Table of Contents

File 1986-0015 Project Name: 1st Presbyterian Church of God – Courtland

Present	Scanned	
		A few items are denoted with an asterisk (*), which means they are to be scanned for permanent record on the in some instances, not all entries designated to be scanned by the department are present in the file. There are also documents specific to certain files, not found on the standard list. For this reason, a checklist has been provided. **Remaining items, (not selected for scanning), will be marked present on the checklist. This index can serve as a quick guide for the contents of each file.** **Files denoted with (**) are to be located using the ISYS Query System. Planning Clearance will need to be typed in full, as well as other entries such as Ordinances, Resolutions, Board of Appeals, and etc.**
X	X	**Table of Contents**
X	X	**Review Sheet Summary**
X		Application form
		Review Sheets
		Receipts for fees paid for anything
		***Submittal checklist**
X	X	***General project report**
		Reduced copy of final plans or drawings
X		Reduction of assessor's map
		Evidence of title, deeds, easements
X	X	***Mailing list to adjacent property owners**
		Public notice cards
		Record of certified mail
X		Legal description
		Appraisal of raw land
		Reduction of any maps – final copy
		***Final reports for drainage and soils (geotechnical reports)**
		Other bound or non-bound reports
		Traffic studies
		Individual review comments from agencies
X	X	***Petitioner's response to comments**
		***Staff Reports**
		***Planning Commission staff report and exhibits**
		***City Council staff report and exhibits**
		***Summary sheet of final conditions**
		***Letters and correspondence dated after the date of final approval (pertaining to change in conditions or expiration date)**

DOCUMENTS SPECIFIC TO THIS DEVELOPMENT FILE:

X	X	Action Sheet			
X	X	Review Sheet Summary			
X		Development Application - 3/28/86			
X	X	Letter from Michael Sutherland to Terry Larsen, 1st Presbyterian Church re: deeds-7/7/86			
X	X	Planning Commission Minutes - ** - 4/29/86			
X		Notice of Public Hearing – 4/1/86			
X		Letter from G.W. Klapwyk, Grand Valley Water User Association to John McCallister, 1st State Bank of Hotchkiss re: inquiry pertaining to water-rights and etc. – 10/25/85			
X		Request for Treasurer's Certificate of Taxes Due – 3/31/86			
X		Commitment for Title Ins. From Lawyers Title Insurance Corporation			
X	X	List of adjacent property owners			
X		Development Schedule			
X	X	Plot Plan			
X	X	Easement between Walker Field, Public Airport Authority and 1st Presbyterian Church – Airport Critical Zone – not recorded			
X	X	Development Summary – 5/7/86			
X	X	Sub-surface Soils Investigation– 1/7/86			

APPENDIX B

PROJECT NARRATIVE

I. INTRODUCTION

The First United Presbyterian Church, a non-profit corporation, is in the process of purchasing a parcel of land at the corner of 27-1/2 Road and Cortland Avenue within the Grand Junction City limits. The parcel is 8.97 acres and is currently zoned RSF-4. This tract of land was known as Crown Heights Filing Two and was abandoned before construction began. The parcel is now owned by the First State Bank of Hotchkiss, a Colorado corporation. The First United Presbyterian Church is purchasing the property for a new church facility and has concluded that prior to final execution of the contract, it is necessary to make application and obtain the Conditional Use Permit from the City of Grand Junction for the proposed future church facility at this location.

The schedule for construction has not yet been decided upon. Allowing time for complete architectural and structural design, fund raising and contractor selection, the actual construction will not occur for at least five years from this date. As a result, the First United Presbyterian Church recognizes that any substantial changes to the proposed layout in this application may require additional review by the Grand Junction City Planning Department.

Since the final contract has not yet been signed, this Conditional Use Application is made with the current owner, the First State Bank of Hotchkiss, as the property owner. The First United Presbyterian Church will be the developer or applicant. It is requested that the Conditional Use Permit be issued to the First United Presbyterian Church, 622 White Avenue, Grand Junction, Colorado.

#15 86

II. PROPOSED CHURCH FACILITY DESCRIPTION

A. General

The proposed church facility is to be located on an 8.97 acre parcel of land located at the corner of 27-1/2 Road and Cortland Avenue within the Grand Junction City limits. The exact legal description is given in Appendix "G".

The parcel of land is currently zoned RSF-4 approved as Crown Heights Filing Two. This development was abandoned before any construction could begin and the property is currently owned by the First State Bank of Hotchkiss. The First United Presbyterian Church of Grand Junction is in the process of purchasing the property. At the present time the property is an open field with the exception of the existing house and outbuildings.

B. Proposed Facility

The proposed church facility will consist of three components: a sanctuary, a fellowship hall, and an office and classroom wing. As noted in the introduction, the architectural and structural design has not yet begun. As a result, only a layout based on the church's projected needs can be given. However, changes to the proposed layout are not expected. Since the design of the facility will incorporate passive solar construction, the facility has been oriented to take advantage of southern exposure. Although future expansion of the facility beyond that given in this application is not envisioned, the layout has been done in a manner to allow room for facility and parking lot expansion.

The footprint of the proposed church facility is 22,400 square feet. The sanctuary for worship will be 84.0 feet by 75.0 feet for a total of 6300 square feet. The fellowship hall will be 70.0 feet by 115.0 feet for a total of 8050 square feet. The fellowship hall will essentially be a large multipurpose room with kitchen facilities. The office and classroom wing will be 70.0 feet by 115.0 feet and will be designed for two stories with 8050 square feet per floor for a total of 16,100 square feet. This wing will be used for classrooms and offices for the church staff. The total proposed church facility will be 30,450 square feet.

#15 86

The design occupancy capacity for the sanctuary will be 400 persons plus an additional 200 persons in the fellowship hall and office and classroom wing at any one time for a total design occupancy of 600 persons. Maximum height of the church facility will be 32.0 feet. The facility will be designed to allow handicapped access. The type of construction for the facility has not been chosen at this time. Since the facility design has not been undertaken, no elevations of the facility are available. Elevations will be available at the time the building permit is requested. Concrete sidewalks will be provided for access to the facility. The layout for the facility is shown in the Plot Plan.

For sanitary refuse collection, the church will engage the services of a private pickup service. As a result, no location for pickup has been given.

