Table of Contents

: SPR-1995-060

Date 8/3/99

Present	Scanned	
		A few items are denoted with a (*) are to be scanned for permanent record on the ISYS retrieval system. In some instances, not all entries designated to be scanned, are present in the file. There are also documents specific to certain files, not found on the standard list. For this reason, a checklist has been included. Remaining items, (not selected for scanning), will be marked present on the checklist. This index can serve as a quick guide for the contents of each file. Files denoted with (**) are to be located using the ISYS Query System. Planning Clearance will need to be typed in full, as well as other entries such as Ordinances, Resolutions, Board of Appeals, and etc.
X	X	***Summary Sheet – Table of Contents**
		Application form
		Receipts for fees paid for anything
X	X	***Submittal checklist – Change of Use Review**
X	X	***General project report**
		Reduced copy of final plans or drawings
		Reduction of assessor's map
		Evidence of title, deeds
		***Mailing list**
		Public notice cards
		Record of certified mail
		Legal description
		Appraisal of raw land
		Reduction of any maps – final copy
	X	***Final reports for drainage and soils (geotechnical reports)**
		Other bound or nonbound reports
		Traffic studies
X		Individual review comments from agencies
X	X	***Consolidated review comments list**
		***Petitioner's response to comments**
X	X	***Staff Reports – Board of Appeals**
		***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		Letter to Louis R. Brach from Michael Drollinger re: Final Inspection of 411 Brach Drive– 8/31/95			Planning Clearance - **
X	X	Grading, Landscaping & Site Plan - revised			Letter of Transmittal from Michael Drollinger to Bob Turner, Alco Bldg. Co., Inc.
X	X	Krabacher Assoc. – Brach Storage Hydrology	X	X	PLAT OF PIONEER VILLAGE SOUTH
X		Request for release of deed of trust and release			
X		Warranty Deed			
X		Letter to Dan Wilson from Dave Brach – 4/18/95			
X		Letter from Louis Brach to Comm. Dev. – 4/10/95			
X	X	Document from Krabacher – Grading and drainage calculations required by the City of Grand Junction for/and prior to obtaining a building permit			
		Memo to Michael Drollinger and Jody Kliska from Alco Bldg. Co. – 4/3/95 re: Items addressed and revised on current plan			
X		Letter from Dave Brach to Dan Wilson – 4/18/95			
X		Letter to Robert Turner from Michael Drollinger – 4/3/95			
X	X	Letter from Michael Drollinger to Bob Turner – 4/21/95			

SUBMITTAL CHECKLIST

SITE PLAN REVIEW

Location: #1 Monument Road   Project Name: Mini-storage

SPR-95-60
Receipt #2179
Amt - $155.00

ITEMS: DESCRIPTION	SSID REFERENCE	● City Community Development	● City Dev. Eng.	● City Utility Eng.	● City Property Agent	● City Parks/Recreation	● City Fire Department	● City Attorney	○ City Downtown Dev. Auth.	○ County Planning	● County Bldg. Dept.	● Irrigation District	● Drainage District	● Water District (Redlands)	○ Sewer District	○ U.S. West	○ Public Service	○ GVRP	○ CDOT	○ Corps of Engineers	○ Walker Field	TOTAL REQ'D.
● Application Fee $100 + $15/acre	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	
● 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	
● Evidence of Title	VII-2	1			1			1														
○ Appraisal of Raw Land	VII-1	1			1	1																
○ Deeds	VII-1	1			1			1														
○ Easements	VII-2	1	1	1	1			1														
○ Avigation Easement	VII-1	1			1			1														
○ ROW	VII-3	1	1	1	1			1														
○ Improvements Agreement/Guarantee	VII-2	1	1	1				1														
○ CDOT Access Permit	VII-3	1	1																			
○ 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	
○ Elevation Drawing	IX-13	1	1																			
● Site Plan	IX-29	2	2	1	1																	
● 11"x17" Reduction of Site Plan or full size	IX-29					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		
○ Phase I and II Environmental Report	X-10,11	1	1																			
○ Traffic Impact Study	X-15	1	2																1			

NOTES:
1) An asterisk in the item description column indicates that a form is supplied by the City.
2) Required submittal items and distribution are indicated by filled in circles, some of which may be filled in during the pre-application conference. Additional items or copies may be subsequently requested in the review process.
3) Each submitted item must be labeled, named, or otherwise identified as described above in the description column.

DRAWING STANDARDS CHECKLIST

SITE PLAN

SECTION VIII	ITEM	GRAPHIC STANDARDS	OK	NA
	A	Scale: 1" = 10', 20', 30', 40', or 50'		
	B	Drawing size: 24" x 36"		
	C	Primary features consist only of proposed facilities except those related to drainage		
	D	Notation: All non-construction text, and also construction notation for all primary features		
	E	Line weights of existing and proposed (secondary and primary) features per City standards		
	F	Location: All primary facilities are fully located horizontally (See Comment 1)		
	I	Orientation and north arrow		
	J	Stamped and sealed drawings by registered professional competent in the work		
	K	Title block with names, titles, preparation and revision dates		
	L	Reference to City Standard Drawings and Specifications		
	M	Legend of symbols used		
	N	List of abbreviations used		
	P	Multiple sheets provided with overall graphical key and match lines		
	R	Neatness and legibility		

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

COMMENTS

1 All angle, curvature, tangency, grade break and change, and other primary features must be fully located horizontally. However, these may be identified on the Grading and Drainage Plan, or may be put on a separate "Staking Plan".

2 If the scale is 1" = 10' or 20', instead of preparing a separate Landscaping Plan, that information may be provided hereon if it will not be too cluttered and confusing. Also, add space for signature approval by Community Development with date and title.

DRAWING STANDARDS CHECKLIST

LANDSCAPE PLAN

ITEM		GRAPHIC STANDARDS	OK	NA
SECTION VIII	A	Scale: 1" = 10' or 20'		
	B	Drawing size: 24" x 36"		
	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.

REPORT CHECKLIST AND OUTLINE

PRELIMINARY DRAINAGE REPORT

CHECKLIST	OK	NA
Typed text		
Size: 8½ x 11" format		
Bound: Use bar or spiral binder or staple. Do not use a notebook.		
Title Page: a. Name of report and preparer, date of preparation and revision (if any)		
Exhibits: Maximum 11" high and 32" wide, bound in report and folded as required to 8½"x11" size		
Maps attached to or contained in the report: Vicinity Map and Preliminary Major Basin Drainage Map		

OUTLINE

I. GENERAL LOCATION AND DESCRIPTION
   A. Site and Major Basin Location
      1. Streets in the vicinity
      2. Development in the vicinity
   B. Site and Major Basin Description
      1. Acreage
      2. Ground cover types
      3. Hydrologic soil types

II. EXISTING DRAINAGE CONDITIONS
   A. Major Basin
      1. General topography, drainage patterns and features, canals, ditches, wetlands
      2. Previously determined 100-year floodplains
   B. Site
      1. Historic drainage patterns
      2. Inflow characteristics from upstream
      3. Discharge characteristics to downstream sub-basins

III. PROPOSED DRAINAGE CONDITIONS
   A. Changes in Drainage Patterns
      1. Major basin
      2. Site
   B. Maintenance Issues
      1. Access
      2. Ownership and responsibility

IV. DESIGN CRITERIA & APPROACH
   A. General Considerations
      1. Previous drainage studies performed for the area
      2. Master planning issues (large scale considerations)
      3. Constraints imposed by site and other proposed development
   B. Hydrology
      1. Design storms and precipitation
      2. Runoff calculation method
      3. Detention/retention basin design method
      4. Parameter selection procedures
      5. Analysis and design procedures
      6. Justification of proposed methods not presented or referenced in SWMM
   C. Hydraulics
      1. Hydraulic calculation methods
      2. Parameter selection procedures
      3. Analysis and design procedures
      4. Justification of proposed methods not presented or referenced in SWMM

COMMENTS

1. No calculations are required for the Preliminary Drainage Report.
2. It may not be necessary to cover all of the above topics, but the report should address all concerns applicable to the proposed project, even issues not identified above.

REPORT CHECKLIST AND OUTLINE

FINAL DRAINAGE REPORT

CHECKLIST	OK	NA
Typed Text (appendices may be handwritten)		
Bound with staple, bar binder, spiral binder or other method (not a notebook)		
Title Page: a. Name of report and preparer, date of preparation and revision (if any) b. Professional's seal and signature		
Table of Contents: For text and appendices, if any (appendices shall be paged)		
Exhibits: Folded to 8½"x11" size		
Maps attached to or contained in the report: Preliminary Major Basin Drainage Map — Pre-development Drainage Map Final Major Basin Drainage Map — Post-development Drainage Map		

OUTLINE

I to IV. Same as for the Preliminary Drainage Report (see X-12)

V RESULTS AND CONCLUSIONS
- A. Runoff Rates for 2 and 100 Year Storm (use tabular format)
  1. Existing total site runoff rates
  2. Existing runoff rates to individual private properties
  3. Proposed total site runoff rates (after detention/retention)
  4. Proposed runoff rates to individual private properties (after detention/retention)
- B. Overall Compliance
  1. Policy
  2. Criteria
  3. Constraints

