. Effluent disposal: Surface discharge to watercourse N/A
Subsurface disposal N/A Land N/A
Evaporation N/A Other N/A
State water quality classification of receiving watercourse(s) N/A
Proposed Effluent Limitations developed in conjunction with Planning and Standards Section, WQCD: BOD_5 30 mg/l SS 30 mg/l Fecal Coliform 7000 /100 ml
Total Residual Chlorine 0.135 mg/l Ammonia N/A mg/l Other N/A

5. Will a State or Federal grant be sought to finance any portion of this project?

6. Present zoning of site area? PB
Zoning with a 1-mile radius of site? PB, R2, PUD, PR3, PR3.1, PR8.4, PR17 PZ, RSF-2, RSF-4, RSF-5

7. What is the distance downstream from the discharge to the nearest domestic water supply intake? N/A No discharge
(Name of Supply)

(Address of Supply)

What is the distance downstream from the discharge to the nearest other point of diversion? N/A No discharge
(Name of User)

(Address of User)

8. Who has the responsibility for operating the proposed facility? The City of Grand Junction by Maintenance Agreement.

9. Who owns the land upon which the facility will be constructed? Walter Waymeyer, 5430 Sawmill Road, #18, Paradise, CA 95969
(Please attach copies of the document creating authority in the applicant to construct the proposed facility at this site.)

10. Estimated project cost: $40,000.00
Who is financially responsible for the construction and operation of the facility? (Safeway, Inc., Construction), (City of Grand Junction, Operation)

11. Names and addresses of all water and/or sanitation districts within 5 miles downstream of proposed wastewater treatment facility site. See Appendix "A" of the report.
(Attach a separate sheet of paper if necessary.)

12. Is the facility in a 100 year flood plain or other natural hazard area? No
If so, what precautions are being taken? N/A

Has the flood plain been designated by the Colorado Water Conservation Board, Department of Natural Resources or other Agency? FEMA
(Agency Name)
If so, what is that designation? Zone X, See Appendix "A" of report.

13. Please include all additional factors that might help the Water Quality Control Division make an informed decision on your application for site approval.
See attached report.

B. Information regarding lift stations:

1. The proposed lift station when fully developed will generate the following additional load: Peak Hydraulic (MGD) 19,797 Gal/Day P.E. to be served 188.5

2. Is the site located in a 100 year flood plain? No
If yes, on a separate sheet of paper describe the protective measures to be taken.

3. Describe emergency system in case of station and/or power failure.
See attached report

4. Name and address of facility providing treatment: Persigo Wastewater Plant, 2145 River Road, Grand Junction, CO 81501

5. The proposed lift station when fully developed will increase the loading of the treatment plant to 68.16% of hydraulic and 50 % of organic capacity and City of Grand Junction agrees to treat this wastewater? Yes X No
(Treatment Agency)

Date

Signature and Title
Gregory O. Trainor, Utility Manager

ATTACHMENT TO SITE APPLICATION

In accordance with C.R.S. 1981, 25-8-702 (2)(a), (b), and (c), and the "Regulations for Site Applications for Domestic Wastewater Treatment Works", the Water Quality Control Division mus determine that each site location is consistent with the longrange, comprehensive planning fo the area in which it is to be located, that the plant on the proposed site will be managed to minimize the potential adverse impacts on water quality, and must encourage the consolidation of wastewater treatment works whenever feasible.

In making this determination, the Division requires each applicant for a site approval for a domestic wastewater treatment works to supply an engineering report describing the project an showing the applicant's capabilities to manage and operate the faility over the life of the project to determine the potential adverse impacts on water quality. The report shall be considered the culmination of the planning process and as a minimum shall address the following:

Service area definition including existing population and population projections, flow/loading projections, and relationship to other water and wastewater treatment plants in the area.

Proposed effluent limitations as developed in coordination with the Planning and Standards Section of the Division. (Allow minimum four weeks processing time.)

Analysis of existing facilities including performance of those facilities.

Analysis of treatment alternatives considered.

Flood plain and natural hazard analysis.

Detailed description of selected alternatives including legal description of the site, treatment system description, design capacities, and operational staffing needs.

Legal arrangements showing control of site for the project life.

Institutional arrangements such as contract and/or covenant terms for all users which will be finalized to accomplished acceptable waste treatment.

Management capabilities for controlling the wastewater throughout and treatment within the capacity limitations of the proposed treatment works, i.e., user contracts, operating agreements, pretreatment requirements.

Financial system which has been developed to provide for necessary capital and continued operation, maintenance, and replacement through the life of the project. This would include, for example, anticipated fee structure.

Implementation plan and schedule including estimated construction time and estimated start-up date.

Depending on the proposed project, some of the above items may not be applicable to address. In such cases, simply indicate on the application form the non applicability of those.

C. If the facility will be located on or adjacent to a site that is owned or managed by a Federal or State agency, send the agency a copy of this application.

D. Recommendation of governmental authorities:

Please address the following issues in your recommendation decision. Are the proposed facilities consistent with the comprehensive plan and any other plans for the area, including the 201 Facility Plan or 208 Water Quality Management Plan, as they affect water quality? If you have any further comments or questions, please call 320-8333, Extension 5272.

	Date	Recommend Approval	Recommend Disapproval	No Comment	Signature of Representative
					Mark Achen, City Manager
1.					Management Agency
2.					Linda Afman Local Government: Cities or Towns (If site is inside boundary or within three miles) and Sanitation Districts.
3.					Board of County Commissioners Doralyn Genova
4.					Local Health Authority Steve Defeyter
5.					City/County Planning Authority Joe Crocker
6.					N/A Council of Governments/Regional Planning
7.					N/A State Geologist

(For lift stations, the signature of the State Geologist is not required. Applications for treatment plants require all signatures.)

I certify that I am familiar with the requirements of the "Regulations for Site Applications For Domestic Wastewater Treatment Works," and have posted the site in accordance with the regulations. An engineering report, as described by the regulations, has been prepared and is enclosed.

DATE October 2, 1996 Robert B. Henry

Signature of Applicant TYPED NAME

Bob Henry, V.P. Marketing Operations

LANDesign
ENGINEERING • SURVEYING • PLANNING

October 23, 1996

RECEIVED
OCT 25 1996

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

Attn: Ms. Jody Kliska, Development Engineer

Dear Jody:

Please find attached a copy of an "Application For Site Approval For Construction Or Expansion Of" a sanitary sewer Lift Station and a "Sewer Lift Station Design Report" for the Safeway Store #1533 located at 29 and F Road.

The Safeway project was approved for construction by the City of Grand Junction on 07/16/96. It should be noted that a sanitary sewer Lift Station was not planned for in the original design. The need to construct a Lift Station in lieu of a gravity sanitary sewer system to serve the project became apparent as construction proceeded due to site constraints as detailed in the "Sewer Lift Station Design Report."

We respectfully request your immediate attention to the review of this application in that the Colorado Department of Health's approval is critical to the completion of site construction and the target date for the building completion of January 12, 1997.

Upon approval by your office we will submit the original of the application and supporting design information to the State of Colorado for review and approval.

If there is anything our office can do to aid you in your review or you have any questions, please contact Phil Hart or Monty Stroup at (970) 245-4099.

Respectfully,

Philip M. Hart

Philip M. Hart, P.E.
President

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

SPR-1996-107

James A. Weber
Donald G. LeBrasse

December 18, 1996

Mr. Michael Drollinger
City of Grand Junction
Community Development Department
250 North 5th Street
Grand Junction, CO 81501

Re: **Safeway Store No. 1533**
29 Road and F Road
Grand Junction, CO
Job No. 9529A

Dear Michael:

Per our meeting of last fall, we are requesting administrative approval on some minor revisions to the development plan.

The requested revisions relate to the building footprint and adjacent parking for Retail Building B, Pad No. 2. The building footprint configuration changes, but the building area remains at 9,000 sf. The number of parking stalls surrounding the building changes from 56 stalis to 51 stalls. The total parking for the site went from 502 stalls to 497 stalls, while the required parking would remain at 405 stalls.

Enclosed with this letter are two sets of the site development drawings, which indicate the revised Retail Building B, Pad No. 2 site. These drawing are:

Sheet 2 - Site Plan

Sheet 4 - Landscape Plan [overall layout Phase II].

Sheet 8 - Landscape Plan [south and west]

Sheet 18 - Interior curb, gutter and paving plan

Sheet 26 - Utility Composite Plan

Please review these documents and advise this office what other action is necessary in obtaining approval of the changes to Retail Building B, Pad No. 2.

If you have any questions, please contact this office.

Sincerely,

Gary M. Harrison, NCARB
Project Manager

Enclosure

cc: Cam Potter (Safeway) letter
Brian Hannig (Safeway) letter
Monty Stroup (LANDesign) 1 set
Mark Gibbons (Landscape Specialties) 1 set

mh
\9529\W1064

CONCEPTS WEST ARCHITECTURE, INC. • ARCHITECTS AND PLANNERS
202 East Cheyenne Mountain Blvd., Suite Q • Colorado Springs, CO 80906
(719) 576-1555 (719) 576-1631 - Fax

January 20, 1997

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

Monty Stroup
Landesign
259 Grand Avenue
Grand Junction, CO 81501

RE: Safeway

Dear Mr Stroup:

After reviewing the drawings of the power pole locations at the east entrance and visiting the site, I have determined the following two options for the sidewalk to be acceptable:

1. Safeway may dedicate additional right of way so the 6' walk is located between the two sets of guy wires and poles in the approximate location of the concrete blankets on the ground. With this option, no poles or guys are located within the concrete walk. Any landscaping which is displaced by this option must be replaced in kind and approved by the City Community Development Department. The alignment of the sidewalk from the center driveway to the east driveway will be a straight line.