C. Proposed Parking Lot

The overall dimensions for the proposed parking lot are 200.0 feet by 400.0 feet for a total of 80,000 square feet. The parking lot vehicle capacity will be 200 vehicles with 24 handicapped and elderly parking spaces and 176 other available parking spaces for general parking. The 24 handicapped and elderly parking spaces will be marked as such and located in the row closest to the church facility for easy access. The handicapped and elderly parking spaces will be 12.0 feet wide by 19.0 feet deep. The remaining 176 general parking spaces will be in the five remaining rows. These spaces will be 9.0 feet wide by 19.0 feet deep. Rows will be separated by a 25.0-foot wide access lane. This access lane will allow for two way circulation of traffic within the parking lot.

Three pedestrian walkways will be designated within the parking lot. These walkways will help to promote safety within the parking lot. Lighting in the parking lot will be provided by low level directional lights. The parking lot will be paved with asphalt. All parking spaces and pedestrian walkways will be striped to maintain orderly use of the parking lot. The typical details of the parking lot is shown in the Plot Plan.

D. Access Routes

Proposed access to the church facility and parking lot is two 30.0-foot wide asphalt paved access routes. These proposed routes will provide both ingress and egress.

A primary access route is proposed from 27-1/2 Road. The centerline of the 30.0-foot wide access route is 424.7 feet from the centerline of the intersection of 27-1/2 Road with Cortland Avenue. 27-1/2 Road is nearly flat for at least 1000.0 feet in both directions from the access route. This provides good sight distances in both directions. Primary use of the church facility is in the evenings and on Sunday mornings when traffic on 27-1/2 Road is fairly low. Therefore, a turn lane on 27-1/2 Road is not necessary.

A secondary 30.0-foot wide access route is proposed from Cortland Avenue. The centerline of access route is 465.0 feet from the centerline of the intersection of Cortland Avenue and 27-1/2 Road. To the east, the centerline of the proposed secondary access route is approximately 200.0 feet from the centerline of South Piazza. South Piazza is the primary access to the Crown Heights Filing One Subdivision. This access to the subdivision has low traffic volume because it is not a through street. Cortland Avenue is flat from the intersection of 27-1/2 Road for at least 1000.0 feet to the east. This will provide adequate sight distance for ingress and egress to the parking lot.

The primary and secondary access routes will provide good perimeter two way traffic to the parking lot. The access routes will be striped to maintain traffic control. A 12.0-foot wide unloading/loading lane will be provided adjacent to the church facility. Speed limit within the access routes and parking lot will be restricted to 10 mph.

E. Signs

Stop signs will be provided at the access route entrance points to 27-1/2 Road and Cortland Avenue. A lighted 8.0 foot by 8.0 foot sign near the access point from 27-1/2 Road is proposed. This sign is the primary information point for the church. It will contain information on service time, special events, and sermon title. The proposed signs are shown in the Plot Plan.

#15 86

III. UTILITIES

Electric, sewer, water and phone lines will all be underground in accordance with requirements. An 18-inch water line is available on both the south and west sides of the property. A water tap on the west side of the property closest to the church facility will be sought. A sewer line is also available on the west side of the property and is closest to the church facility. A single phase electric underground line is available on the north side of Cortland Avenue. It is anticipated a connection would be made on the east side of the secondary access route. It is planned that natural gas would be provided from a 2-inch gas line located 12.0 feet north of the south property line in Cortland Avenue.

#15 86

V. DRAINAGE

In general this parcel of land currently slopes gently to the south and west. Final drainage patterns and contours will be determined in the facility design and become part of the construction drawings used for submittal for a building permit. However, as discussed in the Subsurface Soils Report in Appendix "J", general controlling parameters are available and will be discussed in the following paragraphs.

Directly adjacent to the church facility the land surface will be graded to a five percent (5%) slope to prevent ponding of water around the structure. Basically, the asphalt paved areas used for access routes and the parking lot will be sloped two percent (2%) to allow adequate drainage. The Plot Plan shows the proposed drainage slopes, directions, and drainage ditches. The object of the proposed drainage plan is to slope surfaces to the north and south to collection ditches or channels which are sloped to the west to the property edge where collection ditches will convey runoff to a concrete drainage drop structure in the southwest corner of the property.

To be more specific, the parking lot will be crowned in the center of the lot from the east to the west so that the lot surface will be sloped two percent (2%) to the north and south from the crown. To the north the water will flow to the south side of the 27-1/2 Road access where the water will be channelized between the parking lot and the access road. Drainage from the south side of the church facility and access road will also contribute to the channel. Water will then be directed to a ditch to 27-1/2 Road and then along 27-1/2 Road to the concrete drainage drop structure. The drainage from the south side of the parking lot will flow to the edge of the parking lot and on to the adjacent revegetated area into the existing drainage ditch. The water will flow from the ditch to the 27-1/2 Road ditch and on to the concrete drainage drop structure. The remainder of the property will be sloped to drain to the north and south in sheet flow. This runoff is expected to percolate into the soil and be consumed by the vegetation.

A 12-inch diameter corrugated metal pipe will be provided to allow drainage from the Crown Heights Filing One to pass in the existing ditch on the Cortland Avenue access road. If additional culverts for drainage ditches are required at other locations, they will be sized and located in the final design and will be submitted with the plans for the building permit.

#15 88

In terms of floodplain considerations, to the best knowledge of the applicant there are no floodplain restrictions associated with this tract of land.

#15 86

VI. DRAINAGE EASEMENT REALIGNMENT

An existing 20.0-foot wide sanitary sewer and drainage easement extends from the centerline of South Seville Circle in a dogleg fashion to 27-1/2 Road. However, the current runoff drainage ditch from South Seville Circle is not in the existing easement. Also, to the applicant's knowledge none of the sanitary sewer has been placed in the easement. The sanitary sewer would have been for the abandoned Crown Heights Filing Two.

Therefore, it is proposed that the easement be realigned to follow the existing drainage ditch. The proposed realignment would be 20.0 feet wide on a bearing of N 88°30'00"E for 5435.92 feet extending from the same beginning point at 27-1/2 Road to the south edge of South Seville Circle. The dogleg would be eliminated. The dogleg in the existing easement was to accommodate street and lot alignments in the now abandoned Crown Heights Filing Two. This request for easement realignment can be seen in the Plot Plan.

