SCOTT BILL BEN BOB DAVID BARB FRANK R. DAVE B. MARK JERRY PAUL KEVIN FRANK D. ANNE DEB CINDY GALENE BRENT MIKE J. MIKE K. DAN LIBRARY FILE DISCARD
Paul - let's bring those slong when we meet with Dick P. Councilman
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Leonard Rice Consulting Water Engineers, Inc.

(303) 455-9589 / 2401 Fifteenth Street, Suite 300 / Denver, Colorado 80202-1143

Leonard Rice Leslie H. Botham

Gregg S. Ten Eyck

DATE: June 22, 1987

Job No.: 444UDD08

TO:

Mr. Bill DeGroot

Project:

Flood Documentation

Urban Drainage and Flood Control District 2480 West 26th Avenue, #156B

Denver, Colorado 80211

Bill: G*et*Vt/V*et*Ne/17/

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Flood Documentation and slides of June 8, 1987 - Lena Gulch and Tributary "G" flooding

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LEONARD RICE CONSULTING WATER ENGINEERS, INC.

By: Veslie H. Botham

Leslie H. Botham, Vice-President Receipt Acknowledged

Hydrology Water Rights Environmental Analysis Urban Drainage



TO:

Urban Drainage and Flood Control District

File 444UDD08

FROM:

Keith Buckley/Hydrogeologist

Dave Park/Hydrologist

DATE:

June 19, 1987

RE:

Flood Documentation June 8, 1987- Lena Gulch/Trib. "G"

At the request of Bill DeGroot, Urban Drainage and Flood Control District (UDFCD), we investigated the flooding which occurred in Lena Gulch between West 6th Avenue and West 32nd Avenue and Tributary G of Lena Gulch in the Cities of Lakewood and Wheat Ridge.

Our work on June 9th, 1987, consisted of documenting the evidence of flooding through photographs, conversations with local residents and delineating the approximate high water marks where possible. A list describing each slide and copies of the Flood Hazard Delineation maps and Master Planning Maps with high water marks and photograph locations are attached.

1

I. Lena Gulch from below West 6th Avenue to Tributary G (Film Roll A)

Mountain Side Mobile Estates

We first went to Mountain Side Mobile Estates near the intersection of West 6th Avenue and Ulysses Street. Lena Gulch emerges from two-10' x 10' reinforced concrete box culverts under West 6th (see photos #5 and #6) just upstream of the trailer park and runs along the western boundary of the Estates. At the park entrance, off Ulysses, the gulch runs in a small culvert approximately 4 1/2 feet wide by 3 feet high (see photo #3). This culvert became clogged by debris, and water backed up and flowed over and around the entrance. Water ran down the street which parallels Lena Gulch about 6 inches deep (See photos #1-4).

We spoke with Mr. Haubold, the assistant manager of the park. He reported no damage in the park and that residents had reported 6 to 8 inches of water in the streets of the park. Mr. Haubold suspects there was 4 inches of rain because the level of the pool rose 4 inches. He insisted that improvement of the gulch upstream has increased problems in the park. He said they experience flooding in the park at this point whenever there is a 2-inch rain.



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Orion Street (GMA - Dramageway H) see FHAD Dwg H-2-54+ 46

We next went down Lena Gulch to Orion Street. The flow did not overtop the culvert here. There was evidence of water coming down Orion Street from the south and into Lena Gulch (see photo #9). Several people on Orion Street south of Lena Gulch were out cleaning up their yards and the drainage ditch that runs along the east side of Orion Street. Water flowed across their yards a few inches deep and partially washed out some of the 18" driveway culverts. We spoke to Rich Brill, president of Pleasant View Water District and Ray Defler of 940 Orion Street. They felt that the high flow along Orion Street was due to the 48-inch culvert under Colfax Avenue which leads into the Orion Street detention pond (see photo #7). The detention pond outlet's pipe empties into the drainage ditch along Orion Street (see photo #8). No serious damage was reported along Orion Street.

Pleasant View Mobile Home Park (GMA - Drainageway G)

This trailer park at 15150 South Golden Road experienced flooding problems due to tributary "G" overtopping a 60-inch culvert within the park. Tributary "G" enters the park from the south where it emerges from two 6' x 12' RCBC's which run under I-70 (see photo #13). In the middle of the park, the tributary runs below an internal road in a 60" culvert (see photos 10,11,12,14,19). This culvert became clogged with debris including tires, trees, and a hot water tank. The water backed up and washed out the skirting under several trailers and left mud in the yards. Trish Bjornson's (phone #279-2776) mobile home and car were damaged. She lived closest to the culvert on the east bank of the tributary.

At this site we met David Bennetts, field maintenance supervisor for UDFCD. He also took pictures of this area. After leaving the channel of Tributary "G", the water flowed down a cul-de-sac which runs northeast along the base of I-70. Several cars parked along the fence here were flooded with water soaking the floors (see photo 18). At the end of the cul-de-sac the water washed through several occupied lots (see photos 15, 16,17). Near the intersection of Old Golden Road and I-70 at the northeast boundary of the trailer park, the fence was knocked down by the water (see photos 20,21,& 22). The manager of the trailer park, Hal Senters (Phone #279-1784), insisted that the debris which clogged his culvert came from people dumping trash in the tributary upstream of I-70.



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Description of Slides: Roll A (Reshot on June 11, 1987)

Reference Lena Gulch Master Plan Sheet 18 of 21 for photo locations.

- #1 Looking northeast down Lena Gulch just below culvert which goes under entrance to Mountain Side Mobile Home Estates. Water was approximately 6 inches running down street parallel to gulch.
- #2 Looking southwest (upstream) at outlet of culvert under entrance.
- #3 Looking east at culvert inlet. Mud and sand debris on road.
- #4 Looking at the east end of the retaining wall above the culvert inlet showing debris on top of wall. Debris on bushes indicated flow a few inches higher than the top of retaining wall.
- ± 5 Looking south (upstream) into one of two 10' \times 10' RCBC under West 6th Avenue, upstream of Mountainside Mobile Home Estates.
- #6 Looking northeast (downstream) just below West 6th Avenue.
 Bottom of notepad indicates approximate high water mark.
 Keith is standing on drop structure which probably protects sanitary sewer crossing underneath.

Off Map Orion Street Detention Pond

- #7 Orion Street detention pond looking across outlet works to pond. Notebook shows approximate high water line.
- #8 Orion Street detention pond outlet works.

Lena Gulch Master Plan Sheet 16 of 21

#9 Looking at Lena Gulch at Orion Street. No overtopping by Lena Gulch. Much water ran down Orion Street into gulch, as indicated by grass.

Drainageway G Green Mountain Area FHAD Sheet 37 of 82

#10 Looking south at Tributary G upstream from 60" culvert in Pleasant View Trailer Park. Notebook indicates high water line on fence.



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- #11 Looking south upstream of 60 inch culvert.
- #12 Looking north (downstream) at Tributary G, 60 inch culvert.