VI REFERENCES

VII APPENDICES
- A. Existing Runoff (2 and 100 year)
  1. Precipitation (if different than shown in SWMM)
  2. Runoff coefficients
  3. Times of concentration or lag times
  4. Intensities or other parameters
  5. Runoff calculations (individual sub-basins and combined at all design points)
  6. Tabular summary of runoff rates
- B. Proposed Runoff (2 and 100 year)
  1. Precipitation (if different than shown in SWMM)
  2. Runoff coefficients
  3. Times of concentration or lag times
  4. Intensities or other parameters
  5. Runoff calculations (individual sub-basins and combined at all design points)
  6. Tabular summary of runoff rates
- C. Detention Basin Calculations (2 and 100 year)
  1. If Rational & Modified Rational methods are used
     a. Average release rate
     b. Critical durations and intensities
     c. Volume required
     d. Volume available
     e. Storage - depth - discharge
     f. Lower stage outlet
     g. Upper stage outlet
     h. Erosion protection
  2. If Computer or other method of analysis is used
     a. Provide discharge parameters
     b. Provide basin parameters
     c. Provide inflow/outflow information
     d. Erosion protection

REPORT CHECKLIST AND OUTLINE

FINAL DRAINAGE REPORT (continued)

OUTLINE

D. Retention Basin Calculations (100 year)
   1. Basin Feasibility
      a. Groundwater depths
      b. Soil percolation results
      c. Letter from geotechnical Engr.
   2. If Rational Method is used
      a. Volume to be retained
      b. Volume available
   3. If computer or other analysis is used
      a. Provide basin parameters
      Provide inflow information
E. Street Flow
   1. Rate
   2. Depth and velocity
F. Inlets
   1. Rate
   2. Interception
   3. Bypass and to where
G. Storm Drains
   1. Rate
   2. Size and "n" value
   3. Capacity
   4. Hydraulic gradient (if pipe is surcharged or if frictional slope is greater than the pipe slope)
H. Open Channel Flow
   1. Channel geometrics
   2. "n" values and velocities
   3. Erosion protection
   4. Freeboard
I. Culverts
   1. Completed HDS-5 nomographs
J. Miscellaneous Hydraulic calculations

COMMENTS

1. It may not be necessary to cover all of the above topics, but the report should address all concerns applicable to the proposed project, even issues not identified above.

Mesa County Planning Division
Project Narrative

PROJECT NAME: LOUIS BRACH MINI STORAGE UNITS
OWNER: LOUIS BRACH
DATE: FEBRUARY 17,1995

1. The buildings will house mini storage space.

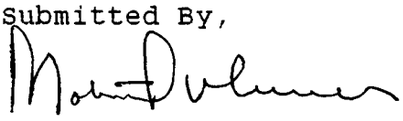
2. The new structure will be 19,400 total square feet. There will be seven separate buildings containing different square footages as shown on plan.There will be one employee on site as storage manager.

3. The construction will be a slab on grade with pre-engineered steel structures. Parking and landscaping as required will be completed as shown on plan.

4. The area that would be impacted by the stuctures would be the corner of Monument Road and Brach Drive.The lot is now vacant.The new structure will have little impact on other buildings in the immediate area.

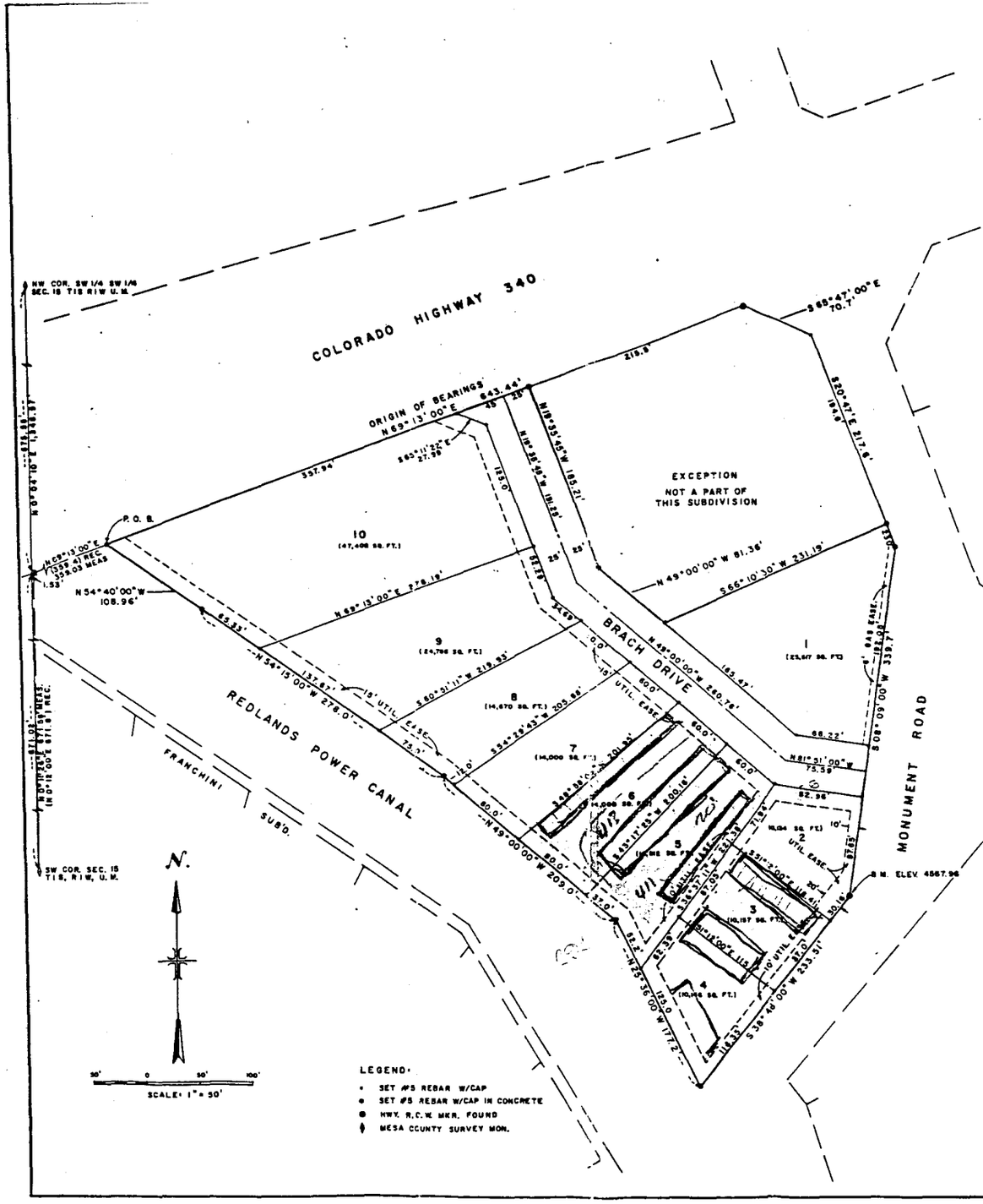
5. There are no special conditions to be considered.

Submitted By,



Robert V. Turner
Alco Building Company Inc.

PIONEER VILLAGE SOUTH



DEDICATION

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned Brach,Inc., a Colorado Corporation is the owner of that real property situated in the County of Mesa, State of Colorado and being a part of the SW¼ SW ¼, section 15 T.1 S., R.1 W., Ute Meridian as shown on the accompanying plat, said real property being more particularly described as follows:

Beginning NO°11'26"E 671.56 feet and N69°13'00"E 359.03 feet from the Southwest Corner of Section 15, Township 1 South, Range 1 West of the Ute Meridian, thence N69°13'00"E 643.44 feet, thence S65°47' 00"E 70.7 feet, thence S20°47'00"E 217.6 feet, thence S8°09'00"W 339.7 feet, thence S38°48'00"W 233.51 feet, thence N25°36'00"W 177.2 feet, thence N49°00'00"W 209.0', thence N54°15'00"W 278.0 feet, thence N54°40'00"W 108.96 feet to the point of beginning. EXCEPT: Beginning NO°11'26"E 671.56 feet and N69°13'00"E 786.97 feet from the Southwest corner of Section 15, Township 1 South, Range 1 West of the Ute Meridian, thence N69°13'00"E 215.5 feet, thence S65°47'00"E 70.7 feet, thence S20°47' 00"E 194.6 feet, thence S66°10'30"W 231.19 feet, thence N49°00'00"W 81.36 feet, thence N19°35'45"W 185.21 feet to the point of beginning.
Containing 4.872 acres more or less.

That said owners have caused the said real property to be laid out and surveyed as Pioneer Village South,a subdivision of a part of Mesa County, Colorado.

That said owners do hereby dedicate and set apart all of the streets and roads as shown on the accompanying plat to the use of the public forever, and hereby dedicate to the UTILITIES those portions of real property which are labeled as utility easements on the accompanying plat, as easements for the installation and maintenance of utilities and drainage facilities, including but not limited to electric lines, gas lines and telephone lines; together with the right to trim interfering trees and brush; together with the perpetual right of ingress and egress for installation, maintenance and replacement of such lines. Said easements and rights shall be utilized in a reasonable and prudent manner.

That all expense for street paving or improvements shall be furnished by the seller or purchaser, not by the County of Mesa.

IN WITNESS WHEREOF said owners have caused their names to be hereunto subscribed this_____day of _____ A.D., 19___.

Brach, Inc.
a Corporation

Attest:
Betty M. Brach, Secretary

_____
Louis R. Brach, President

STATE OF COLORADO)
) ss
COUNTY OF MESA)

The foregoing instrument was acknowledged before me this____day of _____,A.D.,19___ by Louis R. Brach as president, and Betty M. Brach as Secretary of Brach, Inc. a Corporation.