2. The power poles and guys may be relocated so the sidewalk is constructed according to the approved plans.

Please notify me of the selected option prior to the placement of concrete.

I have reviewed the pavement information submitted by Lincoln-DeVore regarding the 29 Road existing bike path. It appears from this report additional pavment thickness is required prior to the permanent striping being placed as per the approved plans. Please notify me of how construction of this additional pavement thickness will proceed. From a practical standpoint of construction practices, it appears the existing path will need to be milled and replaced to achieve the desired section.

The temporary striping plan is approved and should be implemented as soon as possible.

Please contact me with any questions you may have.

Sincerely,

Jody Kliska, P.E.
City Development Engineer

cc: Gary Harrison, Concepts West
Don Newton, City Engineer
Michael Drollinger, City Community Development
Curt Holland, Francis Constructors

Punch List

Date: January 28, 1997

Project: SAFEWAY COTTONWOOD CENTRE

By: Monty Stroup

The following is a list of items to be corrected or completed based on a site inspection on 01/28/97.

Public Improvements 29 Road

1. Install striping (temporary/permanent).

2. Install CDOT Standard Delineators (Type 1), 6 Locations along asphalt taper.

3. Install 1 - Traffic Control Sign (R3-9b), west ROW.

4. Replace broken curb and gutter of north curb return at truck access.

Public Improvements F Road

1. Install 1 - Traffic Control Combination Sign (R3-2 and R4-7A) in median island of main entrance to site.

2. Install 2 - Traffic Control Signs (R5-1 and a combination R3-2 & R4-7A) in median island of in tuck exit from site.

3. Install revised sidewalk and handi-cap ramps between the main access and truck exit (1,017 SF).

Private Site Improvements

1. Revise parking striping in front of Retail Pad A per City comments to be (reverse).

2. Install 1 - Traffic Control Sign (R1-1) at north curb return of truck entrance from 29 Road.

3. Install 1 - Traffic Control Sign (R1-1) at northeast corner of Safeway Building.

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4. Remove the (R3-7) sign at the truck exit to F Road and replace with a (R3-5).

5. Install the following;

Ashalt	4,469	SY
Colored Concrete X-pan	224	SF
Concrete V-pan	142	SF
18-inch curb & gutter	56	LF
LP and fixture @ 29 Rd.	1	EA

6. Install site Landscaping.

cc: Jody Kliska
Michael Drollinger
Brian Hannig
Gary Harrison

LANDesign
ENGINEERING • SURVEYING • PLANNING

LETTER OF TRANSMITTAL

February 13, 1997

City of Grand Junction: Michael Drollinger
Safeway Inc.: Mr. Cam Potter

Re: Safeway 1533, Developer Improvements Agreement.

Transmitted By: Delivery

Please find attached a 1 copy of the Quote from Francis Constructors Inc. for the total cost for items to be completed and 1 copy of the new Development Improvements Agreement. Submitted for your review and approval.

Sincerely

Monty D. Stroup
Project Manager

file:lot30

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LANDesign
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LETTER OF TRANSMITTAL

February 18, 1997

City of Grand Junction: Jody Kliska & Michael Drollinger.

Re: Safeway 1533, Retail Pad "A" Striping Revisions.

Transmitted By: Delivery

Please find attached 2 exhibits showing the location of a proposed asphalt Handi-cap Ramp in front of Retail Pad "A". The ramp is to be located between the two HC spaces as shown on the exhibits. This alternative provides additional safety for wheel chair traffic in that it routes the traffic directly onto the sidewalk for Retail "A" and not into the travel lanes behind parked vehicles. Please review this proposed location and the contractor will be advised to install it as soon as possible.

Sincerely

Monty D. Stroup
Project Manager

file:
lot34

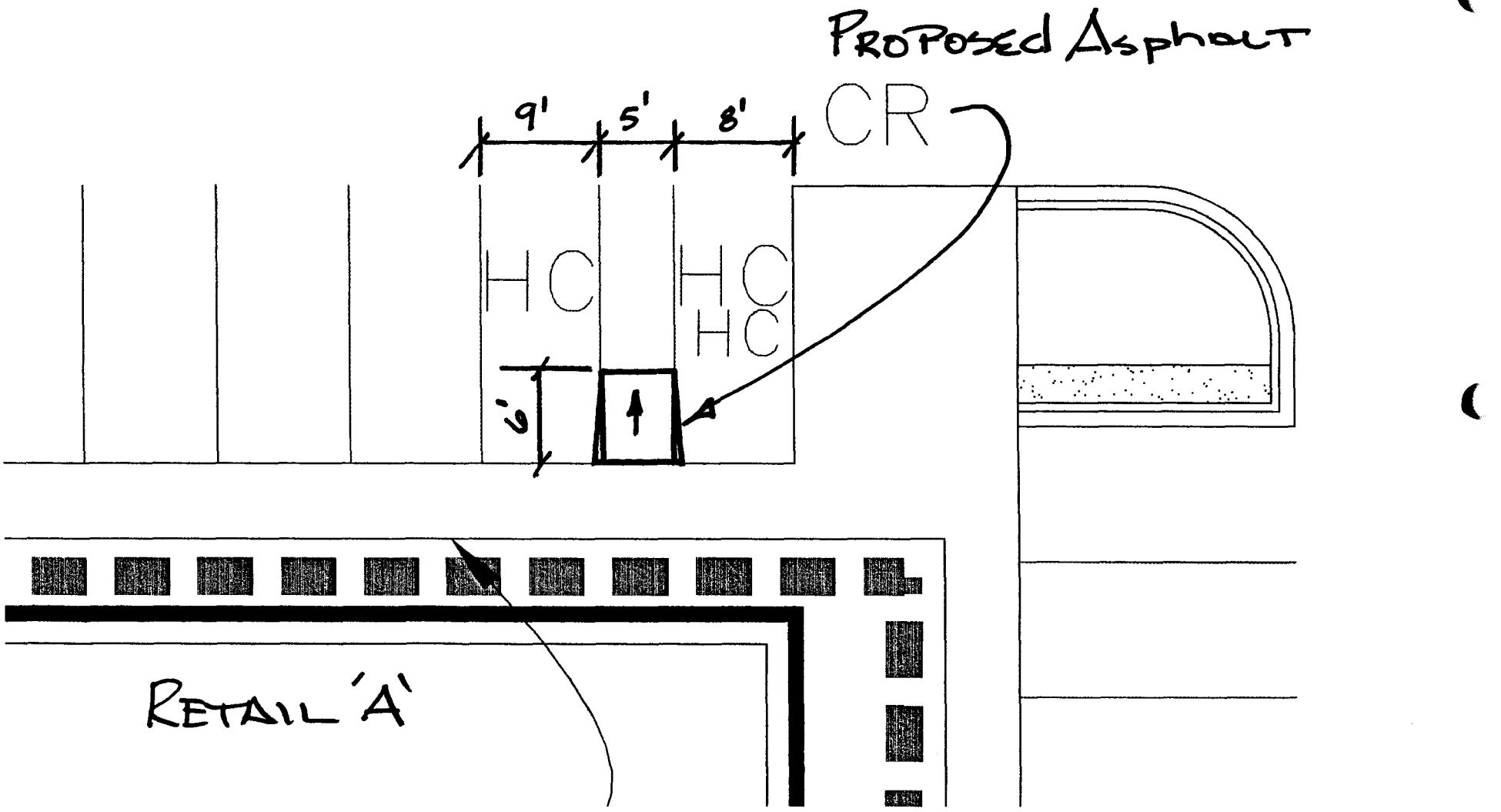
RECEIVED GRAND JUNCTION
PLANNING DEPARTMENT
FEB 18 1997

PLEASE CALL ME RE: DIA & ARE THEY OK?