#15 86

VII. LANDSCAPE PLAN

A. Philosophy

Basically, the landscape plan has been designed to meet zoning requirements while still providing a landscape which will provide reduced maintenance costs. Areas directly adjacent to the church facility will be landscaped with the more traditional lawn and planters for shrubs and flowers. The remainder of the property will utilize low maintenance native grasses. The landscaping will incorporate recommendations in the Subsurface Soils Investigation in Appendix "J". Of primary concern is the five percent (5%) of the parking lot area to be utilized in landscaping in the zoning requirements. The Soils Report discusses the problem of constructing the adequate bearing capacity with soils at the site. Therefore, landscaping within the parking lot is a problem due to any addition of water for revegation. Water would damage the parking lot subbase. Only shrub planters are proposed on the north side of the parking lot. Native grasses and trees are proposed on the perimeter of the parking lot to meet the five percent (5%) area requirement. These plans are discussed in further detail below.

B. Water Rights and Irrigation

Water rights for this property are provided by subscription to the Grand Valley Water User's Association. Water rights with this Association are identified with "acres" rather than "shares". This property has 8.9 Class I acres considered to have a water right with the Association. An enclosed letter from the Association discusses the water rights in more detail.

Water is available at the northeast corner of the property. An underground sprinkler system is proposed for the lawn areas. Small capacity ditches are proposed for trees and auxiliary uses elsewhere. The location of these ditches will be determined in the final design of the facility.

C. Landscaping Around the Church Facility

Lawn is proposed around the church facility as shown in the Plot Plan. On the south side of the facility the lawn will extend from the sidewalk to the 27-1/2 Road access route on a five percent (5%) slope to provide adequate drainage.

On the north side the lawn will extend approximately 50.0 feet from the facility on a five percent (5%) slope. To the east the lawn will extend approximately 45.0 feet on a five percent (5%) slope to a north-south line extending from the edge of the parking lot. On the west the lawn will extend approximately 50.0 feet on a five percent (5%) slope from the facility where the slope will level out to drain to 27-1/2 Road. The lawn will consume approximately 53,156 square feet or 1.22 acres for 13.6 percent of the lot area.

D. Planters

The planters on the south side of the church facility will be utilized for perennial flowers to be planted seasonally. Decorative rock or bark will also be utilized.

At the north edge of the parking lot four shrub planters are proposed. These planters will serve as an aesthetic break between the access routes and the parking lot. Decorative shrubs such as Japanese Barbary (Berberis Thunbergii) will be utilized. These shrubs will be trimmed and achieve a height of approximately 3.0 feet.

The planters adjacent to the church facility will be 3,212 square feet and the shrub planters for the parking lot will be 1908 square feet for a total of 5120 square feet. This is 0.12 acres for 1.31 percent of the total lot area. The planters are shown in the Plot Plan.

E. Existing House and Shed

Landscaping around the existing house and shed will remain as it currently exists. As shown on the Plot Plan, a number of mature ~~Elm~~ Cottonwood trees exist but little else. Native grasses discussed below will be planted when landscape work is undertaken.

F. Remaining Areas

The remaining area on the property, approximately 175,417 square feet or 4.03 acres comprising approximately 45 percent of the lot area, will be planted with native grasses and trees. This is shown in the Plot Plan.

Due to the large area, native grasses have been chosen because their ability to sustain themselves with available rainfall. This will

#15 86

reduce maintenance while providing sediment control and good ground cover. Following is a tabulation of the proposed seed mixture:

Common Name	Botanical Name	Lbs./Acre in Pure Live Seed
Western Wheatgrass	Agropyronsmithii	4.0
Sideoats Gramma	Bouteloua Cutripendula	3.0
Buffalo Grass	Buchloe Dactgloides	6.0
Blue Gramma	Bouteloua Gracilas	3.0
	Total	16.0

These grasses are annuals and do not require replanting each year. Further, if desired, they may be watered and mowed to provide another advantage.

To provide screening on the east and south sides trees will be planted on at least 100-foot centers. The approximate location is shown in the Plot Plan. Varieties proposed are either Russian Olive (Eleagnaceae Angustifolia) or Green Ash (Fraxinus Glabrus). The trees will be purchased from a local nursery and will be planted after the native grasses have become established. This is normally one growing season.

G. Fence Variance

Grand Junction zoning requires a fence between adjacent uses to provide screening. Existing residences on the east side which are adjacent to the property already have fences. Also, the property to the north is currently an orchard. Due to the distances from the facilities to the residence lots and the proposed trees, it is felt that an additional fence is not necessary. Therefore, a variance is requested from the zoning regulations and the First United Presbyterian Church be allowed to not place any fences on the east and north perimeters of the property.

#15 86

VIII. EXISTING HOUSE AND SHED

An existing two-story frame house with a partial basement of 865 square feet on the main floor and 400 square feet upstairs, a shed of 1680 square feet using frame construction used for storage and equipment, and an 11.0-foot diameter tank is located in the northwest corner of the property. Currently, the house and shed is rented to the previous owner of the orchard. The house is vacant but is used as a sales outlet for agricultural products--primarily peaches and apples in the fall. The 11.0-foot diameter tank was used for fuel storage in the past. Fuel storage in the tank will be discontinued. At this time it is anticipated that this house and shed will continue to be utilized as a rental property.

The existing driveway is not located on the tract of land that the First United Presbyterian Church is in the process of purchasing. At such time the existing driveway on the north side of the house and shed is no longer available, a 15.0-foot wide gravel driveway on the south side of the house is proposed. As a result, the construction schedule for this low traffic volume driveway has not been determined.

#15 86

IX. DEVELOPMENT SCHEDULE

The First United Presbyterian Church is in the process of purchasing this property and has concluded that prior to final execution of the contract, it is necessary to make application and obtain the Conditional Use Permit from the City of Grand Junction for a proposed church facility at this location. As a result, final architectural and structural design has not yet begun. Allowing time for design, fund raising and contractor selection, the actual construction will not occur for at least five years from this date. It is recognized that any substantial changes to layout in this application may require additional review by the Grand Junction Planning Department.