My Commission Expires:_____.
Witness My Hand and Official Seal

_____
Notary Public

CLERK AND RECORDERS CERTIFICATE

STATE OF COLORADO)
) ss
COUNTY OF MESA)

I hereby certify that this instrument was filed in my office at____o'clock____.M.,this____day of _____A.D.,19___,and is duly recorded in Plat Book NO.____,Page_____.

Fees $_____

_____ _____
Clerk and Recorder Deputy

COUNTY PLANNING COMMISSION CERTIFICATE

Approved this____day of_____A.D.,19___. County Planning Commission of the County of Mesa, Colorado.

_____
Chairman

BOARD OF COUNTY COMMISIONERS CERTIFICATE

Approved this____day of_____A.D.,19___. Board of County Commissioners of the County of Mesa, Colorado.

_____
Chairman

SURVEYOR'S CERTIFICATE

I, J. Boyd Peterson, do hereby certify that the accompanying plat of Pioneer Village South, a subdivision of a part of the County of Mesa, has been prepared under my direction and accurately represents a field survey of same.

J. Boyd Peterson
Registered Land Surveyor
Colorado Registration No. 5837

5837

By:_____ Date:_____
Mesa County Road Department

WESTERN ENGINEERS, INC
PLAT OF
PIONEER VILLAGE SO
MESA COUNTY, COLORADO
SURVEYED ___ DRAWN ___ CHECK
GRAND JUNCTION, COLO. DWG. FND-726-6

KRABACHER ASSOCIATES
ARCHITECT & ENGINEER
2224 North First Street
Grand Junction, CO 81501
(303) 243-9248

MARCH 24, 1995

LOUIS BRACH STORAGE UNITS, LOTS 3, 4, 5 & 6, PIONEER VILLAGE SOUTH, GRAND JUNCTION, COLORADO

ALCO BUILDING COMPANY, INC., 599 25 ROAD, GRAND JUNCTION, CO 81501 242-1423. CONTRACTOR

HYDROLOGY CALCULATIONS:

1. SITE AREA: 52,772 SF (1.21 ACRES)

2. BUILDING AREA: 19,400 SF (0.44 ACRES)

3. PAVED AREA: (33372-3294 LS) 30,078 SF (0.69 ACRES)

4. PAVED AREA + BUILDING AREA 49,748 SF (1.14 ACRES)

5. C:

	2 YEAR	100 YEAR	(ACRES)
BUILDING + PAVED AREA	~~0.90~~	~~0.95~~	1.14
LANDSCAPED	0.20	0.50	0.075

ASSUMES LANDSCAPI WILL BE GREEN THAN PROPOSED PLAN INDICAT

6. COMP. C:

$$\frac{(0.075 \times 0.20) + (1.14 \times 0.90)}{1.21} = 0.86 \text{ (2 YR)}$$

$$\frac{(0.075 \times 0.50) + (1.14 \times 0.95)}{1.21} = 0.93 \text{ (100 YR)}$$

7. Tc: (DRCOG) D = 365'; S = 1%

$$\frac{1.8\,(1.1 - 0.86)\,\sqrt{\text{~~365~~ 300 (MAX. ALLOWED)}}}{1.0^{.333}} = \text{~~8.2~~ 7.5 MIN} \quad 2 \text{ YR} \quad (i = \text{~~1.64~~ 1.7})$$

$$\frac{1.8\,(1.1 - 0.93)\,\sqrt{\text{~~365~~ 300}}}{1.0^{.333}} = \text{5.8 3 MIN} \quad 100 \text{ YR} \quad (i = \text{~~1.85~~ 4.86})$$

8. Q: Cf (ANTECEDENT FACTOR) 2 YR = 1.02; 100 YR = 1.25

~~1.02~~ x 0.86 x ~~1.64~~ 1.70 x 1.21 = ~~1.74~~ 1.7 CFS 2 YR

~~1.02~~ x 0.93 x ~~1.85~~ 4.86 x 1.21 = ~~2.60~~ 5.47 CFS 100 YR

9. RO:

~~8.2~~ 7.5 x 60 x ~~1.64~~ 1.70 x 0.86 x 1.21 = ~~850~~ 878 CF 2 YR

~~5.8~~ 5.3 x 60 x ~~1.85~~ 4.86 x 0.93 x 1.21 = ~~724~~ 1739 CF 100 YR

JOSEPH E. KRABACHER REGISTERED PROFESSIONAL ENGINEER STATE OF COLORADO

10. HISTORICAL SITE:

C: 0.20 2 YR; 0.50 100 YR.

11. Tc:

$$\frac{1.8\,(1.1 - 0.20)\,\sqrt{365}}{1.0^{.333}} = 31 \text{ MIN} \quad (i = 0.86)$$

(300 MAX ALLOWED) → 29 MIN; .92

$$\frac{1.8\,(1.1 - 0.50)\,\sqrt{365}}{1.0^{.333}} = 21 \text{ MIN} \quad (i = 1.08)$$

(300 MAX ALLOWED) → 18.7; 2.93

12. Cf: 1.02 2 YR; 1.25 100 YR.

Q: 1.02 x 0.20 x 0.86 x 1.21 = 0.24 CFS 2 YR
1.25 x 0.50 x 1.08 x 1.21 = 0.82 CFS 100 YR

→ .92; 2; 2.93; 1.77

13. RO: 31 x 60 x 0.86 x 0.20 x 1.21 = 387 CF 2 YR
21 x 60 x 1.08 x 0.50 x 1.21 = 823 CF 100 YR

→ 29; .92; 374; 18.7; 878; 2.93; 1998

14. RO_{D2} = 850 CF
RO_{S2} = 387 CF
374 463 CF → 504

15. RELEASE RATE: 0.82 CFS

(FRANCIS): $3.33 \times 0.125 \times 1.0^{1.5} = 0.417$ CFS

RELEASE SLOT: 1 1/2" x 12".

RETAINING AREA: FOR 463 CF (1' DEEP x 10' WIDE x 47' LONG)

CITY REQUIRES DETENTION OF BOTH 2YR. AND 100 YR. EVENTS — PLEASE USE THE PROCEDURE IN APPENDIX N OF SWMM MANUAL

JOSEPH E. KRABACHER — REGISTERED PROFESSIONAL ENGINEER — STATE OF COLORADO — 9583

L = Length of the flow plane in feet (300 feet maximum);
N = Overland flow resistance factor (See Table "E-1" on page E-5 for values);
I = Rainfall intensity in inches/hour (See Table "A-1" in Appendix "A"); and
S = Average slope of the overland plane in feet/feet.

Two procedures are provided herein for the direct solution of To. The first and easier method is a tabular procedure shown in Table "E-2" on page E-6.

The second procedure involves use of a nomograph taken from HEC-12 reproduced herein as Figure "E-1" which is shown on page E-7. The slope, overland flow resistance factor, and length must be known. At that point, a single line must be drawn from the turning point through a Tc and I value that correspond to each other per Table "A-1" in Appendix "A".

The HEC-12 equation is very similar to the Bureau of Public Roads method developed by Izzard in 1946. Recommendations for the Izzard equation are that the product of "I" and "L" should not exceed 500, which recommendation has been found in two sources: "Applied Hydrology" and "Water Supply and Sewerage". However, in HEC-12, the text is not the most clear, but application of the equation is recommended for where I x L $\geq$ 500, which is just the opposite of the above recommendations. Reasons behind the "500" limit are not provided for either equation, nor is it certain whether or not a typographical error is involved. It would seem likely, however that, if the product I x L was not excessively far from 500 one way or another, that the results may be acceptable.

3. **Federal Aviation Administration 1970 Method** The method prescribed by the FAA is based upon data assembled by the Army Corps of Engineers, and was intended for use on airfield drainage problems. However, it has frequently been used for overland flow in highly developed urbanized areas. In Colorado, where the method has been adopted by CDOT and UD&FCD, its use is widespread. The equation is

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

Where:

To = Overland flow travel time in minutes (5 minutes minimum);
C = Rational method runoff coefficient (see Table "B-1" in Appendix "B");
L = Length of the flow plane in feet (300 feet maximum);
S = Average percent slope of the overland plane.

Figure "E-2" on page E-8 provides a graphical solution to the above equation.

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

APPENDIX "N"
DETENTION VOLUME & THE MODIFIED RATIONAL METHOD

TABLE OF CONTENTS

List of Figures

APPENDIX "N"
DETENTION VOLUME & THE MODIFIED RATIONAL METHOD

1. **General Discussion** Criteria and design requirements for detention basins are covered in Section VIII, and are not treated further here. However, one aspect of detention basin design is determining the volume required, which is integrated with outlet work design. If non-computer methods are used, procedures are usually iterative and tedious. They also are typically based upon the Modified Rational Method (MRM). In this appendix, procedures are provided which not only simplify the manual calculation process, but which reduce the likelihood of misuse of the MRM.