THANKS
MS

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

02/18/97
SAFEWAY 1533
RETAIL A STRIPING
1" = 10'
SHEET 2 OF 2



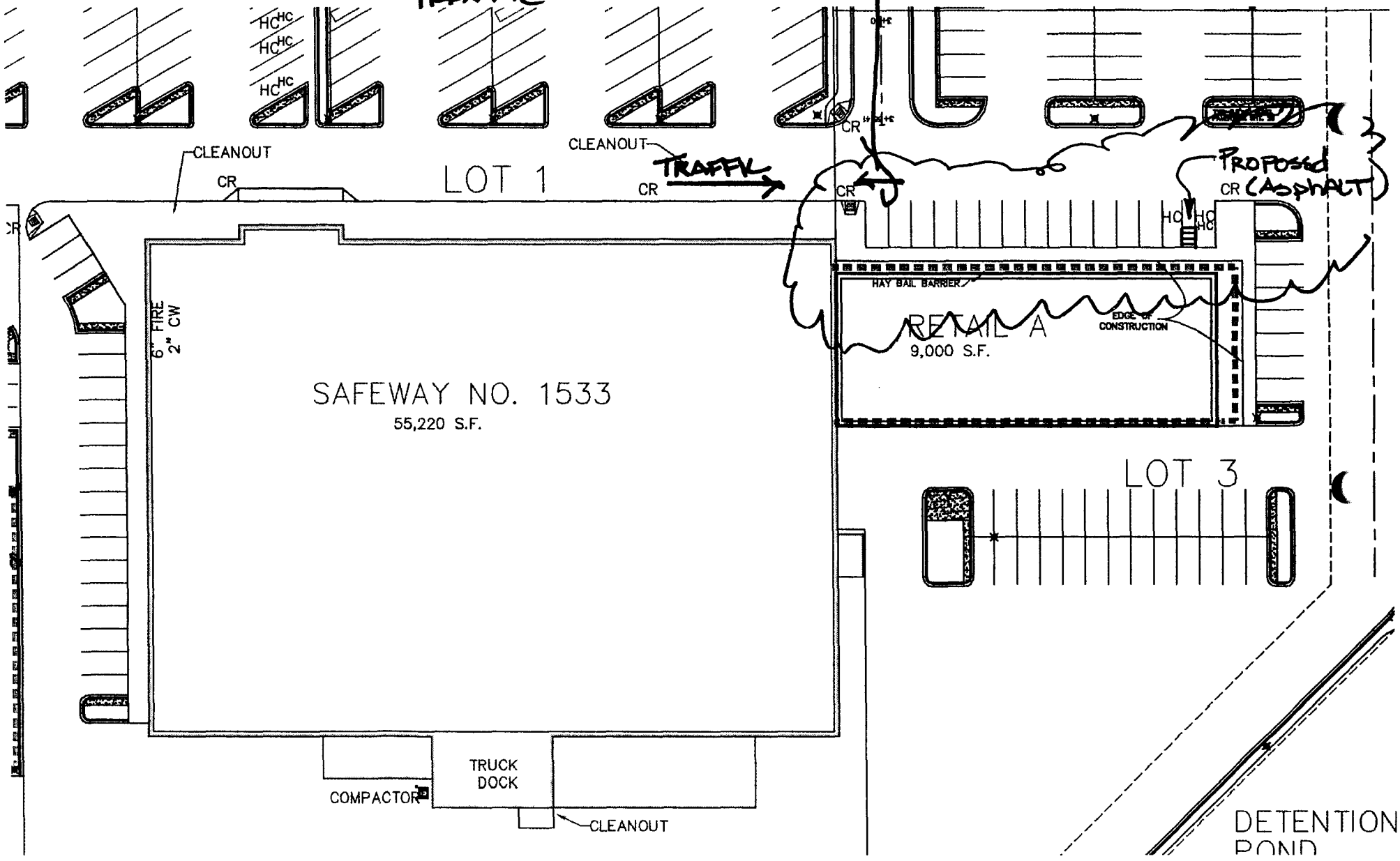
02/18/97

SAFEWAY 1533

RETAIL A STRIPING

NO SCALE

SHEET 1 OF 2



Punch List No. 2

Date: February 18, 1997

Project: SAFEWAY COTTONWOOD CENTRE

By: Monty Stroup

The following is a list of items to be corrected or completed based on a site inspection on 02/17/97. Replaces Punch List Dated 01/28/97.

Public Improvements 29 Road

1. Install striping (permanent).

2. Install CDOT Standard Delineators (Type 1), 6 Locations along asphalt taper.

3. Install 1 - Traffic Control Sign (R3-9b), west ROW.

4. Replace broken curb and gutter of north curb return at truck access.

Public Improvements F Road

1. Completed.

2. Completed.

3. Completed.

Private Site Improvements

1. Add 1 Handicap Symbol in front of Retail Pad A per City comments and install asphalt Handicap Ramp as directed by CWA.

2. Install 1 - Traffic Control Sign (R1-1) at north curb return of truck entrance from 29 Road.

3. Completed.

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4. Deleted this item, approved by Jody Kliska.

5. Install the following;

Asphalt	4,469	SY
Concrete V-pan	142	SF
18-inch curb & gutter	56	LF
LP and fixture @ 29 Rd.	6	EA

6. Install site Landscaping.

7. Remove concrete forms from inside of Storm Sewer Inlet B8. Remove construction debri from all inlets.

cc: Jody Kliska
Michael Drollinger
Brian Hannig
Gary Harrison

AGREEMENT

THIS AGREEMENT is made and entered into as of the 7th day of August, 1996 between SAFEWAY INC., a Delaware corporation, ("Safeway") and EARL ISOM and VERLA ISOM, husband and wife, (the "Isoms").

RECITALS

A. Safeway is the leasehold owner of certain real property located at the southeast corner of 29 Road and Patterson Road (also known as "F" Road) in the City of Grand Junction, County of Mesa, State of Colorado upon which Safeway intends to develop a shopping center, commonly known as the Safeway Cottonwood Centre (the "Safeway Development").

B. The Isoms are the fee owners of certain real property located immediately east of the Safeway Development, commonly known as 2917 Patterson Road, Grand Junction, Colorado (the "Isom Property").

C. On June 14, 1996, the Grand Junction Planning Department issued an administrative decision approving a site plan for the Safeway Development.

D. On or about June 18, 1996, the Isoms appealed the Planning Department's administrative decision to the Grand Junction Planning Commission, arguing that the driveway to be constructed on the eastern boundary of the Safeway Development contiguous to the Isom Property would, among other things, interfere with access to and visibility of the Isom Property.

E. At a public hearing held on July 9, 1996, the Grand Junction Planning Commission approved the site plan for the Safeway Development, subject to certain conditions. The Commission encouraged Safeway and the Isoms to come to a mutual agreement with regard to the Isoms concerns about the easternmost driveway in the Safeway Development. Safeway and the Isoms have now come to an agreement with regard thereto, the terms of which are set forth below.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereby agree as follows:

TERMS

1. Upon execution of this Agreement, Safeway shall pay to the Isoms the sum of Thirty Thousand and No/100 Dollars ($30,000.00). The purpose of this payment is to provide sufficient funds to the Isoms to construct a new driveway on the Isom Property located east of the Isom's current driveway, to abandon the current driveway, to reconfigure the Isom's garage so that the garage entry will be located on the south side rather than the north side of the Isom Property and to install landscaping (the "Isom

Improvements"). Safeway shall not be required to construct the Isom Improvements, or ensure that the Isom Improvements are constructed on the Isom Property. The Isoms shall not be required to account to Safeway for the expenditure of the money paid by Safeway to the Isoms and the Isoms may spend the money hereby paid by Safeway to the Isoms as the Isoms deem appropriate.

2. Safeway hereby agrees not to oppose the Isoms' efforts to obtain a permit to construct the Isom Improvements. The Isoms shall obtain the Isom Improvements permit at their sole cost, risk and expense. If the Isoms are unable to obtain a permit to construct the Isom Improvements from the governmental agency having jurisdiction thereover, this Agreement shall nonetheless remain in full force and effect.

3. Safeway hereby agrees that the cinder block fence, six feet (6') in height, to be constructed on the eastern boundary of the Safeway Development shall extend to the northern boundary of the Safeway Development as depicted on the site plan and shall be tapered on the northern boundary to provide visibility for vehicles entering "F" Road from the driveway on the eastern side of the Safeway Development and from the Isom Property.

4. The Isoms and Safeway agree that this Agreement shall satisfy the condition outlined by the Grand Junction Planning Commission on July 9, 1996 regarding the easternmost driveway from the Safeway Development onto "F" Road. The Isoms hereby agree that they shall not commence any district court action or administrative action for the purpose of setting aside or reversing the administrative decision made by the Grand Junction Planning Commission approving the site plan for the Safeway Development and the Isoms hereby waive their right to do so.

5. Safeway and the Isoms agree that this Agreement is confidential and neither party shall disclose the terms of this Agreement or the consideration paid by Safeway to the Isoms to any third party, except the City of Grand Junction if so requested by the City of Grand Junction.

6. This Agreement shall constitute the entire agreement between the parties hereto, there being no collateral oral or written agreements. This Agreement may be executed in multiple counterparts, each of which shall be deemed to be an original, but all of which, together, shall constitute one and the same instrument.

7. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, devisees, successors and assigns.

/
/
/
/
/

SIGNATURES ON THE FOLLOWING PAGE

EXECUTED as of the day and year first above written.

SAFEWAY INC.
a Delaware corporation

By: _____
Its Assistant Vice President

By: _____
Its Assistant Secretary

THE ISOMS
husband and wife

_____
Earl Isom

_____
Verla Isom

NEIL N. RUEBSAMEN, PE, CSP
Professional Service

2322 W. Oklahoma
P.O. Box 728
Grand Island, NE 68802

800-452-5286
308-384-8369

August 18, 1992

Sir:

On behalf of the request by Kroy Industries at York, Nebraska, noise level samples were taken along a Hi-way to determine the dampening effect created by using Kroy fabricated PVC fence as a barrier.

The test program was discussed and the protocal developed. A test barrier was set up along a four-lane Hi-way. Noise level readings were taken simultaneously on both sides of the barrier. Upon conclusion of each of the two tests, the average noise level in decibels (A-Scale) during the test was recorded.

Both instruments were calibrated prior to the test and the following equipment and parameters were used.