 Debris has been cleared away.
- #13 Looking south at double 6' x 12' RCBC which carries Tributary G under 1-70 and into trailer park.
- #14 Looking northeast at road over 60 inch culvert.
- #15 Looking north at north end of trailer park. Trailers have had skirts washed out during flooding.
- #16 Looking northwest at northwest end of trailer park.
 Notebook shows highwater mark on fence.
- #17 Looking northwest at northwest end of trailer park. Water reached floor boards of this trailer.
- #18 Looking northwest at fence between trailer park & 1-70. Notebook shows high water line. Cars parked here experienced interior flooding.
- #19 Looking north (downstream) from above 60 inch culvert in trailer park. Manager has removed bushes in attempt to decrease debris clogging and diverting flow down the streets.
- #20 Looking west along fence between trailer park and Old Golden Road at northwest end of Pleasant View Trailer Park. Fence was knocked down by flooding. Hand shows approximate depth of water in this area.
- #21 Looking east at same site as #20.
- #22 Looking south at same site as #20, 21.
- II. Lena Gulch from Tributary "G" to Youngfield Street (Film Roll B)

Confluence of Tributary "G" and Lena Gulch near Isabelle Street

Tributary "G" joins Lena Gulch at Isabelle Street, it is a broad low area which experienced flooding from the June 8th storm but because it is undeveloped pasture, no heavy damage occurred. On the north side of 13th Avenue at Isabelle Street, the water reached above street level (see photo #2). The culvert under Isabelle was not sufficient to carry the flow of Lena and



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Tributary "G". Water flowed approximately 3 feet deep above the road at the culvert (see photo #13 & 14).

Water was too high in Tributary "G" to remain in the channel down to the culvert at Isabelle, instead it rushed over Isabelle about 100 feet south of the culvert (see photo #15). East of Isabelle Street and south of 13th Avenue, the water covered a broad area over 120 feet wide, (see photos #9-13) gradually narrowing to the inlet into the improved channel of Lena Gulch built by Denver West (see photos #7 & 8). There were no problems at the drop structure at the end of 13th Avenue and the beginning of the improved channel through Denver West (see photos #3-6).

Denver West

The wide channel of Lena Gulch through Denver West before it crosses under 1-70 was more than able to carry the flow from the June 8th storm (See Photo #16). However, south of I-70 below Eldridge Street, the channel banks were eroded (See Photo #17-19). A track-mounted back-hoe was working to place boulders in the channel to protect the banks. Dave spoke with Denver West maintenance managers, Les Poechell and Vince Herrera (232-8100). They had most of the debris cleaned up before we arrived. The ponds in Denver West showed mud high water lines on the grass a foot or two above the crest of the dams (see photos 20-23).

Lena Gulch at Youngfield Street

Lena Gulch came within a few feet of washing over Youngfield Street (see photo #24). Water backed up (approximately 10 feet) behind the road and culvert but because the gulch has high banks here. No property damage occurred.

Description of Slides: Roll B (Shot June 9, 1987)

Reference Lena Gulch Master Plan Sheet 15 of 21

- #1 No photo
- #2 Looking East up 13th from corner of Isabelle. Note high water mark in grass.
- #3 Lena Gulch just as it enters Denver West Complex property at the east end of 13th Street. Photo looking East.
- #4 Same site as 3, looking south. (downstream)



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- #5 Same site as 3, looking southwest. (upstream) notice debris in barbed wire fence.
- #6 Same site as 3-5 looking southeast. Notebook shows approximate high water line.
- #7 Looking downstream (east) at Lena Gulch before it drops into Denver West property.
- #8 Looking upstream (west) at same site as #7.
- #9 Looking north at debris in side channel of Lena Gulch along 13th Street (approximately) 150 feet east of Isabelle) backed up by barbed wire fence, debris piled up approximately 7 feet high. Channel 65 feet across.
- #10 Looking across channel (north) approximately 150 feet down Lena Gulch from Isabelle Street. Approximately 100 feet wide.
- #11 Looking upstream (west) at same site as #10.
- #12 Looking across channel (north) approximately 100 feet down Lena Gulch from Isabelle Street. Approximately 120 feet wide.
- #13 Looking west upstream at Lena Gulch Culvert under Isabelle Street. Dave shows high water line on barbed wire with notebook.
- #14 Looking north at Lena Gulch culvert inlet. Water washed over Isabelle Street as high as the barbed wire. The wire has been clipped here probably because it was pushed into the road.
- #15 Looking west from Isabelle matted grass indicates high point of water flowing across Isabelle.

Lena Gulch Master Plan Sheet 14 of 21

#16 Photo looking south at Lena Gulch, manmade channel between West end of Denver West and I-70. Dave indicates high water mark.

Lena Gulch Master Plan Sheet 13 of 21

#17 High water mark on Lena Gulch in Denver West approximately 200 feet upstream of first (upper) pond.



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- #18 & #19 Lena Gulch just upstream of first (upper) pond in Denver West. Channel was heavily eroded (from south bank).
- #20 Dam for first (upper) pond in Denver West. Mud on grass indicates high water line (from south bank).
- #21 Second Lake in Denver West (from south bank).
- #22 Dam for 2nd pond. Water ran over dam at least 1 1/2 feet deep.
- #23 Dave shows big water mark in grass above second pond near dam (looking south from dam culvert inlet).

Lena Gulch Master Plan Sheet 12 of 21

- #24 Lena Gulch box culvert under Youngfield Street. Dave points to approximate high water line. Water backed up behind Youngfield culvert but channel has very high banks here so no property damage occurred.
- #25 No photo
- #26 Lena Gulch just below Youngfield, matted grass shows water line.
- III Lena Gulch at Alkire Street, 20th Avenue, and 32nd Avenue (Roll C)

Lena Gulch at Alkire

There were no problems evident at Alkire Street. Water remained within the channel (see Photo #2).

Lena Gulch at 20th Avenue

Lena Gulch at 20th Avenue caused extensive damage to two residences and to 20th Avenue itself. Water flowing over 20th, washed out the downstream side of the road embankment, undercutting the north shoulder and part of the north lane of 20th Avenue (see photos 3-8). A resident reported that water flowed three to four feet deep across 20th Street. From debris in the fence on the upstream side of 20th, water was flowing at least two feet deep across 20th (see photos 12-14). Water flowing across 20th on the west side of the channel washed into the driveway of the residence on the north side of 20th. The fence between this driveway was undercut by the force of water rushing back into the channel (see photos #15, 4, & 7).



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Just upstream of the 20th Avenue culvert, two homes on the east bank of Lena Gulch were heavily damaged. The Barnhart family residence at 1975 Winfield Avenue (second house south of 20th on east bank of Lena Gulch) experienced five feet of water in the backyard at the rear of the house (see photos #16, 17, & 18). Along the backyard fence, we measured a water height of 8 1/2 feet (see photos #19 & 20). Mr. Barnhart (phone #237-2842) reported that Mr. Ed McCallis, a neighbor, measured 2 1/2 inches of rainfall in 25 minutes during the peak of the storm. This is the third time Mr. Barnhart has been flooded in eleven years but this is the worst. He was very cooperative and would be receptive to being contacted for further information.

The Loper family residence at 1995 Winfield (first house south of 20th on East bank of Lena Gulch) also experienced five feet of water in the lower level of the house (see photo #23). Mr. Loper reported that this was the fourth time his home was flooded since 1961. He said that the culvert quickly became clogged with debris during the storm. He was promised by the City that a bridge would be built over Lena Gulch at 20th, after the last flood. Mr. Loper's phone number is 232-8472.