#15 86

X. AREA SUMMARY

Description	AREA Sq. Ft.	AREA Acres	Percent of Total Area
Church facility	22,400	0.514	5.73
Concrete sidewalks	5,120	0.118	1.31
Paved parking lot	76,788	1.763	19.65
Paved access routes	24,456	0.561	6.26
Existing house & shed (including grounds & proposed driveway)	17,325	0.398	4.43
Proposed sanitary sewer & drainage easement realignment	10,918	0.251	2.79
Planter areas	5,120	0.118	1.31
Lawn area	53,156	1.220	13.60
Native grass areas	175,417	4.027	44.89
TOTAL LOT AREA	390,700	8.970	99.97

#15 86

Lloyd E. Unfred
2312 So. Seville Cr.
Grand Junction, Co. 81506

First State Bank of Hotch

Onion Hill Ltd.
P.O. Box 2188
Grand Junction, Co. 81502

First State Bank of
Hotchkiss
PO Box 38
Hotchkiss, CO 81419

Equity Management Inc.
2420 W. 26th Ave.
Denver, Co. 80211

First United Presbyterian
Church
622 White Ave.
Grand Junction, CO 81501

Larry A. Gelhaar
2256 So. Seville Cr.
Grand Junction, Co. 81506

Terry Larson
357 Music Lane
Grand Junction, CO 81501

Richard J. Krzsiaa
3943 So. Piazza
Grand Junction, Co. 81506

Henry Johnson, Jr.
2285 S. Seville Cr.
Grand Junction, Co. 81506

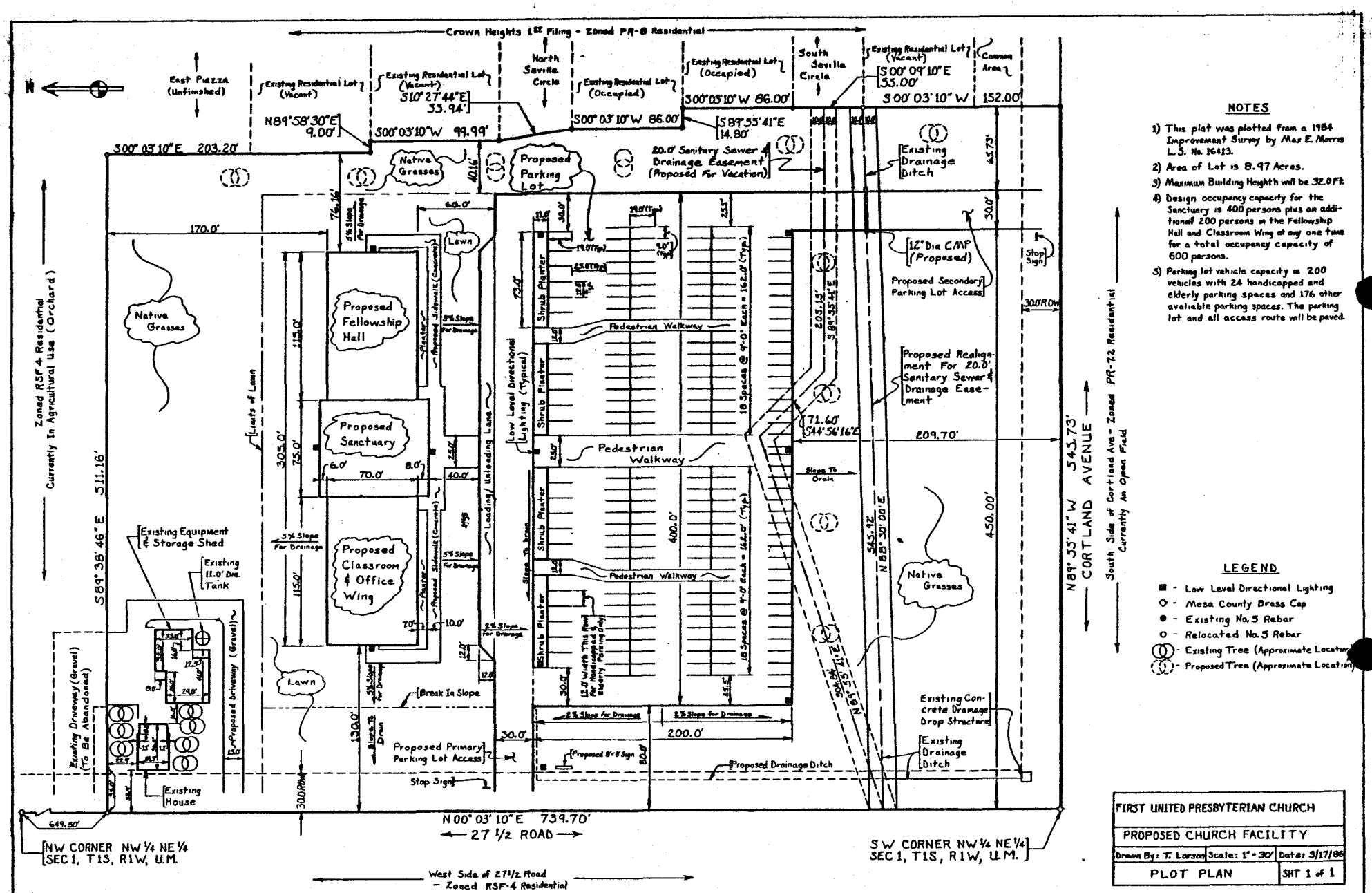
The Andrew H. Christensen Fam.
2669 Paradise Dr.
Grand Junction, Co. 81506

Earl H. Davis
P.O. Box 2783
Grand Junction, Co. 81502

Emanuel Epstein
1900 Quinton Rd.
Brooklyn, N.Y. 11229

Jimmie L. Etter
697 27½ Rd.
Grand Junction, Co. 81501

#15 86



NOTES

1) This plat was plotted from a 1984 Improvement Survey by Max E. Morris L.S. No. 16413.
2) Area of Lot is 8.97 Acres.
3) Maximum Building Heighth will be 32.0 Ft.
4) Design occupancy capacity for the Sanctuary is 400 persons plus an additional 200 persons in the Fellowship Hall and Classroom Wing at any one time for a total occupancy capacity of 600 persons.
5) Parking lot vehicle capacity is 200 vehicles with 24 handicapped and elderly parking spaces and 176 other available parking spaces. The parking lot and all access route will be paved.

LEGEND

- ■ - Low Level Directional Lighting
- ◇ - Mesa County Brass Cap
- ● - Existing No. 5 Rebar
- ○ - Relocated No. 5 Rebar
- ◯ - Existing Tree (Approximate Location)
- (◯) - Proposed Tree (Approximate Location)

FIRST UNITED PRESBYTERIAN CHURCH		
PROPOSED CHURCH FACILITY		
Drawn By: T. Larson	Scale: 1" = 30'	Date: 3/17/86
PLOT PLAN		SHT 1 of 1

SI #15

ALL Property Owners Within 100 ft. of the Proptery Lines At 27½ Rd and Cortlandt.