Noise Measuring Equipment:	Metrosonics db308 Sound Level Meters. SN#1936 and SN#2795
Location:	The test site was set up on the west side of U.S. Hwy. 81 about 1 mile north of where it intersects Interstate 80.
Fence and Arrangement:	Two panels of (1"x8" side-by-side slats) 6 ft. x 6 ft. were connected at a 90 degree angle. The point of the angle was pointed towards the 4-lane Hwy and was set back 54 ft. from the edge of the roadway.
Date of Test:	August 13, 1992
Placement of the Microphones (both tests):	1. The instrument outside the fence was located 2 ft. from the fence and 5 ft. above the ground. 2. The other instrument was behind the fence away from traffic noise. The microphone was located 8" from the fence and 4 ft. above the ground.
Calibration:	Both instruments were calibrated with a Metrosonics, Inc. Model # CL304; SN-3681.

- FIELD REPORT -

NOISE SURVEY RECORD

COMPANY/LOCATION Kroy Industries, York, Pa.

SURVEYOR NEIL N. RUEBSAMEN, PE-CSP

SURVEY INSTRUMENT Metrosonic db...

SURVEY DATE 8/13/92

FACTORY CAL. DATE Calibrator 7/4/92

Model CL304

SERIAL NO./UNIT 3681 CALIB.

CSP
NEIL N. RUEBSAMEN
3036
CERTIFIED SAFETY PROFESSIONAL

Start of Day:
1. Turn unit on
2. Check battery
3. Calibrate: record data
4. Place unit on Employee, or in work area
5. Turn on unit & record time

End of Day:
1. Record time off
2. Check battery
3. Read unit, record dB or dose
4. Recalibrate: record data

WORK AREA	EMPLOYEE NAME	CALIBRATION READING START/FINISH	TIME ON	DURATION OF TEST	READING % Dose	FULL WORKDAY EXPOSURE % Proj. Dose	EQUIV. SOUND L-Av. (dBA)	LM/LP	COMMENTS: TYPICAL DUTIES, WORK LOAD, ETC.
Test #1	—	~~102.0/102.0~~							
Between Fence and Hiway		102.0/102.0	2:46PM	6 MIN. 54 sec			67.6		Sampler # 1936
Behind Fence		102.0/102.0	2:46PM	6 MIN. 55 sec.			59.3		Sampler # 2795
Test #2									
Between Fence and Hi-way		102.0/102.0	2:55PM	8 MIN. 43 sec			64.0		Sampler # 1936
Behind Fence		102.0/102.0	2:55PM	8 MIN. 43 sec			55.4		Sampler # 2795
		LAST ITEM							

TEST RESULTS

TEST #1

Sampler Location	Duration of Test	Wt. Av. Sound Level
1. Between fence & road	6 Min. 54 Sec.	67.6dBA
2. Behind fence	8 Min. 43 Sec.	55.4 dBA

TEST #2

Sampler Location	Duration of Test	Wt. Av. Sound Level
1. Between fence & road	8 Min. 43 Sec.	64.0 dBA
2. Behind fence	8 Min. 43 Sec.	55.4 dBA

In summary, the attenuation provided by the fence in Test #1 was 8.3 dBA and in Test #2 it was 8.6 dBA. As one evaluated these results, it should be remembered that lowering a dB level by 5 decibels represents a 50% reduction in intesity. A copy of my field report is attached for your record.

I thank you for the opportunity to be of service.

Sincerely,

BCSPOA CERTIFIED SAFETY PROFESSIONAL NEIL N. RUEBSAMEN 9836

Neil N. Ruebsamen, PE-CSP

DIA BK 2264
PG 640-651

CITY OF GRAND JUNCTION
DEPARTMENT OF PUBLIC WORKS & UTILITIES
250 NORTH 5TH STREET
GRAND JUNCTION, CO 81501
(970) 244-4003

TO THE MESA COUNTY CLERK & RECORDER:

THIS IS TO CERTIFY that the herein named Subdivision Plat,

SAFEWAY COTTONWOOD CENTRE,

Situated in the NW 1/4 of Section 8,

Township 1 SOUTH, Range 1 EAST,

of the UTE Meridian in the City of Grand Junction, County of Mesa, State of Colorado, has been reviewed under my direction and, to the best of my knowledge, satisfies the requirements pursuant to C.R.S. 38-51-106 and the Zoning and Development Code of the City of Grand Junction for the recording of subdivision plats in the office of the Mesa County Clerk and Recorder.

This certification makes no warranties to any person for any purpose. It is prepared to establish for the County Clerk and Recorder that City review has been obtained. This certification does not warrant: 1) title or legal ownership to the land hereby platted nor the title or legal ownership of adjoiners; 2) errors and/or omissions, including, but not limited to, the omission(s) of rights-of-ways and/or easements, whether or not of record; 3) liens and encumbrances, whether or not of record; 4) the qualifications, licensing status and/or any statement(s) or representation(s) made by the surveyor who prepared the above-named subdivision plat.

Dated this 13 day of September, 1996.

City of Grand Junction,
Department of Public Works & Utilities

By: James L. Shanks
James L. Shanks, P.E., P.L.S.
Director of Public Works & Utilities

Recorded in Mesa County

Date: _____

Plat Book: 15 Page: 161 162

Drawer: CC72

1771222 1017AM 09/16/96
MONIKA TODD CLK&REC MESA COUNTY CO

g:\special\platcert.doc

"F" Road

29 Road

DRIVE

DRIVE

DRIVE

6' WIDE DETACHED SIDEWALK

6' WIDE DETACHED SIDEWALK

SIGN

4,200 S.F.
PAD NO. 1

PAD NO. 3
3,600 S.F.

HC

SAFEWAY NO. 1533
55,220 S.F.

RETAIL A
9,000 S.F.

PAD NO. 2
9,000 S.F.

DETENTION POND

6'-0": HIGH MASONRY FENCE

6'-0": HIGH MASONRY FENCE

Landscape Plan

SCALE: 1"=50'-0"

0 50 100 200

5 25

NORTH

7-1-96

"F" Road

29 Road

DRIVE

DRIVE

DRIVE

6' WIDE DETACHED SIDEWALK

6' WIDE DETACHED SIDEWALK

SIGN

4,200 S.F.
PAD NO. 1

HC

PAD NO. 3
3,600 S.F.

HC

HC

DR

T

HC
HC
HC
HC

CR

CR

CR

CR

CR

CR

CR

CR

HC HC

SAFEWAY NO. 1533
55,220 S.F.

RETAIL A
9,000 S.F.

T

HC HC

PAD NO. 2
9,000 S.F.