Upstream of 20th Avenue, approximately 500 feet, there is a small USGS streamgage with a flume height of 2 1/2 feet. Water in Lena Gulch here was at least 8 feet above the channel bottom (see photo #21).

Lena Gulch at 32nd Avenue

Water did not exceed the channel capacity here. A resident reported fluctuating water levels in the channel due to reservoir operations at Maple Grove Reservoir (see photo #24).

Description of Slides: Roll C (Shot on June 9, 1987

Reference Lena Gulch Master Plan Sheet 12 of 21

- #1 No Photo
- #2 Lena Gulch at Alkire Street looking southwest, matted grass shows high water mark.

Lena Gulch Master Plan Sheet 11 of 21

- #3 Lena Gulch at 20th (looking east) showing damaged road.
- #4 Fence on west bank of Lena Gulch just north of 20th, washed out from under by street flow which followed residential



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driveway.

- #5 From west bank of Lena Gulch looking upstream at 20th Street culvert damage.
- #6 Same site as #5 looking east across Gulch.
- #7 Looking west at fence in #4.
- #8 Looking south at 20th Street damage.
- #9 Lena Gulch inlet to Maple Grove Reservoir showing west bank.
- #10 No photo
- #11 Lena Gulch inlet to Maple Grove Reservoir showing west bank.
- #12 Looking north from 20th down into Lena Gulch. Fence post was pulled down by water flowing over 20th.
- #13 Looking south up east bank of Lena Gulch from 20th Street.

 Dave indicates approximate high water line.
- #14 Same as #13 but shifted a few feet to show debris in Gulch.
- #15 Driveway of residence on west bank of Lena Gulch, north side of 20th Street. Dave shows water line (looking north). This fence on east side of property is same as photo #4.
- #16-20 Residence of Barnhart family 1775 Winfield Drive (second house south of 20th on east bank of Lena Gulch).
- #16 In backyard showing high water line.
- #17 Close up of high water line on windows.
- #18 Firewood floated up on to bushes by flood waters in backyard.
- #19 Backyard 8 foot fence along Lena Gulch easement.
- #20 Same as #19 but further south.
- #21 USGS gage on Lena Gulch approximately 500 feet upstream of 20th Street. Dave shows high water mark.
- #22-23 Residence of Loper family 1995 Winfield Drive (First house south of 20th on east bank of Lena Gulch.
- #22 Photo looking north in backyard toward fence along 20th



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showing high water mark.

#23 Looking east in backyard. Dave indicates high water mark on wall. Damaged property in foreground.

Lena Gulch Master Plan Sheet 8 of 21

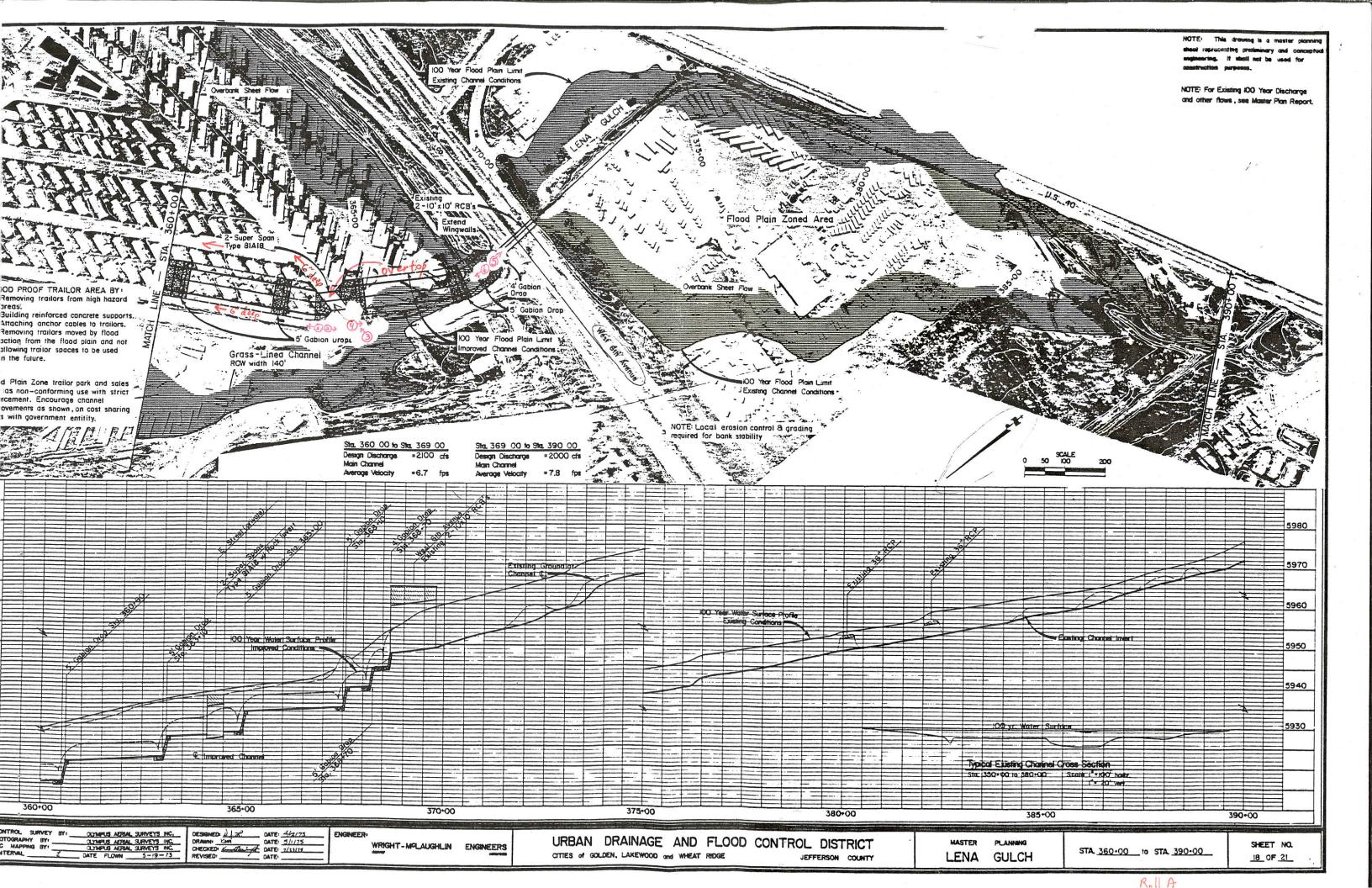
#24 Lena Gulch just upstream of 32nd Street. No overtopping of 32nd Street culvert debris on lawn shows high water mark.