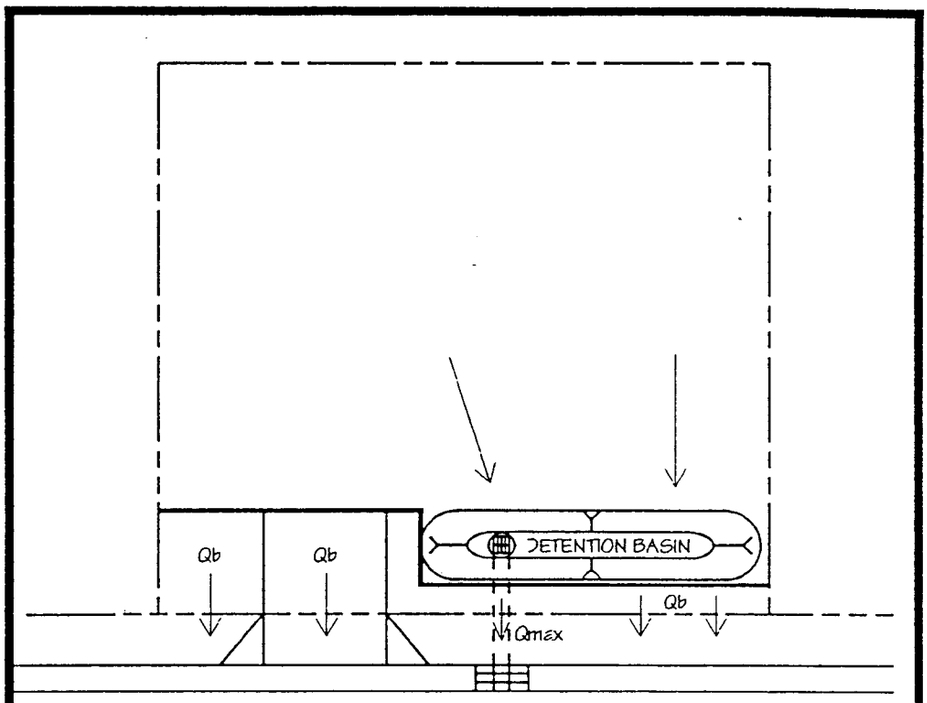
2. **Manual Calculation Procedures** Without simplification or restriction to specific types of outlet facilities, hand calculations are generally iterative. While this would not pose a serious problem, it is realized that a few simplifying assumptions and/or relationships could significantly reduce design effort, and still allow for detention/outlet facility designs that probably have less inaccuracy associated with them than there is with the base hydrologic data upon which they are based.

   Use of the simplified manual calculation procedures presented herein are not required. One may, if desired, pursue a more detailed design. Sophisticated procedures for certain types of outlets are provided in an SCS publication entitled Hydraulics of Two-Stage Risers. However, it is assumed that most will be interested in an allowed simplified procedure, which the balance of this appendix addresses.

   The simplified manual calculation procedures involve the following concepts or steps, which are subsequently discussed in more detail:

   (i) Rational Method Hydrology;
   (ii) Basic Hydraulic Relationships;
   (iii) Modified Rational Method Runoff Volume;
   (iv) Calculating Available Storage Volume by the Conic Equation;
   (v) Establishing a Volume-Depth-Discharge (V-D-Q) Graph;
   (vi) Sizing the Lower Stage Outlet; and
   (vii) Designing the Upper Stage Outlet.

   a. **Rational Method Hydrology** The manual procedures presented herein are based upon use of the Rational Method for hydrological calculations. This is partly due to the frequent use of the Rational Method, and partly due to the fact that most computer programs which estimate storm runoff also contain routines for reservoir or pond routing of runoff, and therefore manual calculations are not necessary.



Maximum release from detention pond Qmax ≤ Historic peak Q_h minus direct bypass runoff Qb

$Qmax \leq Q_h - Qb$

DETERMINATION OF Qmax	FIGURE "N-1"

The first error is difficult to deal with quantitatively. We have chosen to account for the truncation simply by a multiplication factor, which is explained later.

The second error is caused by the user of the method. Pond release rates may be governed by pipe flow, or orifice or weir flow into an inlet. Outflow will begin at zero cfs, and is allowed to peak at Qmax which may equal the historic rate Q_h minus Qb, if any, and recedes back to zero. Acceptable approximations of the average release Qr during the time of interest are provided in subsection "b" above.

The third and fourth errors are due to the selected equation and user application. Both may be avoided by use of equations presented in "Applied Hydrology". Use of these equations for determining the critical duration is mandatory if the Modified Rational Method is used.

A factor of 60 in the volume equation converts time from minutes to seconds, yielding cubic feet volume.

d. **Geometrically Designing the Detention Basin** With known required storage volumes required per subsection "c" above, Figure "N-3" on page N-10 may be used along with known site and desired finish conditions to size and geometrically design the detention basin.

e. **Calculating the Volume-Depth Relationship** Available incremental and total volumes of the detention basin may be calculated per criteria presented in Figure "N-4" on page N-11. By calculating available volume at incremental heights, a volume-depth (V-D) relationship may be determined and graphed. Usually only 2 or 3 calculations are adequate if taken at key points, such as at the toe and top of embankment slopes.

f. **Lower Stage Outlet** Entering the V-D graph with the V_2 calculated per "c" above, one may directly read the ponded two year water depth, or d_2. Knowing d_2 and $Qmax_2$, the lower stage outlet may be sized. The capacity of the lower stage outlet could also be determined for greater depths, providing adequate information to allow plotting the lower outlet depth-discharge (D-Q) curve. If plotted on the V-D curve, with storage volume on the left ordinate, depth on the bottom abscissa, and discharge on the right ordinate, a handy V-D-Q graph is formed.

g. **Upper Stage Outlet** Although it would not minimize detention volume, one could provide a single stage outlet that would just meet the criteria for one design storm, and be an overdesign for the other; that is, the release rate may be below the historic rate for one of the design storms. If this approach is taken, the capacity of the selected outlet must be checked under both storm conditions.

The more probable design approach, particularly for larger watersheds, is to provide a two-stage outlet, with the upper stage outlet invert beginning at d_2. By entering V_{100} onto the V-D (or V-D-Q) graph, one may directly read the maximum water depth ponded in the 100 year storm event, or d_{100}. Using d_{100}, one may calculate the capacity of the lower stage outlet, or read it directly from the graph if it was plotted. The allowed capacity of the upper stage outlet is $Qmax_{100}$ minus the lower outlet capacity at d_{100}. Note that d_{100} is the total water depth in the pond, which is usually not the depth or height used in upper outlet weir or orifice calculations. Knowing the allowable capacity and available water depth, the upper stage outlet may be sized. (At this point, a few calculations at different depths would allow plotting the depth-discharge curve for the upper outlet, and also the plotting of the composite or total depth discharge curve. Observation of the graph could provide a double check on the analysis.)

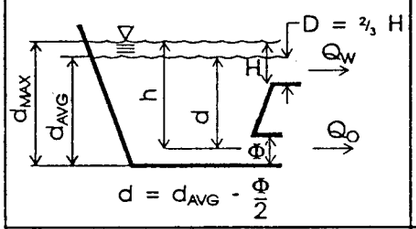
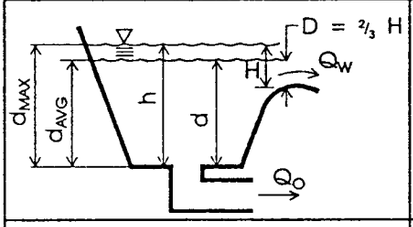
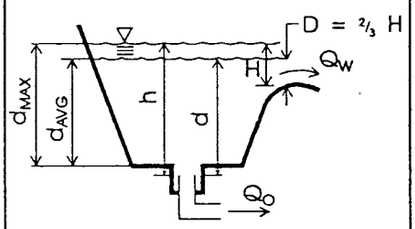
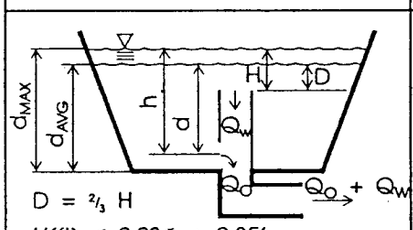
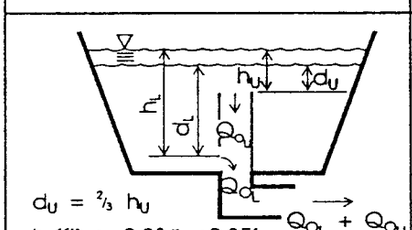
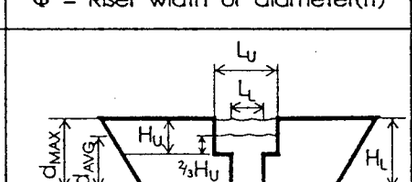
steps (3) and (8), the lower stage outlet depth-discharge (D-Q) relationship may be plotted separately or combined with the V-D graph, forming a V-D-Q graph.)

9) The upper stage outlet may be sized to have a maximum capacity equal to $Qmax_{100}$ minus the outlet capacity of the lower stage outlet at d_{100}. The head on the upper stage outlet is usually $d_{100} - d_2$. Knowing the available head and allowable outflow, the upper stage outlet may be readily sized.