T

6'-0": HIGH
MASONRY FENCE

DETENTION
POND

6'-0": HIGH
MASONRY FENCE

CARS

TRUCKS

Site Plan

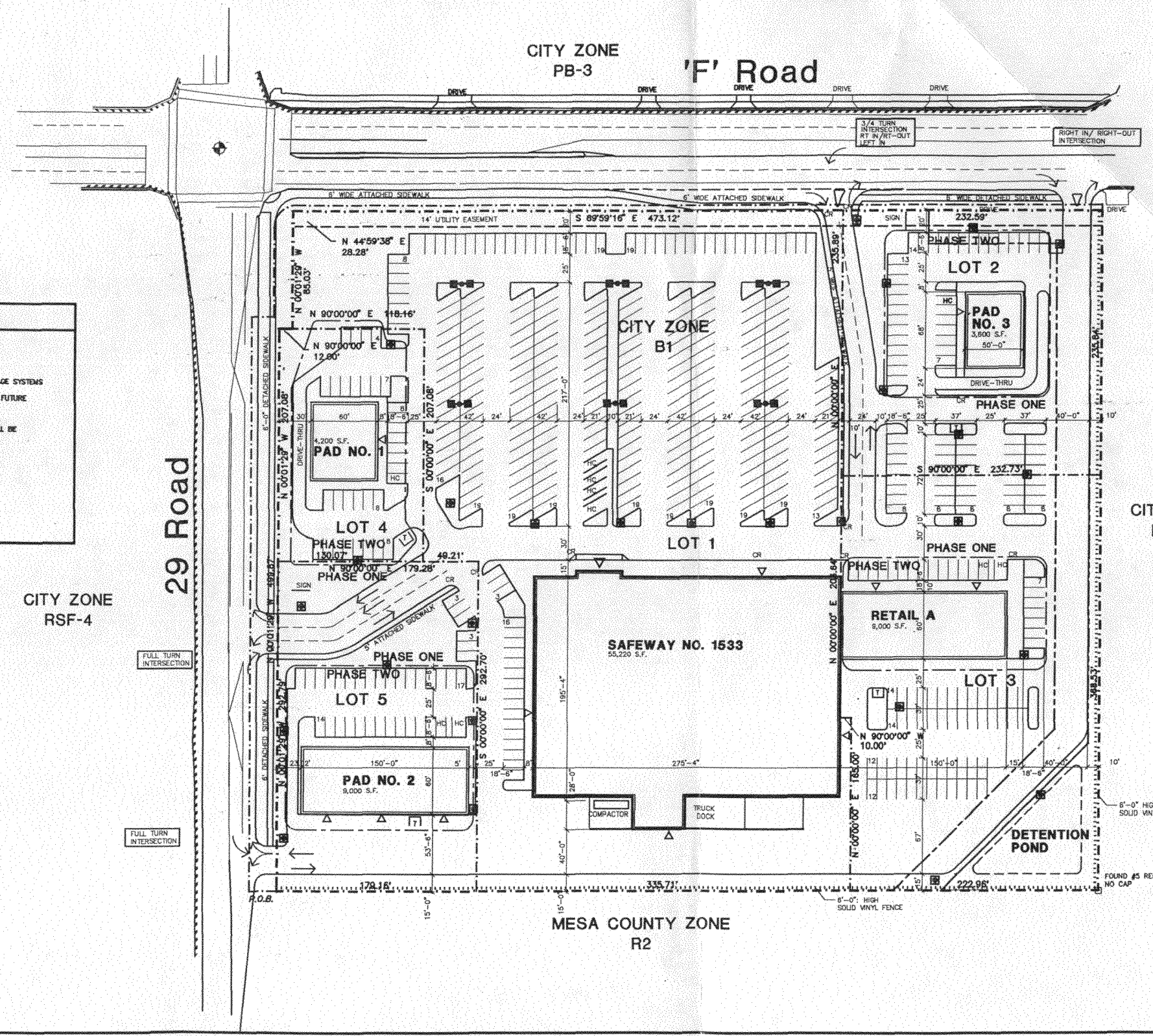
SCALE: 1"=80'-0"
0 50 100 200
5 25

NORTH

7-1-96
153SPROM.DWG

Safeway Cottonwood Centre

DEVELOPMENT PLAN
NW 1/4, NW 1/4 SECTION 8, T1S, R1E, UTE MERIDIAN
LOCATED AT 'F' ROAD AND 29 ROAD
CITY OF GRAND JUNCTION AND STATE OF COLORADO



NOTES

1. REFER TO CIVIL DESIGN DOCUMENTS FOR ROAD ALIGNMENT AND LANE DESIGNATION LAYOUT
2. REFER TO CIVIL DESIGN DOCUMENTS FOR UTILITY SYSTEMS
3. REFER TO CIVIL DESIGN DOCUMENTS FOR GRADING AND DRAINAGE SYSTEMS
4. PHASING REFERS TO INITIAL CONSTRUCTION (PHASE ONE) AND FUTURE CONSTRUCTION BY OTHER DEVELOPERS (PHASE TWO).
5. LAYOUT OF PAD SITES AND PAD BUILDING CONFIGURATION IS APPROXIMATE AND MAY VARY. FINAL PAD CONFIGURATIONS WILL BE RESUBMITTED AS AN AMENDMENT TO THE DEVELOPMENT PLAN.

LEGEND

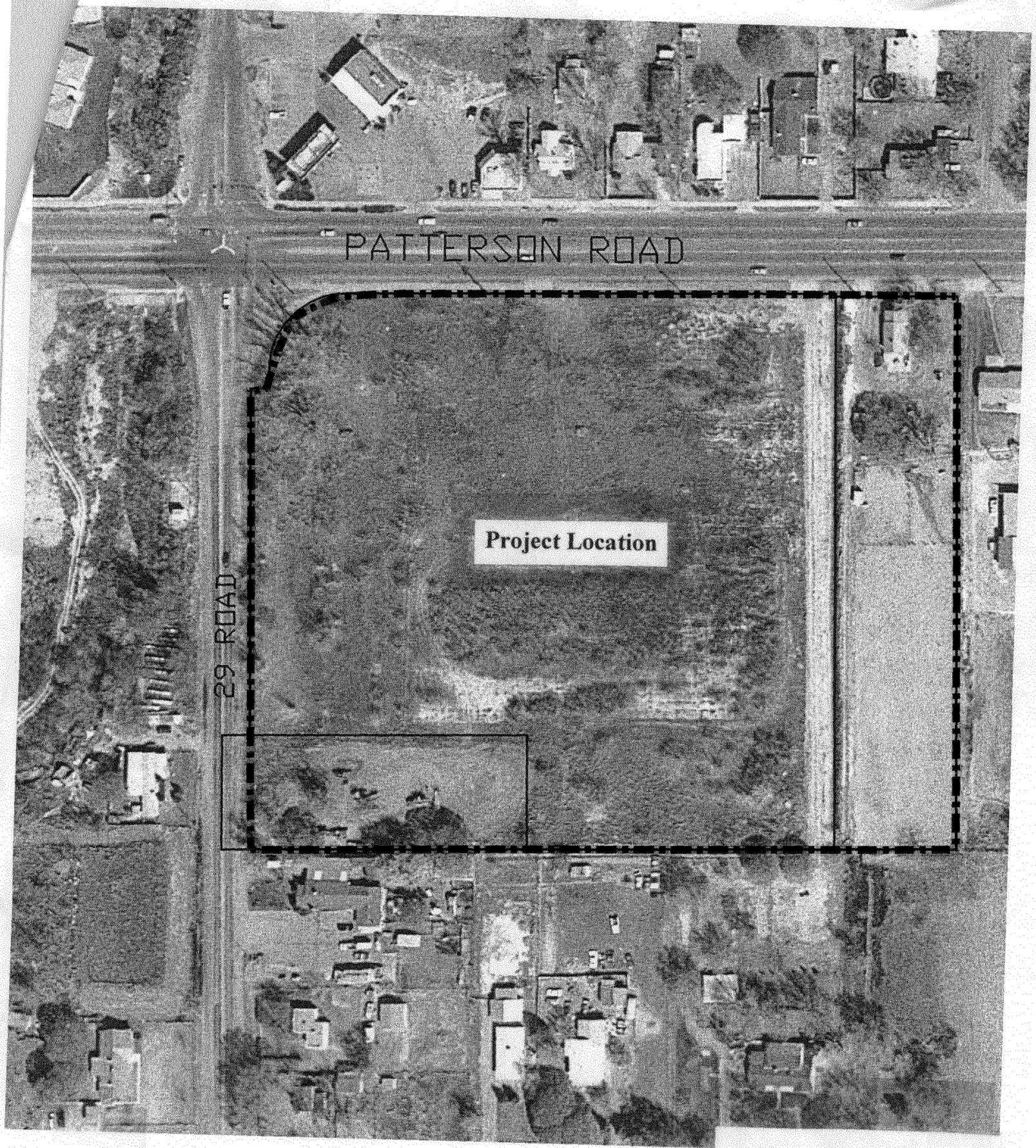
- △ BUILDING ENTRANCE\EXIT
- ACCESSIBLE PARKING STALL
- CR CURB RAMP
- SLP SITE LIGHT POLE – DOUBLE HEAD
- SLP SITE LIGHT POLE – SINGLE HEAD
- PP POWER POLE
- SD DI STORM DRAIN–DROP INLET
- FH FIRE HYDRANT
- CC CART CORRAL
- FL FIRE LANE SIGN
- SS STOP SIGN
- T TRASH DUMPSTER ENCLOSURE
- FENCE

Site Plan

SCALE: 1"=50'-0"
0 50 100 200
5 25
NORTH

CONCEPTS WEST ARCHITECTURE, INC.
COLORADO SPRINGS, CO.
4-26-96

SAFEWAY COTTONWOOD CENTRE
SHEET 2 OF 35
1533SP.DWG



N

AERIAL PHOTOGRAPH

MS-96-53
Safeway Cottonwood Centre
Site Plan Review

FINAL APPROVAL CHECKLIST
SAFEWAY COTTONWOOD CENTRE

- o 1. Development Improvements Agreement (DIA) # - have draft
- o 2. Improvements Guarantee (type used: Letter of Credit) #
- o 3. Final Plans #
- o 4. Articles of Incorporation of HOA - ask John S.
- o 5. CC$Rs
- o 6. Plat
- o 7. Disk of Plat
- ✓ 8. UCC Approval
- o 9. TCP Credit Request
- o 10. City Surveyor Certificate
- o 11. RECORDING FEES

: Minimum required for commencement of construction

FEES

Open Space Fees - $ N/A

TCP - $ _____/lot

School Impact Fee - $ N/A /lot

DEVELOPMENT IMPROVEMENTS AGREEMENT

1. **Parties:** The parties to this Development Improvements Agreement ("the Agreement") are SAFEWAY, INC. ("the Developer") and **THE CITY OF GRAND JUNCTION,** Colorado ("the City").

THEREFORE, for valuable consideration, the receipt and adequacy of which is acknowledged, the Parties agree as follows:

2. **Effective Date:** The Effective Date of the Agreement will be the date that this agreement is recorded ~~which is not sooner than recordation of the~~ _____ _____.

RECITALS

The Developer seeks permission to develop property within the City to be known as SAFEWAY COTTONWOOD CENTRE, which property is more particularly described on Exhibit "A" attached and incorporated by this reference (the "Property"). The City seeks to protect the health, safety and general welfare of the community by requiring the completion of various improvements in the development and limiting the harmful effects of substandard developments. The purpose of this Agreement is to protect the City from the cost of completing necessary improvements itself and is not executed for the benefit of materialmen, laborers, or others providing work, services or material to the development or for the benefit of the purchasers or users of the development. The mutual promises, covenants, and obligations contained in this Agreement are authorized by state law, the Colorado Constitution and the City's land development ordinances.

DEVELOPER'S OBLIGATION

3. **Improvements:** The Developer will design, construct and install, at its own expense, those on-site and off-site improvements listed on Exhibit "B" attached and incorporated by this reference. The Developer agrees to pay the City for inspection services performed by the City, in addition to amounts shown on Exhibit B. The Developer's obligation to complete the improvements is and will be independent of any obligations of the City contained herein.