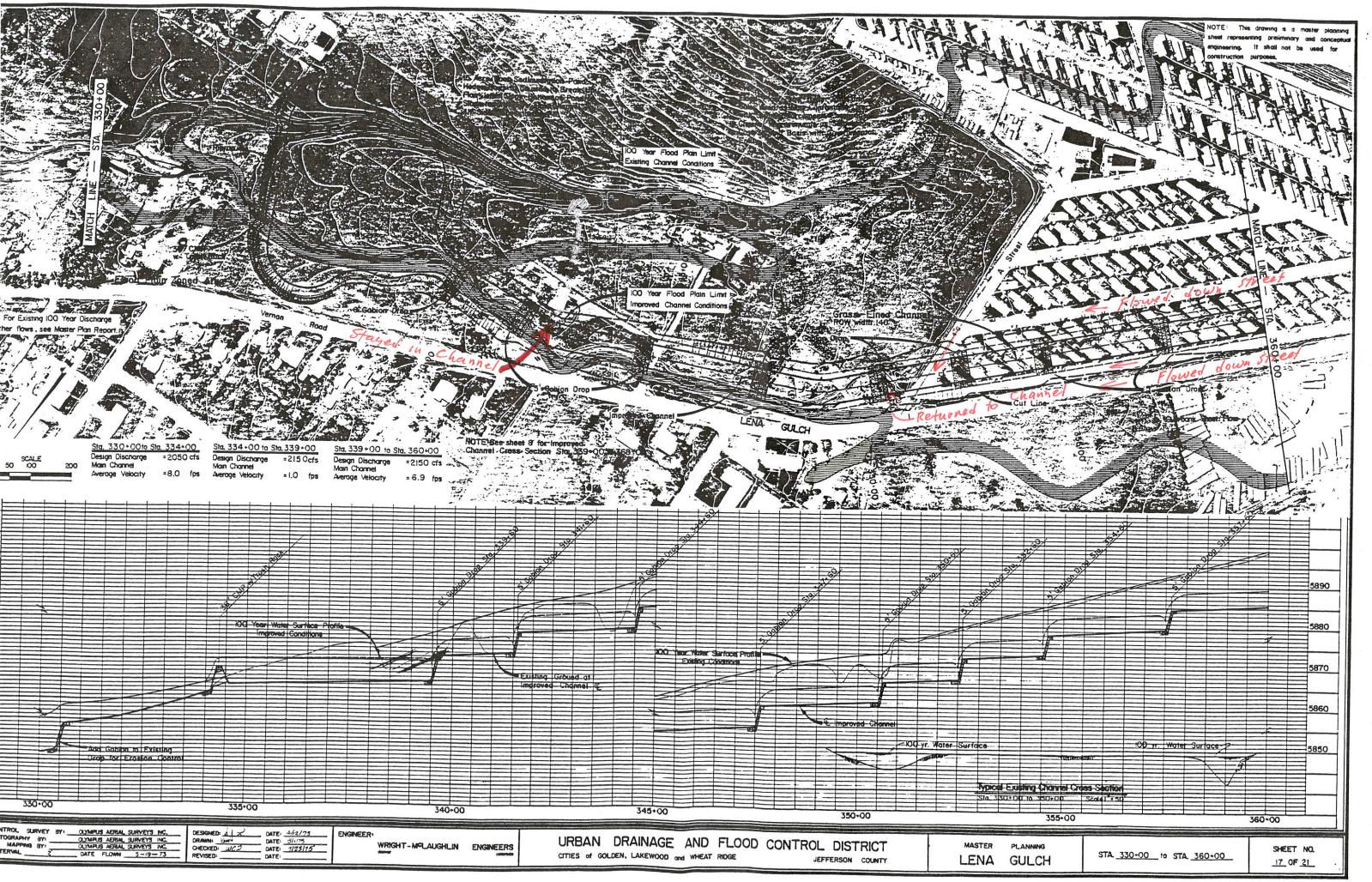
Enclosures

12 UDFCD Drawings

6 sheets of slides







BETENTION POND 100 Year Flood Plain Limit Existing Channel Conditions Grass Lined Channel ROW width 140' Flood Plain Zoned Area Flood Plain Zoned Area 100 yr. Water Surface Typical Existing Channel Cross Section SCALE Typical Improved Channel Cross Section Sta. 305+00 to 324+00 Scale I^T= 20' Sta. 300+00 to 330+00 Sta. 295+00 to Sta. 305+00! Sta. 305+00! to Sta. 315+00 Std. 315 00 to Sta 330+00 Design . Discharge : =2750 cfs Design Discharge = 2500 cf.: Design Discharge #2300 cfs Main Channel Main Channel 5810 Easting Channel Invert 5800 100| Year | Water Surface Profile Improved Conditions 5770 300+00 305+00 325+00 310+00 315+00 320-00 330+00 ONTROL SURVEY BY: OLYMPUS AERIAL SURVEYS INC.

