Appendix II-Drainage Plan

Introduction

This airport drainage plan is a very general look at potential impacts the proposed airport improvements may have on the surrounding area and typical facilities which will be required to maintain adequate drainage within the airport.

No attempt has been made to size or dimension possible drainage features or to determine all locations where drainage facilities will be needed. The plan is intended only to identify general conditions and locations within the airport which may cause drainage problems, and to establish a general approach to the site drainage which may be continued during preliminary and final design of the airport improvements. The drainage improvements identified on the plan are not all which would be required nor is their location final.

Urban Drainage and Flood Control District Study

The majority of the proposed airport development is within the Urban Drainage and Flood Control District (UD&FCD) study area for the Outfall Systems Planning for Big Dry Creek. This study is being done by Muller Engineering Company, Inc., and is in its final stages of completion.

The UD&FCD study is based on ultimate developed conditions in the basin. Detention ponds and channel improvements proposed in the study within and downstream of the airport are all sized for developed conditions.

Several of the recommendations made in the UD&FCD study do not anticipate the proposed airport improvements and should be reevaluated when engineering on the improvements takes place; however, the basic design elements presented by the UD&FCD have been utilized in this drainage plan.

The key element in the UD&FCD study is that the improvements proposed for the downstream tributaries are for developed conditions, therefore on-site detention of airport runoff in excess of historic rates is not required. The only detention identified on the airport plan is that proposed as part of the UD&FCD study. (Any

changes to the UD/FCD study may affect the drainage as proposed in the drainage plan.)

Drainage Plan

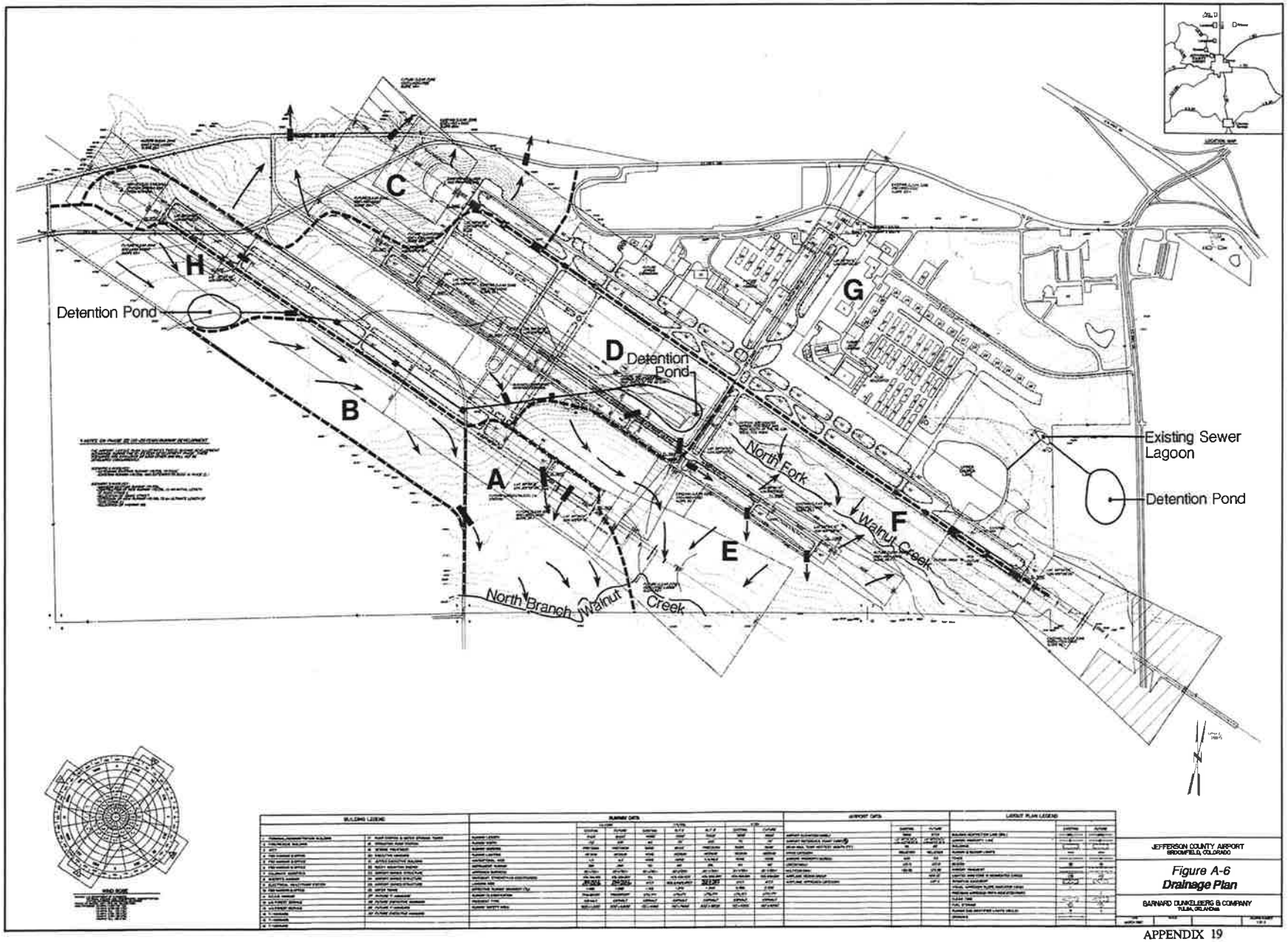
The drainage plan indicates detention ponds proposed by the UD&FCD study as well as typical drainage facilities that will be required as part of the airport expansion. The plan has a number of preliminary drainage basins outlined to facilitate identification of improvements and to reflect estimated boundaries of the UD&FCD study. Listed below are the basic components of the drainage plan.