4. **Security:** To secure the performance of its obligations under this Agreement (except its obligations for warranty under paragraph 6), the Developer will enter into an agreement which complies with either option identified in paragraph 28, or other written agreement between the City and the Developer.

5. **Standards:** The Developer shall construct the Improvements according to the standards and specifications required by the City Engineer or as adopted by the City.

6. **Warranty:** The Developer warrants that the Improvements, each and every one of them, will be free from defects for a period of twelve (12) months from the date that the City Engineer accepts or approves the improvements completed by the Developer.

7. **Commencement and Completion Periods:** The improvements, each and every one of them, will be completed within 6 Months from the Effective Date of this Agreement (the "Completion Period").

8. **Compliance with Law:** The developer shall comply with all relevant federal, state and local laws, ordinances, and regulations in effect at the time of final approval when fulfilling its obligations under this Agreement.

9. **Notice of Defect:** The Developer's Engineer shall provide timely notice to the Developer, contractor, issuer of security and the City Engineer whenever inspection reveals, or the Developer's Engineer otherwise has knowledge, that an improvement does not conform to City standards and any specifications approved in the

development application or is otherwise defective. The developer will have thirty (30) days from the issuance of such notice to correct the defect.

10. **Acceptance of Improvements:** The City's final acceptance and/or approval of improvements will not be given or obtained until the Developer presents a document or documents, for the benefit of the City, showing that the Developer owns the improvements in fee simple and that there are no liens, encumbrances, or other restrictions on the improvements. Approval and/or acceptance of any improvements does not constitute a waiver by the City of any rights it may have on account of any defect in or failure of the improvement that is detected or which occurs after approval and/or acceptance.

11. **Use of Proceeds:** The City will use funds deposited with it or drawn pursuant to any written disbursement agreement entered into between the parties only for the purpose of completing the Improvements or correcting defects in or failure of the Improvements.

12. **Events of Default:** The following conditions, occurrences or actions will constitute a default by the Developer during the Completion Period:

a. Developer's failure to complete each portion of the Improvements in conformance with the agreed upon time schedule; the City may not declare a default until a fourteen (14) calendar day notice has been given to the Developer;

b. Developer's failure to demonstrate reasonable intent to correct defective construction of any improvement within the applicable correction period; the City may not declare a default until a fourteen (14) calendar day notice has been given to the Developer;

c. Developer's insolvency, the appointment of a receiver for the Developer or the filing of a voluntary or involuntary petition in bankruptcy respecting the Developer; in such event the City may immediately declare a default without prior notification to the Developer;

d. Notification to the City, by any lender with a lien on the property, of a default on an obligation; the City may immediately declare a default without prior notification to the Developer;

e. Initiation of any foreclosure action of any lien or initiation of mechanics lien(s) procedure(s) against the Property or a portion of the Property or assignment or conveyance of the Property in lieu of foreclosure; the City may immediately declare a default without prior notification to the Developer.

13. **Measure of Damages:** The measure of damages for breach of this Agreement by the Developer will be the reasonable cost of satisfactorily completing the Improvements plus reasonable City administrative expenses. For improvements upon which construction has not begun, the estimated costs of the Improvements as shown on Exhibit "B" will be prima facie evidence of the minimum cost of completion; however, neither that amount nor the amount of a letter of credit, the subdivision improvements disbursement agreement or cash escrow establish the maximum amount of the Developer's liability.

14. **City's Rights Upon Default:** When any event of default occurs, the City may draw on the letter of credit, escrowed collateral, or proceed to collect any other security to the extent of the face amount of the credit or full amount of escrowed collateral, cash, or security less ninety percent (90%) of the estimated cost (as shown on Exhibit "B") of all improvements previously accepted by the City or may exercise its rights to disbursement of loan proceeds or other funds under the improvements disbursement agreement. The City will have the right to complete improvements itself or it may contract with a third party for completion, and the Developer grants to the City, its successors, assigns, agents, contractors, and employees, a nonexclusive right and easement to enter the Property for the purposes

of constructing, reconstructing, maintaining, and repairing such improvements. Alternatively, the City may assign the proceeds of the letter of credit, the improvements disbursement agreement, the escrowed collateral, cash, or other funds or assets to a subsequent developer (or a lender) who has acquired the development by purchase, foreclosure or otherwise who will then have the same rights of completion as the City if and only if the subsequent developer (or lender) agrees in writing to complete the unfinished improvements and provides reasonable security for the obligation. In addition, the City may also enjoin the sale, transfer, or conveyance of lots within the development, until the improvements are completed or accepted. These remedies are cumulative in nature and are in addition to any other remedies the City has at law or in equity.

15. **Indemnification:** The Developer expressly agrees to indemnify and hold the City, its officers, employees and assigns harmless from and against all claims, costs and liabilities of every kind and nature, for injury or damage received or sustained, or alleged to be received or sustained, by any person or entity in connection with, or on account of, any act or failure to act concerning the performance of work at the development or the Property pursuant to this Agreement. The Developer further agrees to aid and defend the City in the event that the City is named in an action concerning the performance of work or the failure to perform work pursuant to this Agreement. The Developer is not an agent or employee of the City.

16. **No Waiver:** No waiver of any provision of this Agreement by the City will be deemed or constitute a waiver of any other provision, nor will it be deemed or constitute a continuing waiver unless expressly provided for by a written amendment to this Agreement signed by both City and Developer; nor will the waiver of any default under this Agreement be deemed a waiver of any subsequent default or defaults of the same type. The City's failure to exercise any right under this Agreement will not constitute the approval of any wrongful act by the Developer or the acceptance of any improvement.

17. **Amendment or Modification:** The parties to this Agreement may amend or modify this Agreement only by written instrument executed on behalf of the City by the City Manager or his designee and by the Developer or his authorized officer. Such amendment or modification shall be properly notarized before it shall be deemed effective.

18. **Attorney's Fees:** Should either party be required to resort to litigation to enforce the terms of this Agreement, the prevailing party, plaintiff or defendant, will be entitled to costs, including reasonable attorney's fees and expert witness fees, from the opposing party; any City obligation under this section shall be subject to the overriding provisions of section 15, above. If the court awards relief to both parties, the attorney's fees may be equitably divided between the parties by the decision maker, subject to the overriding provisions of section 15, above.

19. **Vested Rights:** The City does not warrant by this Agreement that the Developer is entitled to any other approval(s) required by the City, if any, before the Developer is entitled to commence development or to transfer ownership of property in the development.

20. **Third Party Rights:** No person or entity who or which is not a party to this Agreement will have any right of action under this Agreement.

21. **Time:** For the purpose of computing the Abandonment and Completion Periods, and time periods for City action, such times in which war, civil disasters, or acts of God occur or exist will not be included if such times prevent the Developer or City from performing its obligations under the Agreement.

22. **Severability:** If any part, term, or provision of this Agreement is held by a court or courts of competent jurisdiction to be illegal or otherwise unenforceable, such illegality or unenforceability will not affect the validity of any other part, term, or provision and the rights of the parties will be construed as if the part, term, or provision was never part of the Agreement.

23. **Benefits/burdens:** The benefits of this Agreement to the Developer are personal and may not be assigned without the express written approval of the City. Such approval may not be unreasonably withheld, but any unapproved assignment is void. Notwithstanding the foregoing, the burdens of this Agreement are personal obligations of the Developer and also shall be binding on the heirs, successors, and assigns of the Developer, and shall be a covenant(s) running with the Property. There is no prohibition on the right of the City to assign its rights under this Agreement. The City will expressly release the original Developer's guarantee or obligations under the improvements disbursement agreement if it accepts new security from any developer or lender who obtains the Property. However, no other act of the City will constitute a release of the original Developer from his liability under this Agreement.

24. **Notice:** Any notice required or permitted by this Agreement will be deemed effective when personally delivered in writing or three (3) days after notice is deposited with the U.S. Postal Service, postage prepaid, certified, and return receipt requested, and addressed as follows:

If to Developer: SAFEWAY, INC
6900 S. YOSEMITE
ENGLEWOOD, CO 80112

If to City: City of Grand Junction
Community Development Director
250 N. 5th Street
Grand Junction, Colorado 81501

25. **Recordation:** Developer shall pay for all costs to record a copy of this Agreement in the Clerk and Recorder's Office of Mesa County, Colorado.

26. **Immunity:** Nothing contained in this Agreement constitutes a waiver of the City's immunity under any applicable law.

27. **Personal Jurisdiction and Venue:** Personal jurisdiction and venue for any civil action commenced by either party to this Agreement whether arising out of or relating to the Agreement, letter of credit, improvements disbursements agreement, or cash escrow agreement or any action to collect security will be deemed to be proper only if such action is commenced in Mesa County, Colorado. The Developer expressly waives his right to bring such action in or to remove such action to any other court whether state or federal.

28. **Improvements guarantee.** The improvements guarantee required by the City to ensure that the improvements described in the improvements agreement are constructed to City standards may be in one of the following forms: (If I or II, then attach as Exhibit C.)