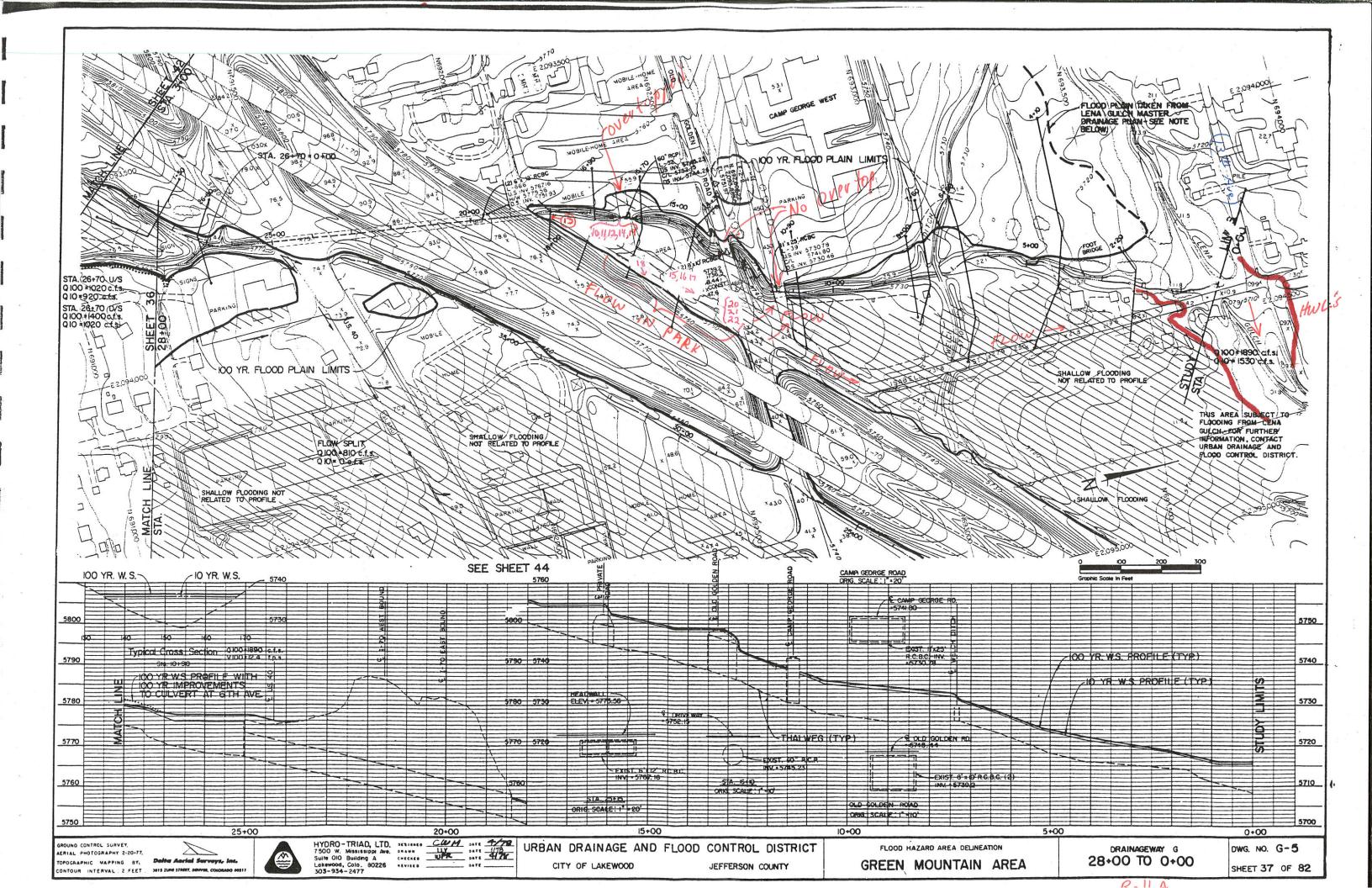
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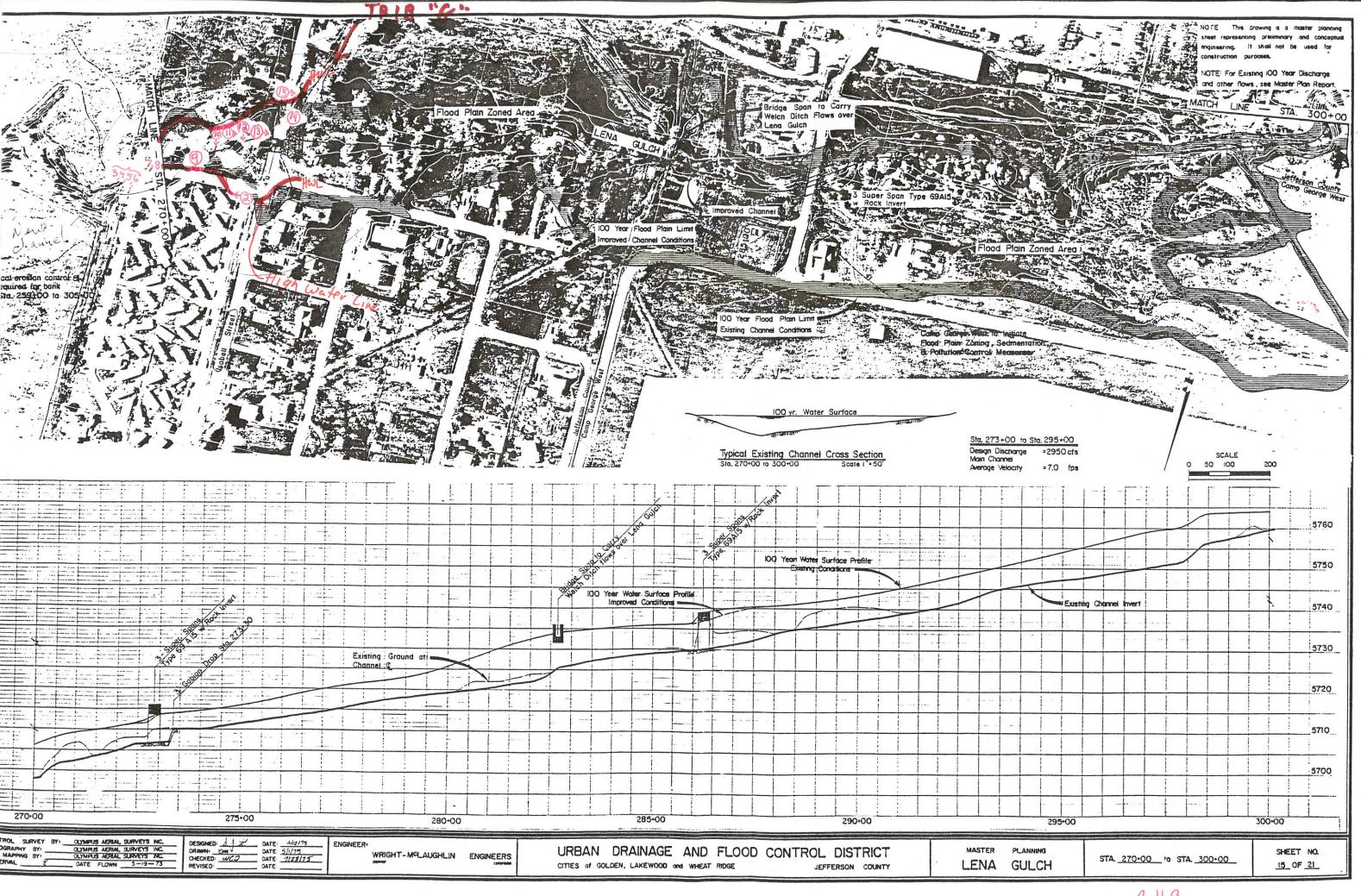
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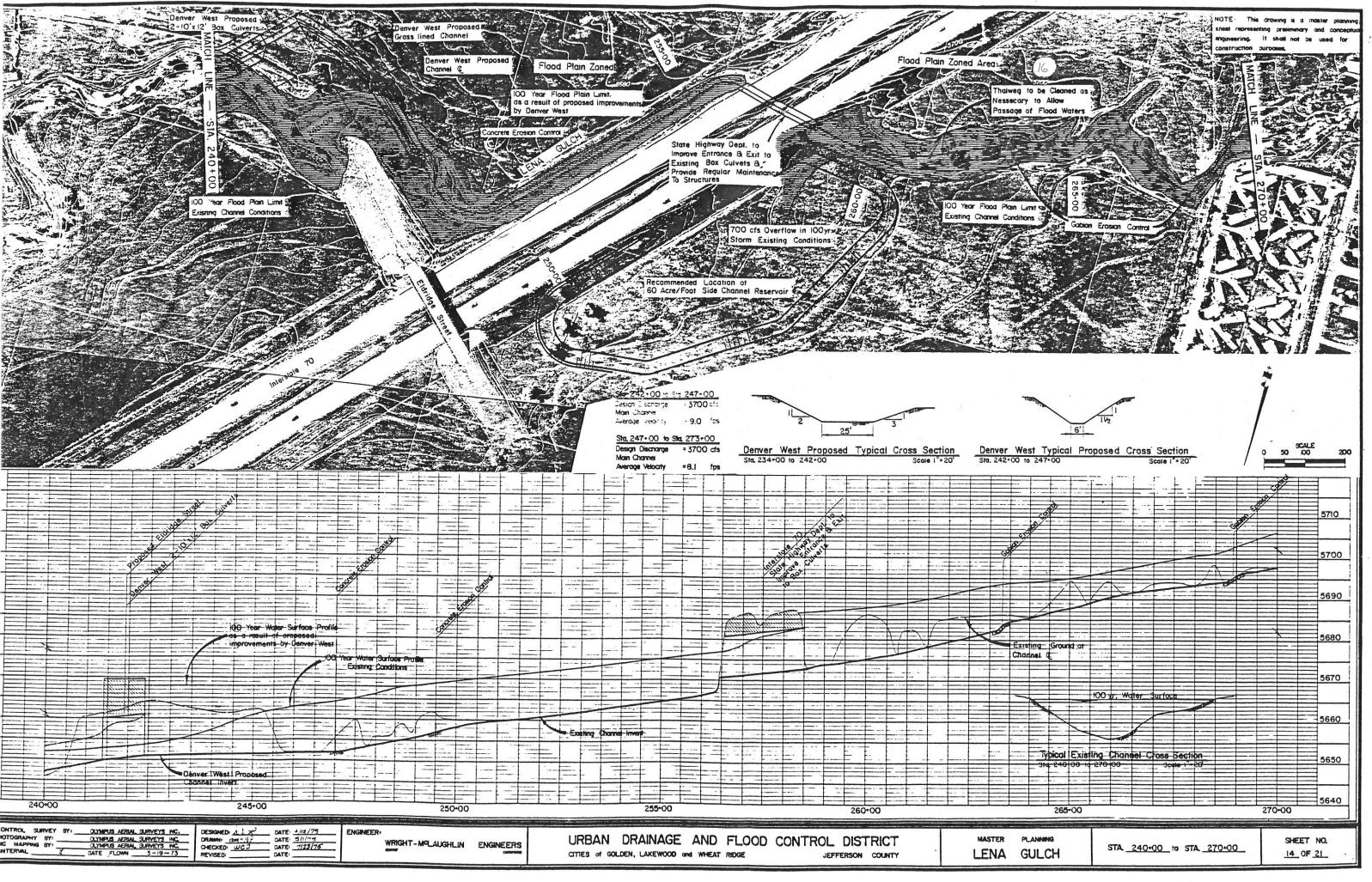