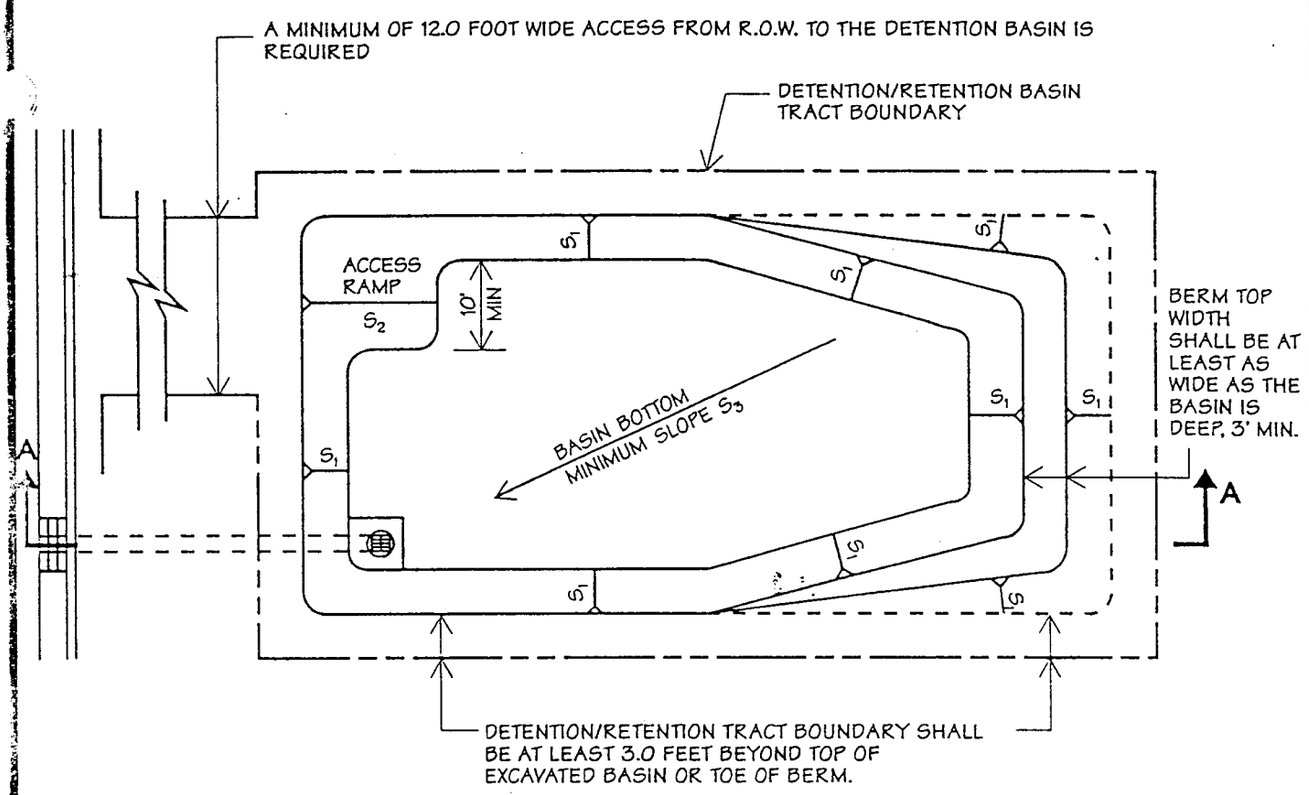
10) Provide for an overflow or spillway facility, and also an adequate downstream conveyance facility for the outlets.

Qr = Average release rate during a given storm = $(\Sigma Q_{ORIFICE} + \Sigma Q_{WEIR}) \leq (Q_{historic} - Q_{bypass})$
NOTE: Equations assume that downstream pipes or channels do not impede orifice or weir flow.

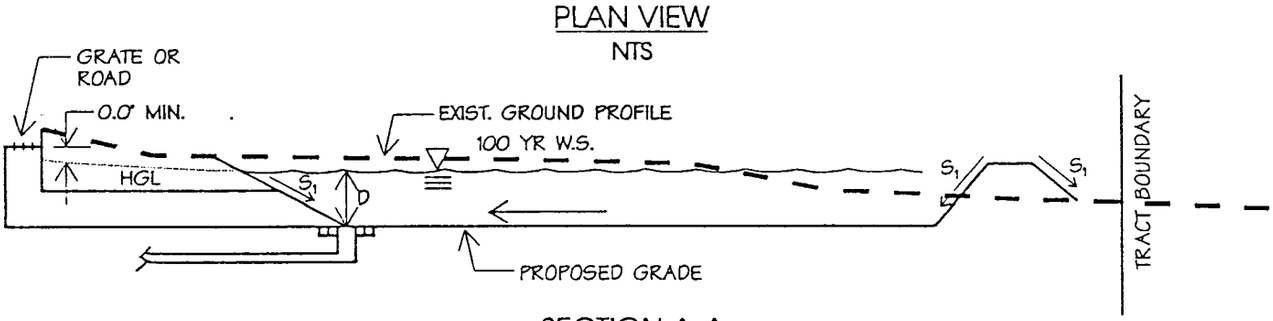
ORIFICE AND WEIR COMBINATIONS

DIAGRAM	Q_{MAX}	Qr based on d	Qr (rough) based on Q_{MAX}
	$Q_{MAX} = Q_O + Q_W$ $= CA(2gh)^{0.5} + CLH^{1.5}$	$Qr = Q_O + Q_W$ $= CA(2gd)^{0.5} + CLD^{1.5}$	$Qr = 0.65\ Q_{MAX}$
	$Q_{MAX} = Q_O + Q_W$ $= CA(2gh)^{0.5} + CLH^{1.5}$	$Qr = Q_O + Q_W$ $= CA(2gd)^{0.5} + CLD^{1.5}$	$Qr = 0.65\ Q_{MAX}$
	$Q_{MAX} = Q_O + Q_W$ $= CA(2gh)^{0.5} + CLH^{1.5}$	$Qr = Q_O + Q_W$ $= CA(2gd)^{0.5} + CLD^{1.5}$	$Qr = 0.65\ Q_{MAX}$
	$Q_{MAX} = Q_O + Q_W$ $= CA(2gh)^{0.5} + CLH^{1.5}$	$Qr = Q_O + Q_W$ $= CA(2gd)^{0.5} + CLD^{1.5}$	$Qr = 0.65\ Q_{MAX}$
	$Q_{MAX} = Q_{O_L} + Q_{O_U}$ $= CA(2gh_L)^{0.5} + CA(2gh_U)^{0.5}$	$Qr = Q_{O_L} + Q_{O_U}$ $= CA(2gd_L)^{0.5} + CA(2gd_U)^{0.5}$	$Qr = 0.70\ Q_{MAX}$
DBL WEIR 	$Q_{MAX} = Q_{W_L} + Q_{W_U}$ $= CL_L H_L^{1.5} + C(L_U - L_L)H_U^{1.5}$	$Qr = Q_{W_L} + Q_{W_U}$ $= CL_L(H_L - \frac{H_U}{3})^{1.5} +$ $C(L_U - L_L)(.67H_U)^{1.5}$	$Qr = 0.50\ Q_{MAX}$

CALCULATING APPROXIMATE STORAGE RELEASE RATES | **FIGURE N-2b**



PLAN VIEW
NTS



SECTION A-A
NTS

STEEPEST S_1: 4H:1V FOR BASINS ON PUBLIC LANDS AND PARKS
3H:1V FOR SEEDED OR SODDED SLOPES
2H:1V FOR RIPRAP OR OTHER APPROVED SLOPE PROTECTION
VERTICAL WALLS WITH SAFETY RAILING LIMITED TO ONE SIDE ONLY WHERE APPROVED BY THE CITY ENGINEER.

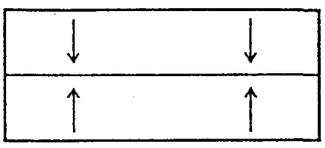
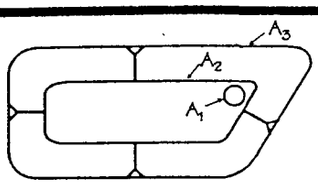
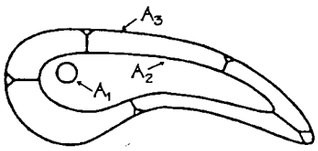
STEEPEST S_2: 6H:1V FOR ACCESS RAMP, ALL SURFACES

MINIMUM S_3: 0.5% FOR CONCRETE CHANNEL
1.0% FOR ASPHALT (PARKING LOT)
2.0% FOR ALL OTHER SURFACES

MAXIMUM D: 4' RETENTION BASIN
8' WET OR DRY DETENTION FACILITY
>8' SPECIAL APPROVAL REQUIRED, BUT MAY BE ALLOWED FOR MULTIPLE USE PONDS OR FOR STEEP TERRAINS

MINIMUM D: 4' WET PONDS (SEE PAGE VIII-1)

DETENTION BASIN GEOMETRIC REQUIREMENTS	FIGURE N-3

BASIN SHAPE		 
BASIN TYPE	VERTICAL WALLS AND/OR PRISMATIC BASINS	FAIRLY UNIFORM SHAPE AND SIDE SLOPES OR HIGHLY IRREGULAR SHAPE AND SIDE SLOPES
VOLUME CALCULATION METHOD	AVERAGE END AREA METHOD	CONIC METHOD
EQUATION	$V = \left(\frac{A_n + A_{n+1}}{2}\right) L$	$V = \Sigma V_{n \text{ to } n+1}$ $V_{n \text{ to } n+1} = [A_n + A_{n+1} + (A_n A_{n+1})^{.5}]\frac{h}{3}$

WHERE:
- V = Volume (ft)
- A_n = Horizontal area (ft^2) at elevation "n"
- A_{n+1} = Horizontal area (ft^2) at elevation "n+1"
- h = Vertical height (ft) between elevation "n" and "n+1"
- $V_{n \text{ to } n+1}$ = Volume between elevation "n" and "n+1"
- L = Length (ft) between two ends

NOTE: The above equations may be used in succession for incremental heights within a basin. An area should be selected at all significant changes in shape or side slope.

CALCULATING STORAGE VOLUME | **FIGURE N-4**

B. **CRITERIA** Criteria are more thoroughly presented in Sections VI through X, with additional information and guidelines for use presented in Appendices. Only a brief outline summary is provided here.

1. **Design Storms** Drainage facilities shall, as a minimum, be designed for storm conditions as prescribed in Tables "I-1" and "I-2". The governmental entity having jurisdiction shall have authority to determine the classification of proposed features on a case by case basis.