Tax #	OWNER OF RECORD	ADDRESS
2945-011-00-101	LLoyd E. UNFRED	2312 So. Seville CR. GRAND Jct Co 81506
2945-011-00-035	ONION HILL Ltd.	P.O. BOX 2188 GRAND Jct, Co. 81502
2945-011-41-001	LLoyd E. UNFRED	(SAME As Above)
2945-011-38-001	EQUITY MANAGEMENT INC.	2420 W. 26th Ave. Denver, Co 80211
2945-011-38-002	" " "	" "
2945-011-39-001	LARRY A. GeLHAAR	2256 So. Seville CR. Gnd. Jct, Co 81506
2945-011-39-002	RICHARD J. KRZSIAA	3943 So. PIAZZA G.J. 8150
2945-011-36-001	HENRY JOHNSON, JR.	2285 S. Seville CR. Gnd. Jct, Co 81506
2945-011-36-017	EQUITY MGMT. INC.	(AS Above)
2945-011-36-018	" " "	" "
2945-011-37-001	" " "	" "
2945-011-37-010	" " "	" "
2945-011-40-001	" " "	" "
2945-011-40-002	LLoyd E. UNFRED	" "
2945-012-00-011	THE ANDREW H. CHRISTENSEN FAMILY	2669 PARADISE DR. GRAND Jct, Co 81506
2945-012-00-033	EARL H. DAVIS	P.O. BOX 2783 Grnd Jct, Co 81502
2945-012-00-052	" " "	" " "
2945-012-00-053	" " "	" " "
2945-012-00-073	EMANUEL EPSTGIN	1900 Quinton Rd. BROOKLYN, N.Y. 11229
2945-012-00-074	JIMMIE L. ETTER	697 27½ Rd. Gnd. Jct, Co 81501

#15 86

#15-87

EXHIBIT A

THIS EASEMENT is made and entered into by and between the WALKER FIELD, COLORADO, PUBLIC AIRPORT AUTHORITY, a body corporate and politic and constituting a political subdivision of the State of Colorado, hereinafter called GRANTEE, and First United Presbyterian Church of Grand Junction hereinafter, GRANTOR;

WHEREAS, Grantee is the owner and operator of Walker Field Airport situated in the County of Mesa, State of Colorado, and in close proximity to the land of Grantor, and Grantee desires to obtain and preserve for the use and benefit of the public a right of free and unobstructed flight for aircraft landing upon, taking off from, or maneuvering about said airport; and

WHEREAS, Grantor is the owner in fee simple of that certain parcel of land situated in the County of Mesa, State of Colorado, to wit:

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration, the receipt of which is hereby acknowledged, the Grantor, for himself, his heirs, administrators, executors, successors and assigns, does hereby grant, bargain, sell and convey unto the Grantee, its successors and assigns, for the use and benefit of the public, an easement and right of way appurtenant to Walker Field Airport, for the passage of all aircraft ("aircraft" being defined for the purposes of this instrument as any device known or hereafter invented, used or designed for navigation or flight in the air) by whomsoever owned and operated, in the navigable airspace above the surface of Grantor's Property to an infinite height above said Grantor's property, together with the right to cause in said airspace such noise and vibrations, smoke, fumes, glare, dust, fuel particles and all other effects that may be caused by the normal operation of aircraft landing at or taking off from or operating at or on said Walker Field Airport, and Grantor hereby waives, remises and releases any right or cause of action which Grantor now has or which Grantor may have in the future against Grantee, its successors and assigns, due to such noise, vibrations, smoke, fumes, glare, dust, fuel particles caused by the normal operation of such aircraft.

FURTHER, Grantor hereby covenants, for and during the life of this easement, that Grantor:

(a) shall not hereafter construct, permit or suffer to maintain upon said land any obstruction that extends into navigable airspace required for use of said airport runway surfaces; (Navigable airspace is defined for the purpose of this instrument as airspace at and above the minimum flight altitudes, including take off and landing, as prescribed in Federal Aviation Administration Federal Air Regulations Part 91, and as such regulations are amended.)

(b) shall not hereafter use or permit or suffer use of said land in such a manner as to create electrical or electronic interference with radio communication or radar operation between the installation upon Walker Field Airport and aircraft, or to make it difficult for flyers to distinguish between airport lights and others or to result in glare in the eyes of flyers using the said airport, or to impair visibility in the vicinity of the airport, or otherwise to endanger the landing, taking off or maneuvering or aircraft.

Grantor agrees the aforesaid covenants and agreements shall run with the land for the benefit of Grantee, its successors and assigns, until said airport shall be abandoned and shall cease to be used for public airport purposes.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal on this 31st day of March, A.D. 1986.

E. A. Mallory
Pres.

STATE OF COLORADO)
) ss:
COUNTY OF MESA)

The foregoing instrument was acknowledged before me this 31st day of March, A.D. 1986, by E. A. Mallory.

My Commission expires: Aug. 12, 1988.

Sarah K. Cook
Notary Public
536 Burray Grand Junction Co

PETROS CONSULTING

~~303 HILLVIEW DRIVE~~ 2065 N. 15 St.
GRAND JUNCTION, CO ~~81503~~ 81501
303-243-2493

• WELL SITE GEOLOGY
• GEOTECHNICAL GEOLOGY

January 7, 1986

FIRST UNITED PRESBYTERIAN CHURCH
622 White Avenue
Grand Junction
Colorado

SUBSURFACE SOILS
INVESTIGATION
27½ Road & Cortland Ave.
Grand Junction
Colorado

Attn: Mr. Terry Larson

Dear Sir:

Enclosed herewith is the results of a Subsurface Soils Investigation conducted on the tract of the proposed Church Structure. This report provides overall site information and foundation recommendations for a medium to large structure. As the precise building location has yet to be determined and the structure has not been designed, this report cannot deal with the actual foundation design; but it does provide sufficient information for planning and preliminary design.

It is necessary that we be notified once you have selected a final building design. We can then review the building design and make our final foundation recommendations.

It is also necessary that Mr. Morris be present during construction of the foundation to verify the soil characteristics and to observe the construction activity. By doing this he can verify that the foundation is constructed according to the recommendations contained in this report or

#15 86

according to any field changes that might be necessary.

Respectfully submitted,
PETROS CONSULTING

Thomas P. Beck, Jr.
P.E. Colorado 16096

Edward M. Morris

EMM/em

THOMAS P. BECK JR. REGISTERED PROFESSIONAL ENGINEER 16096 STATE OF COLORADO

#15 86

GENERAL

Personnel of PETROS CONSULTING have completed a subsurface soils investigation of a site located at the intersection of Cortland Avenue and 27½ Road. The purpose of the study is to determine the subsurface soils characteristics for use in the design and construction of a medium-weight church structure. It is not known at this time if the structure is to be multistory or will contain a basement. The type of construction is not known, and this report will contain recommendations of a general nature addressing several construction possibilities.