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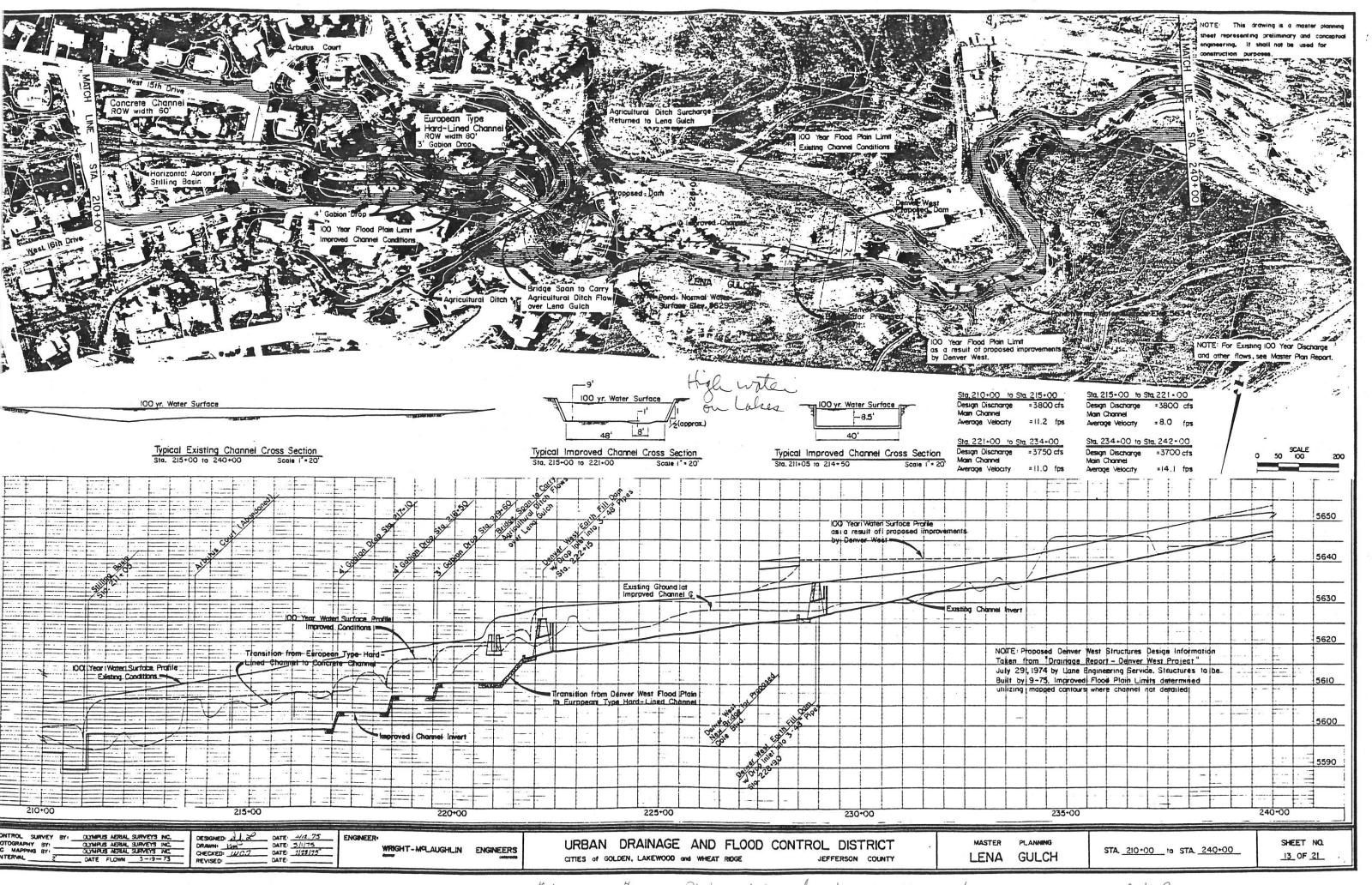
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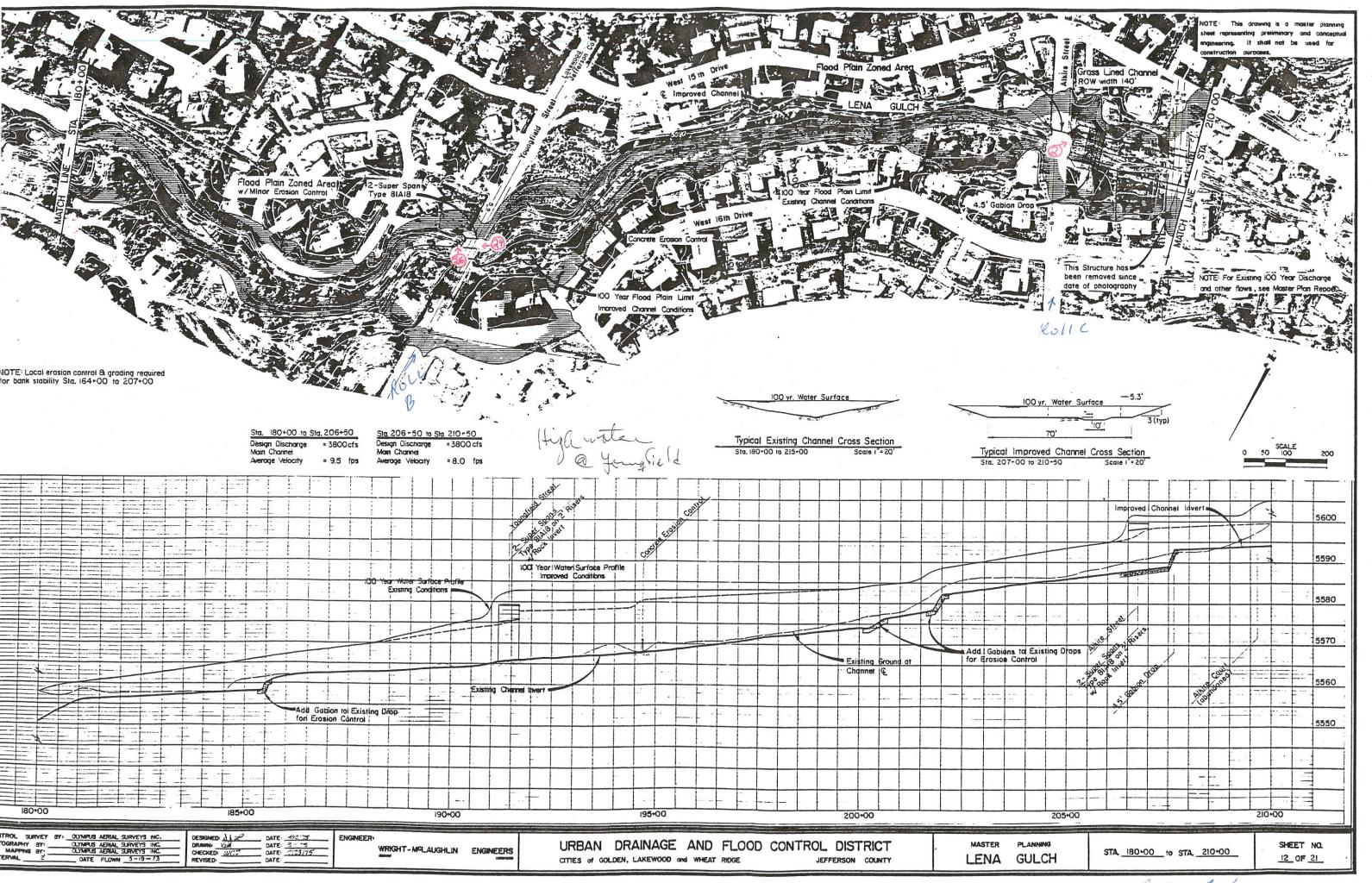
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OATE FLOWN 5-19-73 WRIGHT-MCLAUGHLIN ENGINEERS STA 300+00 to STA 330+00 16 OF 21 LENA GULCH CITIES of GOLDEN, LAKEWOOD and WHEAT RIDGE JEFFERSON COUNTY