TABLE "I-1"
DESIGN STORM FREQUENCY

Drainage Feature	2-Yr Storm	100-Yr Storm
Water quality control	X	
On-site runoff collection and conveyance facilities [street flow below inundation limits (see Appendix "G"), inlets, most local storm sewers, and smaller channels].	X	
Detention/retention to prevent an increase in total watershed runoff and also sub-watershed runoff to any downstream property or drainage facility.	X*	X*
Drainage Fee		X**
Major channels and outfall facilities [usually culverts, open channels, and streets above inundation limits, but may include inlets and storm sewers].		X
Concentrated flows must be at least 1.0 foot below adjacent finished floors of habitable dwellings and within drainage tracts or easements.		X

* Detention/retention is required unless the Drainage Fee option is allowed and exercised.
** See Section VIII B for requirements and condition.

KRABACHER ASSOCIATES
ARCHITECT & ENGINEER
2224 North First street
Grand Junction, CO 81501
(970) 243-9248

APRIL 11, 1995

LOUIS BRACH STORAGE UNITS, LOTS 3, 4, 5 & 6, PIONEER VILLAGE SOUTH, GRAND JUNCTION, COLORADO

ALCO BUILDING COMPANY, INC., 599 25 ROAD, GRAND JUNCTION, CO 81501 242-1423. CONTRACTOR

GRADING AND DRAINAGE CALCULATIONS REQUIRED BY THE CITY OF GRAND JUNCTION FOR/AND PRIOR TO OBTAINING A BUILDING PERMIT

1. SITE AREA: 52,772 SF (1.21 ACRES)

2. BUILDING AREA: 19,400 SF (0.44 ACRES)

3. PAVED AREA: (33372-3294 LS) 30,078 SF (0.69 ACRES)

4. PAVED AREA + BUILDING AREA 49,748 SF (1.14 ACRES)

5. C:

	2 YEAR	100 YEAR	(ACRES)
BUILDING + PAVED AREA	0.90	0.95	1.14
LANDSCAPED	0.45	0.60	0.075

6. COMP. C:

$$\frac{(0.075 \times 0.45) + (1.14 \times 0.90)}{1.21} = 0.87 \quad (2\ YR)$$

$$\frac{(0.075 \times 0.60) + (1.14 \times 0.95)}{1.21} = 0.93 \quad (100\ YR)$$

7. Tc: (DRCOG) D = 300'; S = 1%

$$\frac{1.8\ (1.1 - 0.87)\ 300^{0.5}}{1.0^{0.333}} = 7.5\ MIN \quad 2\ YR \quad (i = 1.70)$$

$$\frac{1.8\ (1.1 - 0.93)\ 300^{0.5}}{1.0^{0.333}} = 5.3\ MIN \quad 100\ YR \quad (i = 4.86)$$

8. Q: Cf (ANTECEDENT FACTOR) 2 YR = 1.02; 100 YR = 1.25
(Common factor used for years to adjust rational method, but not accepted by the City) {delete below}

{1.02} x 0.87 x 1.70 x 1.21 = 1.80 CFS 2 YR
{1.25} x 0.93 x 4.86 x 1.21 = 5.50 CFS 100 YR

9. RO:

7.5 x 60 x 1.70 x 0.87 x 1.21 = 805 CF 2 YR
5.3 x 60 x 4.86 x 0.93 x 1.21 = 1739 CF 100 YR

10. HISTORICAL SITE:

C: 0.25 2 YR; 0.40 100 YR.

11. Tc:

$$\frac{1.8\ (1.1 - 0.25)\ 300^{0.5}}{1.0^{.333}} = 26.5 \text{ MIN} \quad (i = 0.95)$$

$$\frac{1.8\ (1.1 - 0.40)\ 300^{0.5}}{1.0^{.333}} = 22.0 \text{ MIN} \quad (i = 2.70)$$

12. Cf: 1.02 2 YR; 1.25 100 YR. {NOT USED/#8 ABOVE}

Q: {1.02} x 0.25 x 0.95 x 1.21 = 0.28 CFS 2 YR
{1.25} x 0.40 x 2.70 x 1.21 = 1.31 CFS 100 YR

13. RO:

26.5 x 60 x 0.95 x 0.25 x 1.21 = 457 CF 2 YR
22.0 x 60 x 2.70 x 0.40 x 1.21 = 1725 CF 100 YR

14. RO_{D2} = 805 CF RO_{D100} = 1739 CF
RO_{H2} = 457 CF RO_{H100} = 1725 CF
348 CF 14 CF

Simplified modified Rational Method calculations as required by the City of Grand Junction in lieu of using antecendent factors in calculations.

	Developed		Hysterical	
	2 yr	100 yr	2 yr	100 yr
Tc	7.5	5.3	26.5	22.0
C	0.87	0.93	0.25	0.40
Q_p	1.8	5.5	0.28	1.31
Q_R	0.99	3.0	0.154	0.72

15. $T_{d2} = \left[\frac{6.33.4 \times 0.87 \times 1.21}{0.99 - \frac{0.99^2 \times 7.5}{81.2 \times 0.87 \times 1.21}} \right]^{0.5} - 15.6 = 11.6 \text{ MIN}$

16. $T_{D100} = \left[\frac{1832 \times .093 \times 1.21}{3.0 - \frac{3.0^2 \times 5.3}{213 \times 0.93 \times 1.21}} \right]^{0.5} - 17.2 = 9.93 \text{ MIN}$

16. $I_{d2} = \frac{40.6 \times 316.7 \times 2}{(11.6 + 15.6)(633.4)} = 1.49$ in/hr

$I_{d100} = \frac{106.5 \times 39.21 \times 2}{(9.93 + 17.2)(78.42)} = 3.92$ in/hr

17. $Q_{d2} = 0.87 \times 0.50 \times 1.49 \times 2.0 = 1.57$ cfs

$Q_{d100} = 0.93 \times 1.21 \times 3.92 = 4.41$ cfs

18. $K_2 = 26.5/7.5 = 3.53$ $K_{100} = 22.0/5.3 = 4.15$

19. $V_2 = \frac{(1.57 \times 11.6) - (0.99 \times 11.6) - (0.99 \times 7.5) + (3.53 \times 0.99 \times 7.5)}{\frac{2 + 0.99^2 \times 7.5}{2 \times 1.57}} \times 60 = 514$ cf

$V_{100} = \frac{4.41 \times 9.93) - (3.0 \times 9.93) - (3.0 \times 5.3) + (4.15 \times 3.0 \times 5.3)}{\frac{2 + 3.0^2 \times 5.3}{2 \times 4.41}} \times 60 = 683$ cf

20. RO (with modified T_d, I_d,)

RO (V_2 = 11.6 x 60 x 1.49 x 0.87 x 1.21 = 1092 cf
RO (V_{100} = 9.93 x 60 x 3.92 x 0.93 x 1.21 = 2628 cf

(End of simplified modified rational method calcs.)

21.

	RATIONAL METHOD		MODIFIED METHOD	
	2 YR	100 YR	2 YR	100 YR
V_D	805 CF	1739 CF	514 CF	683 CF
V_H	457 CF	1725 CF	457 CF	1725 CF
	348 CF	14 CF	57 CF	*

22.

Q_D	1.80 CFS	5.5 CFS
Q_H	0.28 CFS	1.31 CFS
RR	1.52 CFS	4.29 CFS

23. RELEASE. 2 YR: RELEASE SIZE 0.333 x 0.667
3.33 x 0.333 x $0.667^{1.5}$ = 0.303 cfs
1.52 / 0.303 = 5 RELEASES

100 YR: 4" DEPTH WEIR IN ADD'N TO SLOTS
LENGTH = $\frac{4.29 - 1.52}{3.33 \times 0.333^{1.5}} = 4.25'$

24. 'POND': 10.0' WIDE x 1.0' DEPTH. (2YR DEPTH USED 0.667')
348 / 10 x 0.667 = 52.0' LONG
PROVIDED 20 + 40 = 60.0'

REVIEW COMMENTS

FILE #SPR-95-60 **TITLE HEADING:** Site Plan Review - Mini-storage Units

LOCATION: 411 Brach Drive

PETITIONER: Louis & David Brach

PETITIONER'S ADDRESS/TELEPHONE: 444 E Scenic Drive
Grand Junction, CO 81503
243-0201

PETITIONER'S REPRESENTATIVE: Joe Krabacher / Alco Building Company

STAFF REPRESENTATIVE: Michael Drollinger

NOTE: WRITTEN RESPONSE (4 COPIES) BY THE PETITIONER TO THE REVIEW COMMENTS IS REQUIRED. A PLANNING CLEARANCE WILL NOT BE ISSUED UNTIL ALL ISSUES HAVE BEEN RESOLVED.

CITY ATTORNEY **3/30/95**
Dan Wilson / John Shaver **244-1505**

O/C as per Atty mtg

1.- Copy of plat map shows not recorded.
Corporate owner of land doesn't match any of the names on the application.-.

CITY UTILITY ENGINEER **3/31/95**
Bill Cheney **244-1590**

✓ No comment.

MESA COUNTY BUILDING DEPARTMENT **3/31/95**
Bob Lee **244-1656**

✓ No comments. We have reviewed and approved the building plans for this project.

REDLANDS WATER & POWER **04/12/95**
Gregg Strong **243-2173**

✓ The Brachs understand Redlands position in regards to our canals. Therefore, Redlands has no comment.

COMMUNITY DEVELOPMENT DEPT.	03/31/95
Michael Drollinger	244-1439

See attached comments.

CITY DEVELOPMENT ENGINEER	04/06/95
Jody Kliska	244-1591

See attached comments.