____ (I) disbursement agreement between a bank doing business in Mesa County and the City, or

X (II) a good and sufficient letter of credit acceptable to the City, or

____ (III) depositing with the City cash equivalent to the estimated cost of construction of the improvements under the following terms:

(a) The Finance Department of the City may act as disbursing agent for disbursements to Developer's contractor(s) as required improvements are completed and accepted if agreed to in writing pursuant to a disbursement agreement; and

(b) The Finance Department of the City will disburse any deposit or any portion thereof, with no more than three checks, at no charge. If disbursements are made in excess of three checks, the developer will be charged $100 per transaction for every transaction in excess of three.

29. **Conditions of Acceptance.**

a. The City shall have no responsibility or liability with respect to any street, or other improvement(s), notwithstanding the use of the same by the public, unless the street or other improvements shall have been accepted by the City. "Acceptance by the City" means a separate writing wherein the City specifies which improvements have been accepted and the date from which warranty(ies) shall run.

b. Prior to requesting final acceptance of any street, storm drainage facility, or other required improvement(s), the Developer shall: (i) furnish to the City Engineer as-built drawings in reproducible form, blueline stamped and sealed by a professional engineer and in computer disk form and copies of results of all construction control tests required by City specifications; (ii) provide written evidence to the City Engineer under signature of a qualified expert that the earth, soils, lands and surfaces upon, in and under which the improvements have been constructed, or which are necessary for the improvements, are free from toxic, hazardous or other regulated substances or materials; (iii) provide written evidence to the City Engineer that the title to lands underlying the improvements are merchantable and free and clear from all liens and encumbrances, except those liens and encumbrances which may be approved in writing by the City Engineer.

30. **Phased Development.** If the City allows a street to be constructed in stages, the Developer of the first one-half street opened for traffic shall construct the adjacent curb, gutter and sidewalk in the standard location and shall construct the required width of pavement from the edge of gutter on his side of the street to enable an initial two-way traffic operation without on-street parking. That Developer is also responsible for end-transitions, intersection paving, drainage facilities, and adjustments to existing utilities necessary to open the street to traffic.

Kathleen M. Portner 3/20/97
Director of Community Development Date

City of Grand Junction
250 North 5th Street
Grand Junction, CO 81501

John Kenyon 4/24/97
Developer Date
(If Corporation, to be signed by President and attested to by Secretary together with the Corporate seals)

s:impagre2:6/22/95

EXHIBIT "A"

TYPE LEGAL DESCRIPTION BELOW, USING ADDITIONAL SHEETS AS NECESSARY. USE SINGLE SPACING WITH A ONE (1) INCH MARGIN ON EACH SIDE.

Commencing at the Southwest corner of the Northwest Quarter of the Northwest Quarter of Section 8, in Township 1 South, Range 1 East of the Ute Meridian, whence the Northwest corner of Section 8 bears North 00 degrees 01 minutes 29 seconds West, a distance of 1319.88 feet for a basis of bearings, with all bearings contained herein relative thereto; thence North 00 degrees 01 minutes 29 seconds West, a distance of 659.94 feet POINT OF BEGINNING;

Thence North 00 degrees 01 minutes 29 seconds West, a distance of 509.94 feet; thence North 89 degrees 58 minutes 31 seconds East, a distance of 50.00 feet; thence North 00 degrees 01 minutes 29 seconds West, a distance of 79.99 feet; thence North 44 degrees 59 minutes 38 seconds East, a distance of 28.28 feet to a point on the Southerly right of way of F Road; thence along said right of way South 89 degrees 59 minutes 16 seconds East, a distance of 722.70 feet; thence South 00 degrees 02 minutes 06 seconds East, a distance of 609.41 feet to a point on the South line of the N1/2 of the NW1/4 NW1/4; thence along said line South 89 degrees 58 minutes 17 seconds West, a distance of 792.82 feet; to the POINT OF BEGINNING.
Said parcel containing 10.977 Acres, as described.

EXHIBIT "B"

IMPROVEMENTS LIST/DETAIL

DATE: _____
NAME OF DEVELOPMENT: SAFEWAY COTTONWOOD CENTRE
LOCATION: S.E. CORNER 29 ROAD & F ROAD
PRINTED NAME OF PERSON PREPARING: MONTY D. STROUP

	UNITS	TOTAL QTY.	UNIT PRICE	TOTAL AMOUNT
I. SANITARY SEWER				
1. Clearing and grubbing				
2. Cut and remove asphalt				
3. PVC sanitary sewer main (incl. trenching, bedding & backfill)				
4. Sewer Services (incl. trenching, bedding, & backfill)				
5. Sanitary sewer manhole(s)				
6. Connection to existing manhole(s)				
7. Aggregate Base Course				
8. Pavement replacement				
9. Driveway restoration				
10. Utility adjustments				
II. DOMESTIC WATER				
1. Clearing and grubbing				
2. Cut and remove asphalt				
3. Water Main (incl. excavation, bedding, backfill, valves and appurtenances)				
4. Water services (incl. excavation, bedding, backfill, valves, and appurtenances)				
5. Connect to existing water line				
6. Aggregate Base Course				
7. Pavement Replacement				
8. Utility adjustments				
III. STREETS				
1. Clearing and grubbing				
2. Earthwork, including excavation and embankment construction				
3. Utility relocations				

4. Aggregate sub-base course (square yard)				
5. Aggregate base course (square yard)				
6. Sub-grade stabilization				
7. Asphalt or concrete pavement ~~(square yard)~~ ON SITE	L.S.	1	$9,000.00	$9,000.00
8. Curb, gutter & sidewalk ~~(linear feet)~~ ON SITE	L.S.	1	$5,000.00	$5,000.00
9. ~~Driveway sections~~ BIKE PATH ~~(square yard)~~ 29 ROAD	L.S.	1	$15,000.00	$15,000.00
10. Crosspans & fillets				
11. Retaining walls/structures				
12. Storm drainage system				
13. Signs and other traffic control devices (FINAL STRIPING)	L.S.	1	$12,500.00	$12,500.00
14. Construction staking				
15. Dust control				
16. Street lights (each)				
IV. LANDSCAPING				
1. Design/Architecture				
2. Earthwork (includes top soil, fine grading, & berming				
3. Hardscape features (includes ~~walls~~, fencing, ~~and paving~~) PAINT	L.S.	1	$14,000.00	$14,000.00
4. Plant material and planting	L.S.	1	$126,976.19	$126,976.19
5. Irrigation system				
6. Other features (incl. statues, water displays, park equipment, and outdoor furniture)				
7. Curbing				
8. Retaining walls and structures				
9. One year maintenance agreement				
V. MISCELLANEOUS				
1. Design/Engineering (AS BUILTS)	L.S.	1	$2,500.00	$2,500.00
2. Surveying				
3. Developer's inspection costs				
4. Quality control testing				
5. Construction traffic control				
6. Rights-of-way/Easements				

7. City inspection fees	L.S.	1	$2,000.00	$2,000.00
8. Permit fees				
9. Recording costs				
10. Bonds				
11. Newsletters				
12. General Construction Supervision				
13. Other				
14. Other				

TOTAL ESTIMATED COST OF IMPROVEMENTS: $ 186,976.19

John Kemp — 2/24/97

SIGNATURE OF DEVELOPER — DATE

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

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

3-4-97

CITY ENGINEER — DATE

3/20/97

COMMUNITY DEVELOPMENT — DATE

s:impagmt.rev-4/95

SPR-1996-107

James A. Weber
Gary M. Harrison

July 2, 1997

Mr. Michael Drollinger
City of Grand Junction
Community Development Department
250 North 5th Street
Grand Junction, CO 81501

Re: **Safeway Store No. 1533**
29 Road and F Road
Grand Junction, CO
Job No. 9529A

Dear Michael:

Now that construction of Safeway Store No. 1533 is complete, we request that our Check No. 10875, dated July 16, 1996, in the amount of $900.00, be returned. This check was issued for assurance of completion of the public improvements.

If you have any questions and/or require additional information, please contact this office.

Sincerely,

Gary M. Harrison, NCARB
Vice President

ch

\9529\W1079

CONCEPTS WEST ARCHITECTURE, INC. • ARCHITECTS AND PLANNERS
202 East Cheyenne Mountain Blvd., Suite Q • Colorado Springs, CO 80906
(719) 576-1555 (719) 576-1631 - Fax

SPR-1996-101

LANDesign

ENGINEERING • SURVEYING • PLANNING

September 22, 1997

RECEIVED GRAND JUNCTION
PLANNING DEPARTMENT

SEP 2 2 1997

Mr. Bill Nebeker
Planning Department.
City of Grand Junction
250 N 5th St.
Grand Junction, Co. 81501

Re: Right- of- Way, corrective deed.
Safeway Store- 29 and F road.

Dear Mr. Nebeker:

Please find enclosed the Original corrective deed for the right-of-way parcel that covers the relocated walk at the Safeway store located in LOT 1, Safeway Cottonwood Centre, Grand Junction, Colorado.

This deed was needed to cover the walk as it was built and correct the tie calls in the original easement deed (Book 2278, Page 187).

Please call if you have any questions.