This report is limited to the general total site investigation and is further limited due to a lack of specific plans and selected building site.

The tract contains approximately 9 acres located in the Northeast corner of the intersection of Cortland Avenue and 27½ Road. The site is more accurately described as a portion of the NW¼, NE¼ Sec 1, T1S, R1E of the Ute Meridian. The Crown Heights Subdivision provides the East boundry.

The site has historically been utilized for agriculture and specifically as an orchard. Small irrigation ditches are present on and around the site; however, most of these ditches are not being utilized due to land development and the removal of the orchard. The unlined Government Highline Canal runs Northeast of the tract and provides most of the area subsurface waters. The general drainage is toward the South and West for both surface and subsurface waters. The surface drainage is poor, and the subsurface drainage is fair to poor. The tract is not within any designated floodplain or flood-prone area, and no evidence of recent flooding is found or suspected on this tract.

The topography is flat, gently sloping to the Southwest, graded for agriculture purposes and quite nonimpressive.

The general area is quite high and surrounded by well-defined drainageways.

A previous subsurface investigation of this general area was performed by Western Engineers, dated July 28, 1980 and addressed to Bob Coburn of Coburn Engineers. The requested work was very limited in scope, and the stated conclusions were very general. The conclusions were based on the anticipated construction of light-weight, single-family residential structures. This report, by PETROS CONSULTING, assumes a heavier, less flexible type of construction resulting in lower soil-bearing capacities than stated in the Western Engineers report.

As the precise building location has yet to be determined and the structure has not yet been designed, this report cannot deal with the actual foundation design but does provide sufficient information for planning and preliminary design.

GEOLOGY

The entire tract is underlain by the hard shales of the Mancos Formation. The Mancos Formation is considered to be bedrock for this portion of the valley. The Mancos Formation is quite thick and does not exhibit complicated structure in this area. The formation dips toward the northeast at a gentle angle of 4 to 15 degrees. The Grand Junction area is located between 3 primary structural features; the Uncompahgre Uplift, to the southwest, the Piceance Creek basin to the northeast and the Green River basin to the northwest. The area structure has a profound effect on the present conditions of the valley. The development of the Colorado River Valley within the structural framework, produced the Bookcliffs, which have been and continue to be a source of small to medium sized mudflows. The activity of these mudflows has been greatly diminished for several hundred or even thousand years. These mudflows have provided the majority of the surface soils in the Grand Junction area and have essentially pushed the Colorado River to the southern part of the valley. The surface soils on this site are of mudflow origins and have not been reworked by flooding action of the Colorado River. These surface soils cover an ancient terrace deposit of the Colorado River.

The depth to bedrock, Mancos Shale, is 18 to 24 feet. The Mancos Shale is characterized as containing clays which expand upon the addition of water and shrink when dried. This characteristic can have a profound effect on any foundations which come into contact with this formation, and any such foundations must be specifically designed to withstand these movements. If a deep foundation, such as driven piles or drilled piers are used, the expansive characteristics of the Mancos Shale must be taken into account.

The surface soils and the lower mudflow horizons are a complicated sequence of clays, silts, silty clays and sands.

Inspection of the test logs indicates the complexity of the deposits. These deposits range from 5½ to 11 feet thick. These deposits have not been consolidated, and the large amounts of former irrigation waters contribute to a low density and soft soils condition.

Beneath the mudflow horizon is an 11 to 17-foot thick sand and gravel deposit which contains cobbles in the lower portion. This deposit was placed by action of the ancient Colorado River and appears to be a portion of the oldest remaining deposits of the Colorado River. These deposits can be used for foundation support if certain precautions are taken.

GENERAL SURFACE SOILS

Eight test pits were placed on this tract and were used to determine the specific Engineering Characteristics of the soils. Samples were taken using Bulk methods and Shelby Tubes. The information obtained was consistant with previous work in the area, and the data is likely to be representative of the entire tract; however, individual structures should be inspected to insure that proper bearing materials have been reached in the excavations.

The soils were found to be alluvial/mudflow in origin and were also found to be very soft and compressible. The deeper soils were also soft until the buried gravels and cobbles were reached. These cobbles and gravels are capable of supporting any anticipated heavy loads without appreciable settlement.

The tracts have been used for various agricultural purposes which generally included onsite irrigation. The surface soils have been extensively reworked by the agricultural activity and are quite soft and of low density. The natural water table is quite consistant across the site and ranges from 9 to 11 feet below the ground surface. This high water table should be considered as a permanent feature of the site. The general flow of the subsurface waters is south, toward the Colorado River.

Due to desiccation of the surface soils, a crust will form over the softer soils, and the soils will take on the appearance of being quite strong and capable of supporting loads. This condition is illusionary unless measures are taken to physically increase the density of the soil layer. As the soils dry, the preexisting soil structure is maintained. That is, the voids in the soil still exist. If the soils become saturated or even wetted significantly, the soils become soft and compressible.

The surface soils exhibit extensive vertical "piping" due to intensive irrigation. This "piping" has removed a significant percentage of the soil leaving a compressible condi-

tion when overloaded or wetted when loaded. This condition is a variety of hydrocompaction and requires either foundations totally penetrating the affected soils or the soils removed. The replacement can be with new properly compacted soils or gravels or by using the original soils which are carefully compacted and protected from future "piping"

Parking areas and driveways will require specific stabilization for long-term protection. Massive soil recompaction and/or using a Geotextile are common methods of protection.

TESTING AND CONCLUSIONS

Soil Type #1 is a lean clay, CL using the Unified Classification System, and is typical of all the surface soils found on this site. This soil type is sometimes found at depth in the soil profile. This clay is fine grained, of low plasticity and is generally found in a low density condition. These soils have a destinct tendency to consolidate if the Maximum Allowable Bearing Capacity is exceeded; however, the rate of consolidation can be quite slow. The surface soils tend to contain varying amounts of organic material which is not considered as suitable for foundation bearing soils. In the present condition these soils exhibit a Maximum Allowable Bearing capacity of 600 psf. A minimum Bearing of 200 psf is required beneath all structural portions founded on these soils because if compacted, these clays will tend to swell a small amount. These soils contain sulfates in quantities sufficient to react with concrete and certain metal products. More detailed information will be found on the Soil Analysis Sheets found at the end of this report.