April 6, 1995

REVIEW COMMENTS FOR: **SPR-95-60 Mini Storage Units**

TYPE OF REVIEW: **Site Plan**

REVIEWED BY: **Jody Kliska**

Drainage

The drainage report and plan need to be revised to comply with the City Standards. I have attached a copy of the Report Outline Format for use with all future submittals. Also attached are copies of portions of the City's Stormwater Management Manual, including the IDF Table for Mesa County, the maximum flow length for use with the calculation used to compute To, and Appendix N which details the equations to use to compute detention volumes. The City requires detention of both the 2 year and 100 year stormwater events. The submitted report only calculated and designed for the 2 year event and the calculation contained some errors which resulted in the calculated storage volume being about half of what is required for this event. No design was submitted for the 100 year event.

The plan needs to show a detail for the proposed outlet structure consistent with the revised drainage report.

Site Plan

All curb cuts must meet City Construction Standards. A permit from the City Engineering office will be required prior to construction and work must be performed by a licensed city contractor.

The placement of buildings on site look like there will be some difficulty with larger vehicles manuevering on-site. I have included a copy of a turning template for a single unit vehicle for your use.

The limits of the paved area are not indicated on the site plan. If building C does not have doors on the northeast side, then not paving behind it would be preferable.

Based on 125 storage units, the Transportation Capacity Payment is $1166.25.

Received 4-19-95

STAFF REVIEW

FILE: #SPR 95-60
DATE: April 3,1995
STAFF: Michael Drollinger
REQUEST: Site Plan Review
LOCATION: 411 Brach Drive
ZONING: C-1

STAFF COMMENTS:

OK 1. Landscaping Plan incomplete, see attached checklist for missing items.

OK 2. Elm trees proposed do not meet minimum size standards; Section 5-4-15B(1) of the Zoning and Development Code requires a minimum of one and one-half inch (1 1/2") caliper (measured one foot above ground level) for all deciduous trees.

number of plants & location of shrubs on plan unclear 3. Minimum area required for landscaping provided, however, landscaping provided does not meet Code requirements as follows:
- Section 5-4-15A requires forty percent (40%) of the landscaped area shall contain shrubs, and the shrub area(s) shall be covered by a minimum of 75% plant material.

OK 4. Eleven (11) trees are required as per Sections 5-4-15A and 5-4-15H while only ten (10) trees are provided.

OK 5. The paving material to be used shall be indicated on the plans; all vehicular travel areas must be paved with asphalt or concrete, gravel is not permitted.

OK 6. Provision should be made for a trash collection area.

OK see letter 7. Subdivision restrictive convenants which we have on file limit development to "masonry type construction" and require architectural control committee (ACC) approval. While the City does not enforce covenants, we would like documentation to show that ACC has had the opportunity to review the proposal.

PLEASE TAKE NOTE OF THE FOLLOWING:

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

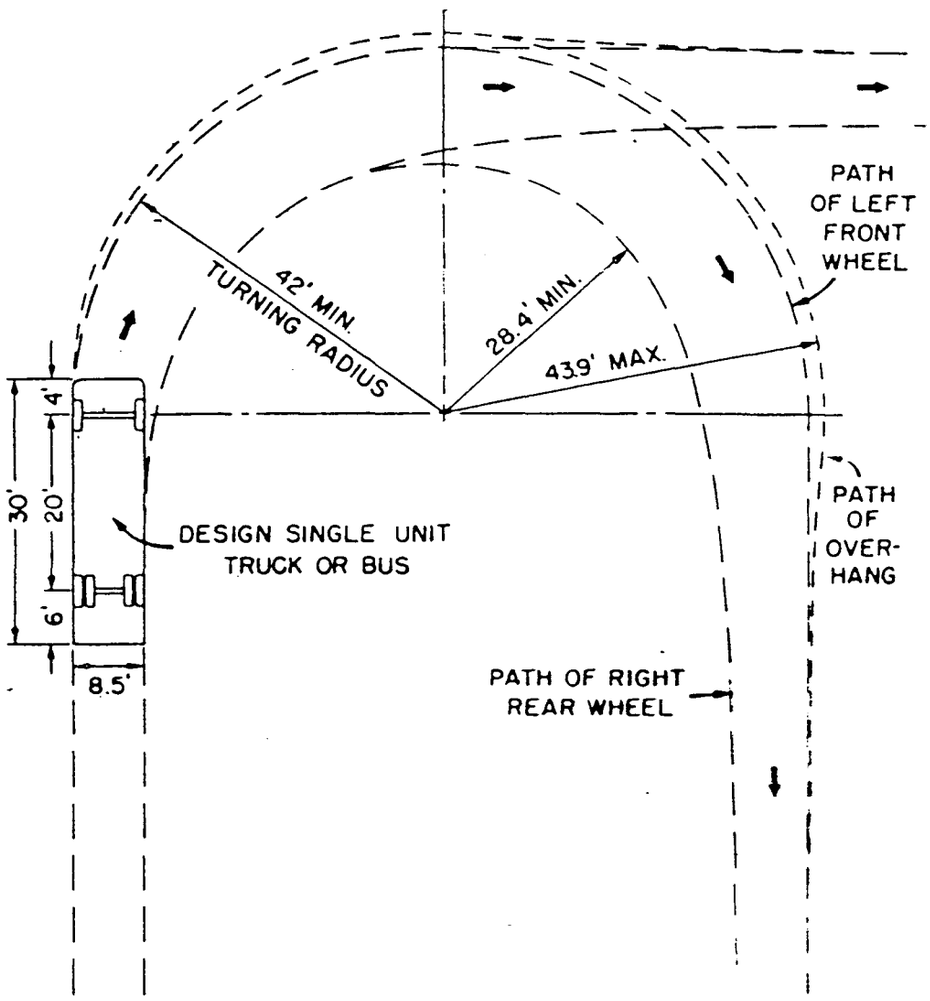
2. SITE IMPROVEMENTS (INCLUDING LANDSCAPING) MUST BE CONSTRUCTED IN

ACCORDANCE WITH THE APPROVED PLANS. ANY MODIFICATIONS MUST BE APPROVED, IN WRITING, BY THE COMMUNITY DEVELOPMENT DEPARTMENT. FAILURE TO INSTALL SITE IMPROVEMENTS AS PER THE APPROVED PLANS MAY DELAY THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

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

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

h:\cityfil\1995\95-603.wpd



SU DESIGN VEHICLE

1" = 20'

Alco Building Company, Inc.

JODY KLISKA: 244-1591 4/17/95

REVIEW COMMENTS FOR: SPR-95-60 MINI STORAGE UNITS.

TYPE OF REVIEW: SITE PLAN.

DRAINAGE: I AM RESPONDING TO COMMENTS DATED 4/04/95.I HAVE RESUBMITTED A PLAN SHOWING PROPER DRAINAGE,RETAINING AND OUTLET SYSTEMS.I HAVE ALSO SUBMITTED A HYDROLOGY REPORT SHOWING 2 AND 100 YEAR STORMWATER EVENTS.

SITE PLAN: TURNING TEMPLATE HAS BEEN DRAWN AND SHOWN ON CURRENT PLAN. CONCRETE PAVING HAS BEEN SHOWN ON CURRENT PLAN.CONCRETE PAVING WILL BE INCLUDED ON EAST SIDE OF BUILDING C.

P. O. Box 996 599 25 Road Grand Junction, Colorado 81502 (303) 242-1423 FAX (303) 242-6918

April 18, 1995

City Attorney
City of Grand Junction
250 North 5th. Street
Grand Junction, CO 81501

Attn: Dan Wilson
244-1505

Subject: Application for Building Permit
Brach's Monument Mini-Storage
411 Brach Drive
Grand Junction, CO 81503

Dear Mr. Wilson,

The purpose of this memo is to clarify certain points in our application for a building permit for a mini-storage project at the above cited address.

The Pioneer Village South Subdivision plat was recorded on July 27, 1979 using Reception Number 1198288, Book 12, Page 188. A copy of this will be obtained and forwarded to you, or the appropriate party.

The project involves 4 lots in the subdivision. Lots 3 and 4 currently are free and clear, the deed is in the names of Dave F. and Ann M. Brach. Lots 5 and 6 are free and clear, the deed is in the name of Brach Inc., Louis R. and Betty M. Brach, corporate officers.

A new partnership has been formed by the above 4 individuals, Brach's Monument Mini-Storage. Partnership papers have been signed. The lots will either be sold or contributed from where they are into the new partnership, and the name on the deeds changed to the new partnership.

Brach Inc., will be dissolved this year, since lots 5 and 6 were the final holdings of this corporation.

If you have questions, or require more information, please don't hesitate to call.

Sincerely,

Dave F. Brach

Dave F. Brach
Partner, Brach's Monument Mini-Storage
244-1249 (Work)
242-0117 (Home)

I SUBMITTED RECORDED PLAT TO DAN WILSON ALONG WITH COPY OF THIS LETTER 4-18-95

JOHN A. KRUGER
242-1423

Grand Junction Community Development Department
Planning • Zoning • Code Enforcement
250 North Fifth Street
Grand Junction, Colorado 81501-2668
(303) 244-1430 FAX (303) 244-1599

April 21, 1995

Attn: Bob Turner
Alco Building Company
599 25 Road
Grand Junction, CO 81505

RE: Brach's Mini-Storage (Our File #SPR95-60)

Dear Mr. Turner,

We have completed the review of your revised plans and have identified the following outstanding issues:

Community Development

1. City Code requires that the area within the City right-of-way (not covered by sidewalk, driveways, etc) be landscaped. This must be clearly indicated on the Landscape Plan.