Basin A. Runoff from Basin A includes sheet flow runoff from south of the proposed southern runway as well as runoff from the east end of the runway. Culverts will be required to drain the area between the runway and taxiway. The final design of the eastern portion of the runway may require relocation of the North Branch of Walnut Creek. If the old embankment of Simms Street is removed, Basin B runoff will sheet flow into Basin A.

Basin B. Runoff from Basin B will flow to the east in a ditch parallel to the proposed southern runway or along future Simms Street. Depending on whether the old embankment for Simms Street is removed, Basin B runoff will sheet flow or flow by culvert to Basin A.

Basin C. Basin C is not contained in the UD&FCD study area. Drainage for the majority of Basin C remains in its present condition after airport improvements have been made. Relocation of State Highway 128 will require installation of culverts under Highway 128 at its new location. The number of culverts will be dependent on final grading of the Basin.

Basin D. Basin D includes portions of runways, aprons, taxiways, areas of aviation developments and open areas. Much of the UD&FCD study proposed improvements fall within Basin D. As stated previously, a number of drainage facilities proposed by the UD&FCD study are in conflict with the airport master plan. For example, in areas where future airport development is proposed, the UD&FCD study has shown open channels to be located. Some pipe sizes indicated in the UD&FCD study may also need to be revised because what was proposed to be conveyed overland may need to be collected and



JEFFERSON COUNTY AIRPORT
BROOMFIELD, COLORADO

Figure A-6
Drainage Plan

BARNARD DUNKELBERG & COMPANY
TULSA, OKLAHOMA

conveyed in a larger storm sewer system. Before design of the airport or the UD&FCD proposed drainage facilities, these conflicts must be resolved.

Basin D and Basin H contain two detention ponds interconnected by open channels and closed conduits. All Basin D runoff reaches the downstream detention pond. The pipe connecting the detention ponds bisects the basin which will allow inlets over the pipe to be used to drain areas between the runway and taxiways. If the area between the runways is developed for "aviation development", an internal storm sewer system may be necessary.

As in the other basins, numerous culverts will be required to drain the sumps in the open areas formed of the intersecting runways and taxiways. The preliminary and final design of Basin B must convey runoff to the lower detention pond to conform to the UD&FCD study.

Basin E. Runoff from Basin E consists predominantly of sheet flows from the runway embankment slopes. Culverts may be required to drain the area between the runway and the taxiway as shown. As stated in the Basin B description, the North Branch of Walnut Creek may need to be relocated depending on the final design of the east end of the south runway.

Basin F. Runoff from Basin F drains to the North Fork of Walnut Creek. The UD&FCD study maintains the natural channel in this area with the addition of grade control structures located along the creek as necessary to control erosion.

Basin G. Runoff from Basin G drains to a series of detention ponds proposed by the UD&FCD study. The study proposes to use the pond presently used by the airport as a sewage lagoon for stormwater detention. This is a conflict which needs to be resolved. The other ponds proposed by the UD& FCD study do not appear to be in conflict with the airport master plan and should be considered in the design of the airport drainage.

Basin H. Basin H runoff sheet flows to the east to the detention pond at the east end of the basin.

As development of the airport proceeds, runoff will increase with increased basin impermeability. Design of drainage facilities in this area should include reviews and coordination with the proposed UD&FCD improvements.

Cost

The drainage cost is based on the following:

1. Muller Engineering Company Inc. cost estimate for the improvements proposed in the UD&FCD study (adjusted for obvious conflicts with airport improvements).

2. Rough estimate of culverts required for internal runway and apron drainage.

3. Costs for unimproved ditches which would be constructed as part of the overall site grading are not included.

4. Cost for storm sewer systems which would be part of the aviation development areas are not included.

5. Land costs are not included.

A rough estimate of the costs of drainage improvements is $2,600,000.