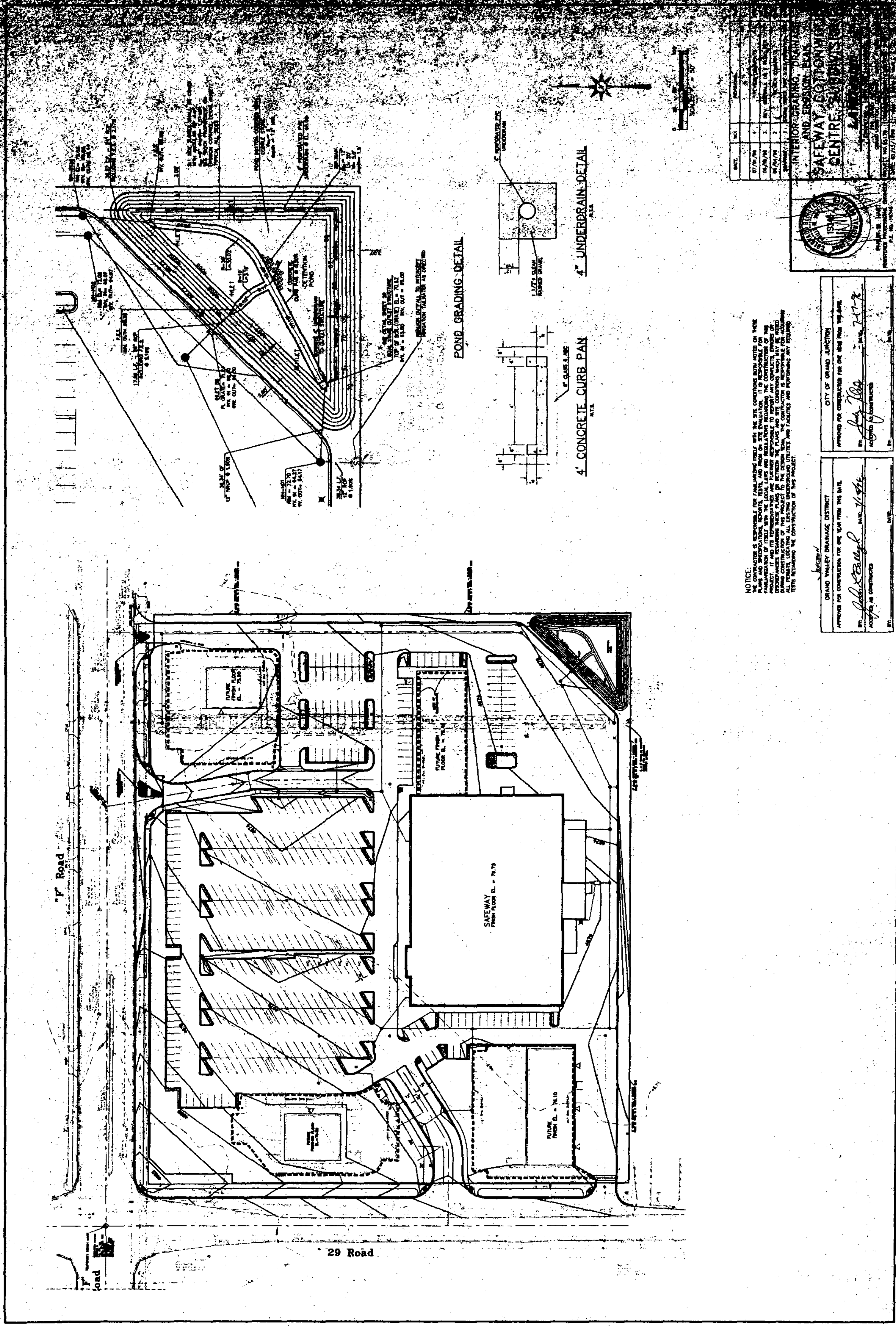
Sincerely,

Patrick R. Green

Patrick R. Green PLS

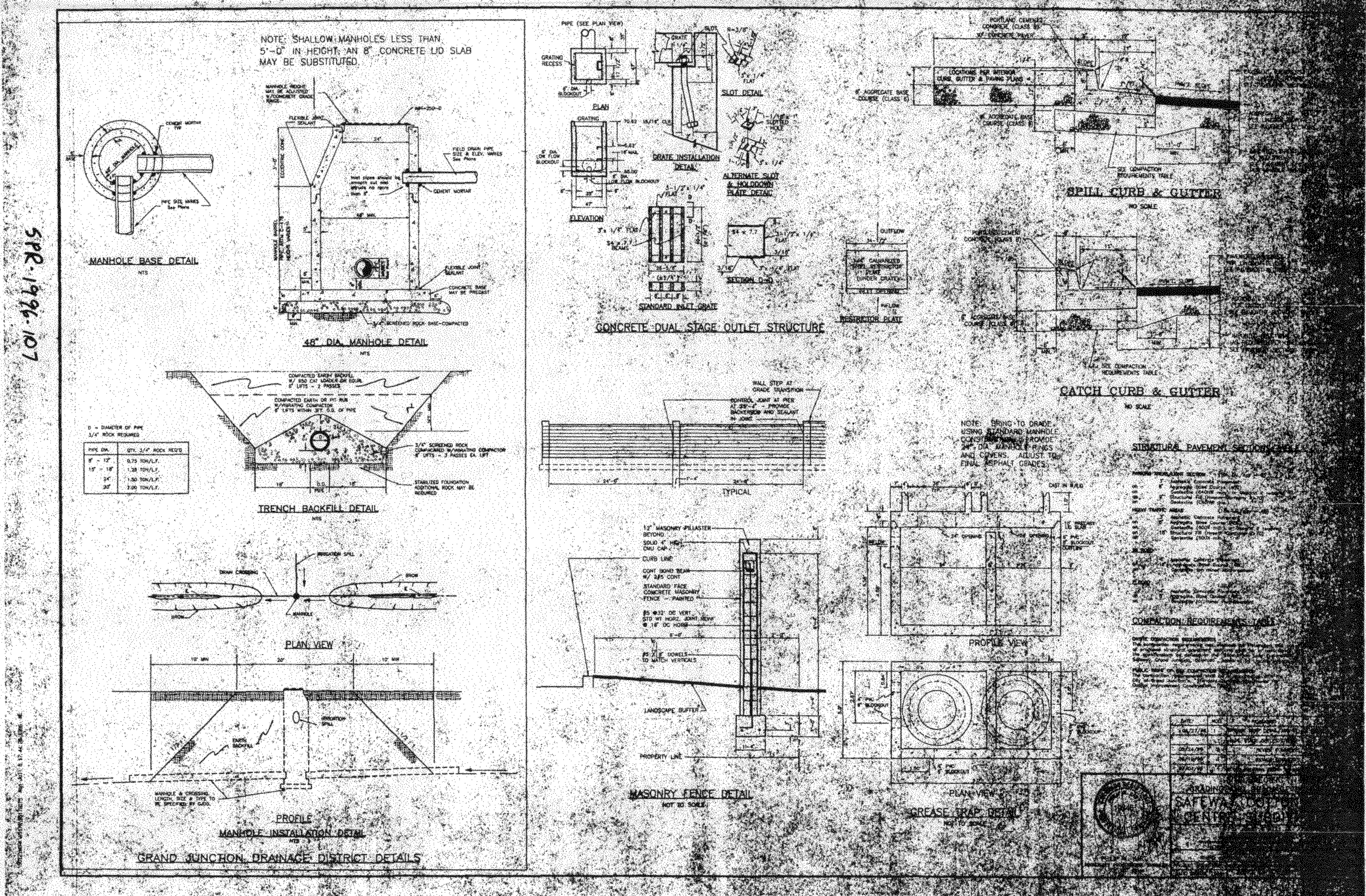
Cc: Brian Hannig - Safeway

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



"F" Road
29 Road
SAFEWAY
FINISH FLOOR EL = 78.75
POND GRADING DETAIL
DETENTION POND
4' CONCRETE CURB PAN
N.T.S.
4" UNDERDRAIN DETAIL
N.T.S.
NOTICE:
GRAND VALLEY DRAINAGE DISTRICT
CITY OF GRAND JUNCTION
INTERIOR GRADING, DRAINAGE AND EROSION PLAN
SAFEWAY COTTONWOOD CENTRE SUBDIVISION

SPR-1996-107


SPR-1996-107
NOTE: SHALLOW MANHOLES LESS THAN 5'-0" IN HEIGHT, AN 8" CONCRETE LID SLAB MAY BE SUBSTITUTED.
MANHOLE BASE DETAIL
48" DIA. MANHOLE DETAIL
TRENCH BACKFILL DETAIL
PLAN VIEW
PROFILE
MANHOLE INSTALLATION DETAIL
GRAND JUNCTION DRAINAGE DISTRICT DETAILS
PLAN
ELEVATION
SLOT DETAIL
GRATE INSTALLATION DETAIL
ALTERNATE SLOT & HOLDDOWN PLATE DETAIL
STANDARD INLET GRATE
SECTION D-D
RESTRICTOR PLATE
CONCRETE DUAL STAGE OUTLET STRUCTURE
TYPICAL
MASONRY FENCE DETAIL
NOT TO SCALE
NOTE: BRING TO GRADE USING STANDARD MANHOLE CONSTRUCTION. PROVIDE 24" DIA. MANHOLE RINGS AND COVERS. ADJUST TO FINAL ASPHALT GRADES.
PROFILE VIEW
PLAN VIEW
GREASE TRAP DETAIL
SPILL CURB & GUTTER
NO SCALE
CATCH CURB & GUTTER
NO SCALE
STRUCTURAL PAVEMENT SECTIONS
COMPACTION REQUIREMENTS TABLE
SAFEWAY