2. Number & location of shrubs on the plan is unclear; please revise to clarify.

3. Four sets of signed and sealed revised plans must be provided to Community Development which will be stamped and issued with the Planning Clearance.

Development Engineer

1. It is not clear in the report how Qr was selected. Generally, it should be in keeping with Figure N-2 in the City SWMM Manual, consistent with the selected outlet structure design.

2. The calculations for the detention storage volume need to use the developed Qd. When I checked the calculations for the required 100 year storm storage, I came up with a substantially higher required volume. This means the landscaped area proposed as detention is not large enough, and part of the on-site paved area must be used for storage.

3. A volume-depth graphs or table should be developed to determine the maximum depth for the 2-year and 100-year storms and to design the outlet works. A sample drainage study for

a similar-type development is attached.

REVISED PLANS ARE REQUIRED. All issues must be resolved prior to issuance of a Planning Clearance. If you have any questions or require further information please do not hesitate to call.

Sincerely yours,

Michael T. Drollinger
Senior Planner

Encls.

cc: File
Jody Kliska, City Development Engineer

h:\cityfil\1995\95-604.wpd

C.O.'s released
10-12-95
MTD

City of Grand Junction, Colorado
250 North Fifth Street
81501-2668
FAX: (303) 244-1599

August 31, 1995

TO: Louis R. Brach
444 East Scenic Drive
Grand Junction, CO 81503

*see revised drainage plan in file

RE: Final Inspection of 411 Brach Drive by City of Grand Junction
File # SPR-95-60
Staff Planner: Michael T. Drollinger MTD

The Building Department has informed us that a Certificate of Occupancy (C.O.) may soon be issued for your project. Prior to issuance of a C.O. the City is required to inspect the project to determine compliance with the City approvals your project received.

An inspection of your project was performed on August 25 and the following deficiencies noted:

- ☒ Drainage facilities not completed as per approved plans
- ☐ Parking not provided as per approved plans
- ☐ Site circulation not provided as per approved plans
- ☐ Landscaping not provided/installed as per approved plans
- ☐ Other required improvements not provided as detailed below:

_____

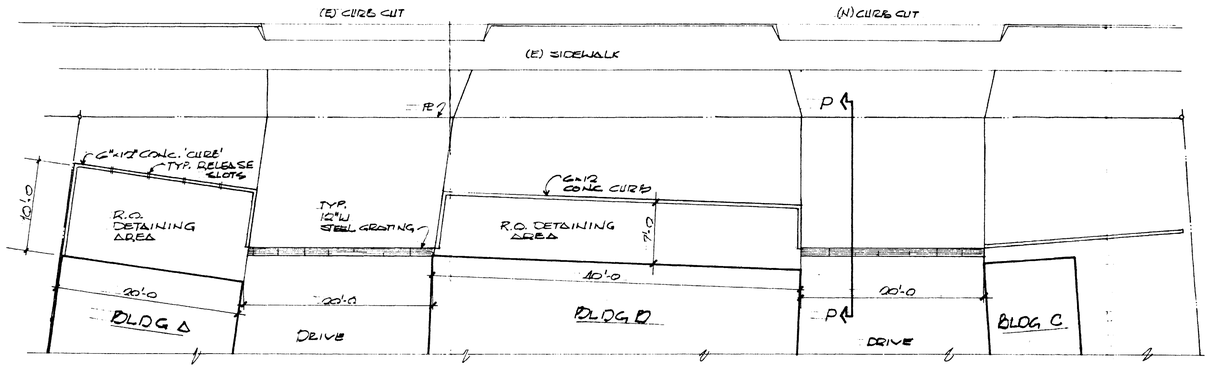
_____

The following action will be taken:

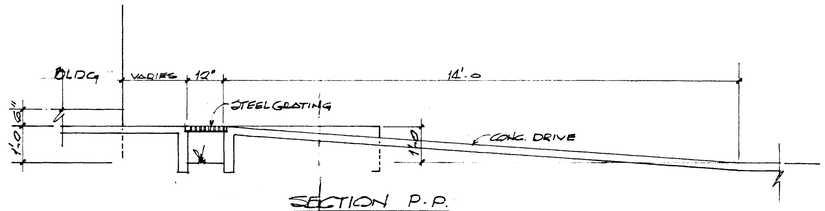
- ☒ The City will release the Certificate of Occupancy (C.O.) after correction of all deficiencies.
- ☐ The City will release the C.O. once an Improvements Guarantee is executed with the City in the amount of the deficient improvements.
- ☐ The City will authorize the issuance of a Temporary C.O. for a period of ____ days ending on _____ . Either (1) all required deficiencies must be corrected or (2) an Improvements Guarantee equal to the value of the improvements must be executed with the City prior to expiration of the Temporary C.O.

It is suggested you contact the Community Development Department (phone: 244-1430) to determine the action required to resolve all outstanding items. Please have your project number and name of staff planner (listed at top of form) available when you call.

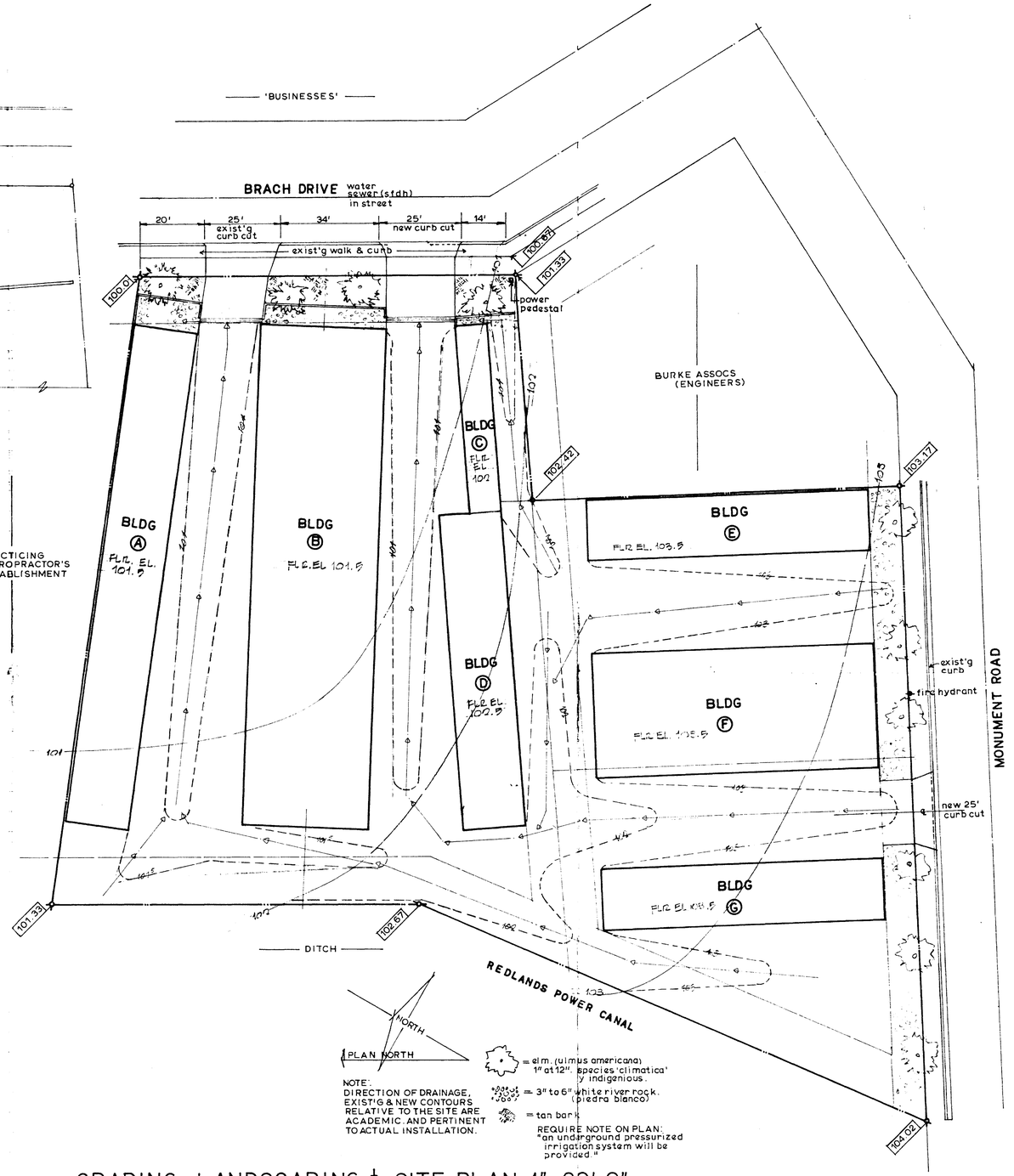
cc: Building Department
City Development Engineer
C.O File/File SPR-95-60 (h:\cityfil\1995\95-606.wpd)



R.O. DETAINING AREA PLAN
1/8"=1'-0"



SECTION P.P.
1/2"=1'-0"



GRADING, LANDSCAPING & SITE PLAN 1"=20'-0"

see bldg size, boundary dims, easmts and other information normally shown on a plot plan ON THE PLOT PLAN

REVISED

STORAGE UNITS
FOR
LOUIS BRACH
PIONEER VILLAGE SOUTH
GRAND JUNCTION, COLORADO
ALCO BUILDING COMPANY 242-1423

DATE: 02/27/95	DRN: AR	CHKD: R.V.	REVISD:

SHEET 2 of 5