Soil Type #2 is a lean clay and silt combination, a CL-ML using the Unified Classification System. These soils are typical of the mudflow deposits found throughout the valley. These soils are found in a low density and usually high moisture condition. These soils are slightly plastic and are soft. Consolidation of these soils will be a problem if the maximum Allowable Bearing is exceeded. These soils tend to require several years for consolidation to become apparent, and this time lag tends to give a false sense of security. In the present condition, these soils exhibit a Maximum Allowable Bearing Capacity of 700 psf, assuming at least 2 feet of confinement is provided for these soils. If these soils are compacted, some increase of Bearing Capacity can be expected; but each case must be evaluated based on the individual merits. These soils do contain large amounts of Sulfates, and protection is required.

Soil Type #3 is a low plastic silt, an ML using the Unified Classification System. This soil is very fine grained and tends to be of low density on this tract. These soils tend to consolidate fairly quickly when overloaded and exhibit very low shearing strengths. When found below the water table, these soils often flow into excavations and proved to be a hindrence during the field investgiation for this report. These soils exhibit a Maximum Allowable Bearing Capacity of 600 psf in the natural conditions and tend to make a very poor foundation soil.

Soil Type #4 is estimated to be a gravel, silt and sand mixture, a GM/ML/SM by the Unified Classification system. This soil was only found beneath the mudflow deposit, immediately above the gravels and cobbles of the ancient Colorado River Terrace. This soil appears to be of medium density, plastic and medium graded. The thickness of this deposit appears to be limited to only 2 to 4 feet, grading into the cleaner gravels. This soil should be penetrated by any deep foundation system and not be used for a bearing strata.

Soil Type #5 is fairly clean, silty, sandy gravel and cobble sequence which is quite stratified. This soil is classified as a GM/GP using the Unified Classification System. The fines of this deposit are nonplastic; however, isolated lenses of clayey soils are present. This deposit is of medium to high density and exhibits a maximum Allowable Bearing Capacity of 7000 psf; and due to the near proximity of the expansive Mancos Shales, a minimum bearing of 2000 psf is required. These values assume an extended footing or gravel pad bearing on these gravels. Due to the stratification of these soils and the possibility of thin, softer layers within the deposit, it is recommended that any driven piles, if used, be continued to the underlying Mancos Shale, so that little question can be raised regarding the integrity of the bearing strata. If driven piles are used, they should be driven to effective refusal, which with steel piles, an effective bearing of 70,000 to 140,000 psf is reasonable. Effective

refusal of driven piles should penetrate this soil horizon.

Soil Type #6 is the clay of the Mancos Shale. These clays are plastic, of high density and expansive. The Unified Classification System would generally rate these as a CL. Some zones of the formation are sandy and/or silty; but generally the basic characteristics, as related to this project, are as follows: The Mancos Shale is very dense and expansive. The Maximum Allowable Bearing Capacity can be taken as 160,000 psf for driven piles with a minimum 2-foot socket, driven to practical refusal and a minimum bearing of 20,000 psf is required at all times. For drilled piers, 60,000 psf Maximum and 20,000 Minimum Bearing can be assumed, assuming the drilling operation is inspected to insure that all piers end on a proper bearing strata. For any deep foundation, field inspection is required to insure that proper placement and sufficient penetration is achieved.

Free water was encountered in all borings and test pits and must be considered to be a permanent feature of this site. It is anticipated that the Water Level may rise a foot or two after the area is brought under development and irrigation is resumed for landscaping and surrounding ditches are placed in conduits or lined. The presence of the free water will have a definite effect on the installation of utilities and foundations and will present some problems regarding the design and construction of the roads and other paved areas.

The yearly fluctuation of the ground water level is anticipated to be 2 feet, based on this investigation during the late fall months and some previous test borings placed in the late spring, during the normal irrigation season. This level takes into account a reasonable amount of onsite irrigation after development. The effective high ground water level is anticipated to be between 7 to 9 feet below the existing ground level at the time of this investigation.

CONCLUSIONS AND RECOMMENDATIONS

The soft surface soils on this site present several problems for the construction anticipated. The soils are not capable of supporting a medium-weight structure without unacceptable differential settlement. In addition, concrete slabs on grade and surface pavements will be subject to movement.

The heavy structure foundation will require either a controlled fill beneath the building or a deep foundation consisting of either driven piles or drilled piers. Generally speaking, the deeper foundation is the preferred system for this site; and if founded on Soil Type #5, it will require predrilling most of the actual building site to insure that softer or unstable sand, silt or clay zones are completely penetrated by the piles or piers. Founding the piles or piers in the Mancos Shale, soil Type #6 will require enough site specific drilling to estimate the depth to shale so that adequate driving or drilling will be accomplished. This foundation system is further discussed in the next section of this report.

The structure can be founded on a controlled fill, which involves the removal of much or all of soil Types #1,2,3 and 4, depending on the actual requirements of the chosen structure. If a half basement is incorporated into the structure plan, the amount of fill brought back can be minimized without jeopardizing the foundation integrity. The major limitation is the groundwater level which will add to the excavation and fill costs and place a lower limit on the floor elevation.

Another potential problem is the existance of sand, silt or clay zones in soil Type #5 which are compressible and may cause some differential settlement of the fill and foundation system. A light-weight structure will probably not be seriously or even noticably affected by relatively thin compressible zones, but a heavier structure could be adversely affected. Specific site drilling could investigate the risks involved.

The controlled fill should be accomplished in the following manner: Based on presumed building loads, a width and thickness of native soil is removed preferably down to soil Type #5 and is replaced with a coarse, granular, nonplastic material placed in 6 to 8-inch maximum lifts and compacted to a minimum of 95% of maximum density, ASTM-D-698. The design thickness of this fill will depend on the actual fill material used, actual building loads and the degree of building/foundation rigidity desired. The design of the structural fill should be such that a dimension equal to a minimum of two times the width of the footing or the footing/pad equivalent is provided beneath the footing or pad. The fill should extend laterally around all foundation components at least one-half times the footing width. For example, a two-foot wide footing would require a four-foot wide fill; a three-foot wide footing would require a six-foot wide fill.

A construction procedure recommended is that once the excavation has been completed and inspected, the native soils be scarified and compacted to at least 95% of its maximum Proctor Density, ASTM-D-698. Coarse-grained, imported fill could then be placed, in lifts not to exceed 6 inches in compacted thickness. The coarse-grained soil should be placed at approximately its Proctor Optimum Moisture $\pm$2% and be compacted to at least 95% of the Maximum Proctor Density, ASTM-D-698. The fill should now be inspected and tested for conformity. If the soils are prepared in the above manner, then design pressures on the order of 2100 to 4700 psf maximum could be achieved. It is very important that the final fill be inspected and the final Maximum Allowable Bearing Capacity of the Fill be confirmed. Foundations designed on the basis of this confirmed bearing capacity would be used to determine the proportioning of the footing width, fill width and depth.

The actual maximum bearing capacity will depend on what soil is beneath the compacted fill, what fill material is used and the degree of uniformity of native soils and compacted fill across the site. A detailed building elevation and structural plan is required before more concise maximum soil bearing capacities can be determined. It must be noted that varying soil densities or soil types beneath the compacted fill will have an affect on the foundation system; and the magnitude of these affects cannot be evaluated at this time. More precise development and structural information is required.

RECOMMENDATIONS FOR DEEP FOUNDATIONS

Due to the existance of the soft, low density soils, it is recommended that a deep foundation system be used to carry the structual weight of the heavier buildings proposed for this site. A deep system could either be of driven piles or drilled piers (caissons). This foundation system would carry the weight of the proposed structures and would extend through the overlying soft soils and into the firm gravels and/or Mancos Shale Formation. Driven piles and drilled piers each have numerous advantages and disadvantages with respect to this site and the actual proposed structures. Therefore, the decision as to which foundation system is used is largely economic and will be left for the owner or his representative.

DRIVEN PILES

The piles should be driven to bear on the underlying firm gravel and/or Mancos Formation. Specific recommendations regarding pile type and capacity cannot be made in a report of this nature. Several guidelines can be given; for example, a pile driven with a hammer having a rated energy of 15,000 ft-lbs per blow, to a resistance of 6 to 10 blows per inch, should develop a capacity of 60 to 80 tons. Actual capacities should be determined when driving operations commence using a pile load test or by approximate means using a suitable pile driving equation.

Piles should be used in groups to provide for eccentricities in loading and the group capacity will be less than the summation of the individual pile capacities. The relative spacing of the piles determine the amount of capacity reduction; however, a conservative estimate would be on the order of 2/3 of the summation of the single pile capacities.

Horizonal loads may be present in the foundations of some building types. These horizonal loads can be quite high in some types of metal structures and can be very minor in conventional buildings. Any horizonal loads must be properly accounted

for and the use of internal structural support in the building or batter piles are usually acceptable. The use of Hairpins in the floor slabs is very seldom acceptable.

Minimum spacing between the piles should be twice the average pile diameter or 1.75 times the diagonal pile cross section, but no less than 24 inches. The tops of the piles should extend no less than 4 inches into the pile cap. No pile should be less than 10 feet long. Vertical piles are available for use. Typically timber, steel and concrete piles are used and each is associated with a number of advantages and disadvantages.

Generally steel and concrete piles are used in the Grand Junction area. Steel piles are easy to splice, making them suitable on a site where the final driving depth is not accurately known. Steel piles are usually suitable for design loads on the order of 40 to 120 tons. Concrete piles are precast and somewhat difficult to splice; however, they can be manufactured to meet a wide range of design modes.

The foundation system will require a reinforced, concrete gradebeam to carry the exterior wall loads. Some types of construction utilizing concrete tiltup walls or possibly metal walls may not require this gradebeam, but each case must be evaluated to determine the requirements of the structure and the stability of the piles. The gradebeam should be designed to extend from bearing point to bearing point and not rest on the ground. In the case of very long spans, the gradebeam could be allowed to only span half the distance with some load transfer being allowed near midspan; however, the limitations of the allowable soil bearing capacity and potential settlement must be recognized. In all cases, the reinforcing should be horizonal and continuous around the structure, with no gaps or breaks unless they are specifically designed. Beams should be reinforced at the top and the bottom with major reinforcement being placed in the bottom of the beam.

Unless specifically designed as a structural slab, all concrete slabs on grade must be free and separate from the founda-

tion portions of the structure. The slab must be allowed to move up and down within the foundation. The slabs should contain deep construction or contraction joints to facilitate even breakage which could result from differential movement or normal slab movements. Slabs should be placed in sections no greater than 20 to 25 feet on a side, depending on the consistancy of the placed concrete. The slabs should not rest on any existing top-soil, organic or uncontrolled fill materials. Any such materials should be removed from the building area and replaced with a properly compacted fill of approved material.

A recommended procedure is that once the material removal has been completed and inspected, the native soils must be scarified and compacted to at least 95% of its maximum Proctor Density, ASTM-D-698. Coarse-grained, imported fill could then be placed, in lifts not to exceed 6 inches in compacted thickness. The coarse-grained soil should be placed at approximately its Proctor Optimum Moisture ±2% and be compacted to at least 95% of the Maximum Proctor Density, ASTM-D-698. The fill should now be inspected and tested for conformity.

DRILLED PIERS

The use of drilled piers on this site is possible; however, the difficulty with soft, caving soils and the high groundwater level will complicate the installation of the piers and will require the use of casing and dewatering procedures for construction. Piers should extend a minimum of 6 feet into the coarse gravel and cobble deposit or 4 feet into the Mancos Formation. At this penetration into the gravel and cobbles the maximum allowable bearing capacity may be taken as 7000 psf and a minimum bearing of 2000 psf should be maintained. These values are for endbearing only. The maximum allowable side friction may be taken as 1200 psf for that portion of the shaft in soil Type #5.

If the piers are founded in the Mancos Formation, the allowable end bearing capacity may be taken as 60,000 psf with a

minimum bearing of 20,000 psf. These values take into account side friction and assume a penetration of 4 feet into the Mancos Formation. If the penetration is different, the following values should be maintained. These values apply only to that portion of the pier which is within the Mancos Formation.

More recommendations for drilled piers can be presented, if desired; however, construction problems associated with the soft soils and the high groundwater level does not make this system very attractive.

Due to the low density and wet characteristics of the overlying soils, a potential exists for the occurrence of a phenomenon known as negative skin friction. This will affect both drilled piers and driven piles. The actual degree of potential depends on the manner of pile or pier installation, the future ground water conditions and future vibratory or static loads in the area. We do not feel that the potential negative skin friction is likely to exceed a value on the order of 100 psf, acting on the perimeter of the pile or pier. In this area, the affected area is the drier "crust" at the top of the soil profile, generally 2 to 5 feet in thickness. The occurrence of negative skin friction, to a measurable amount, is not anticipated on this site, but is possible.