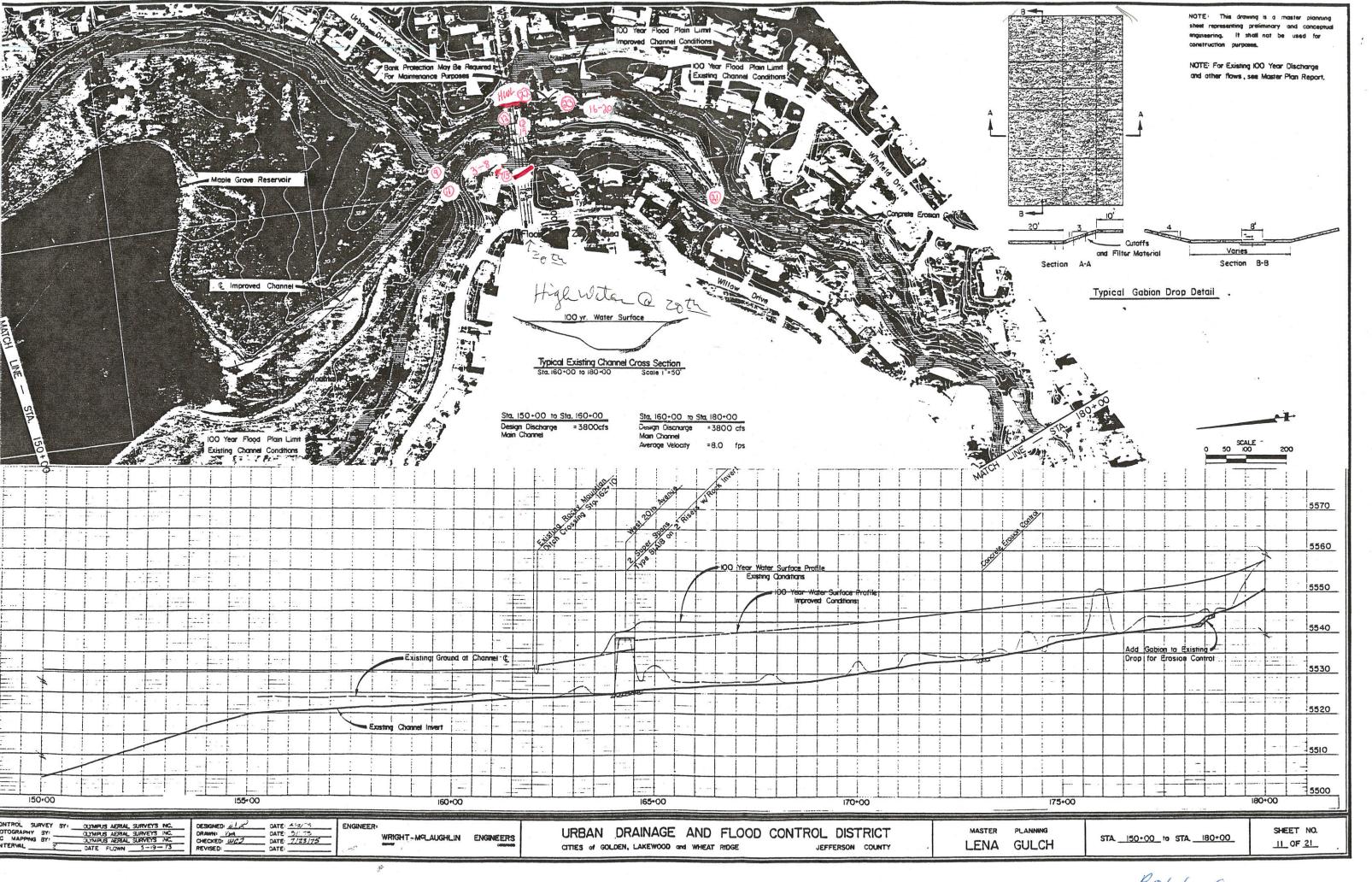




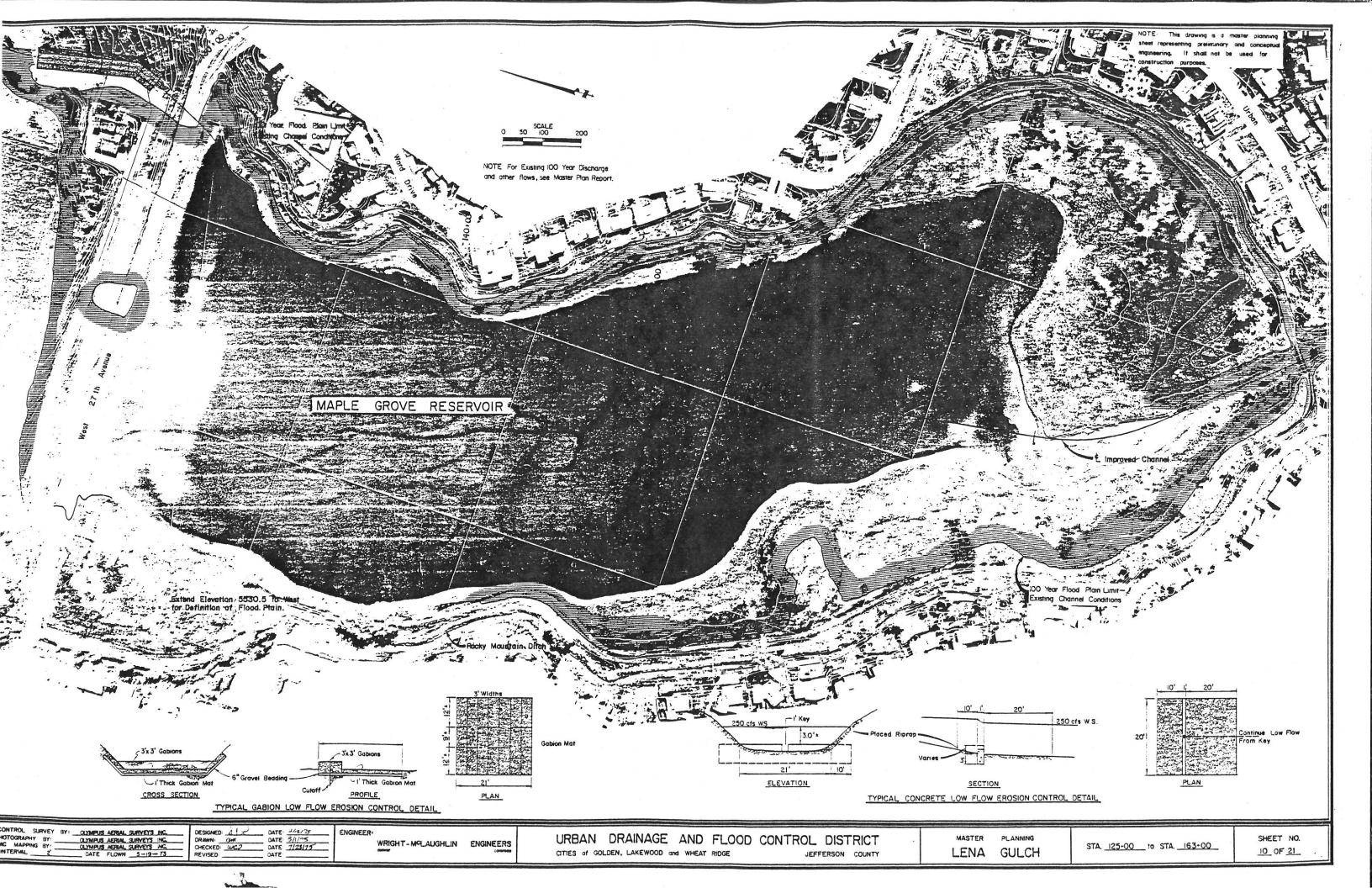


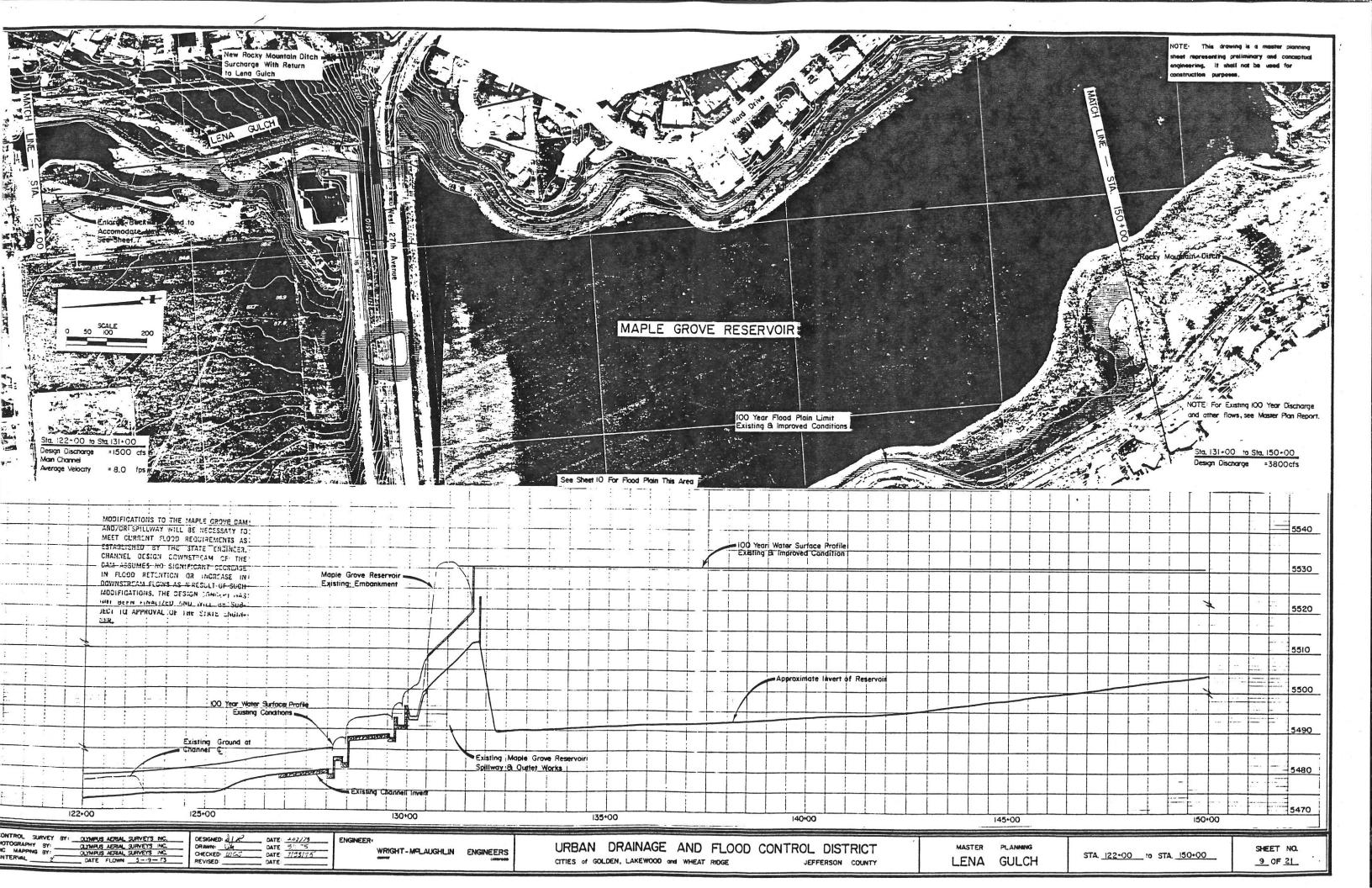


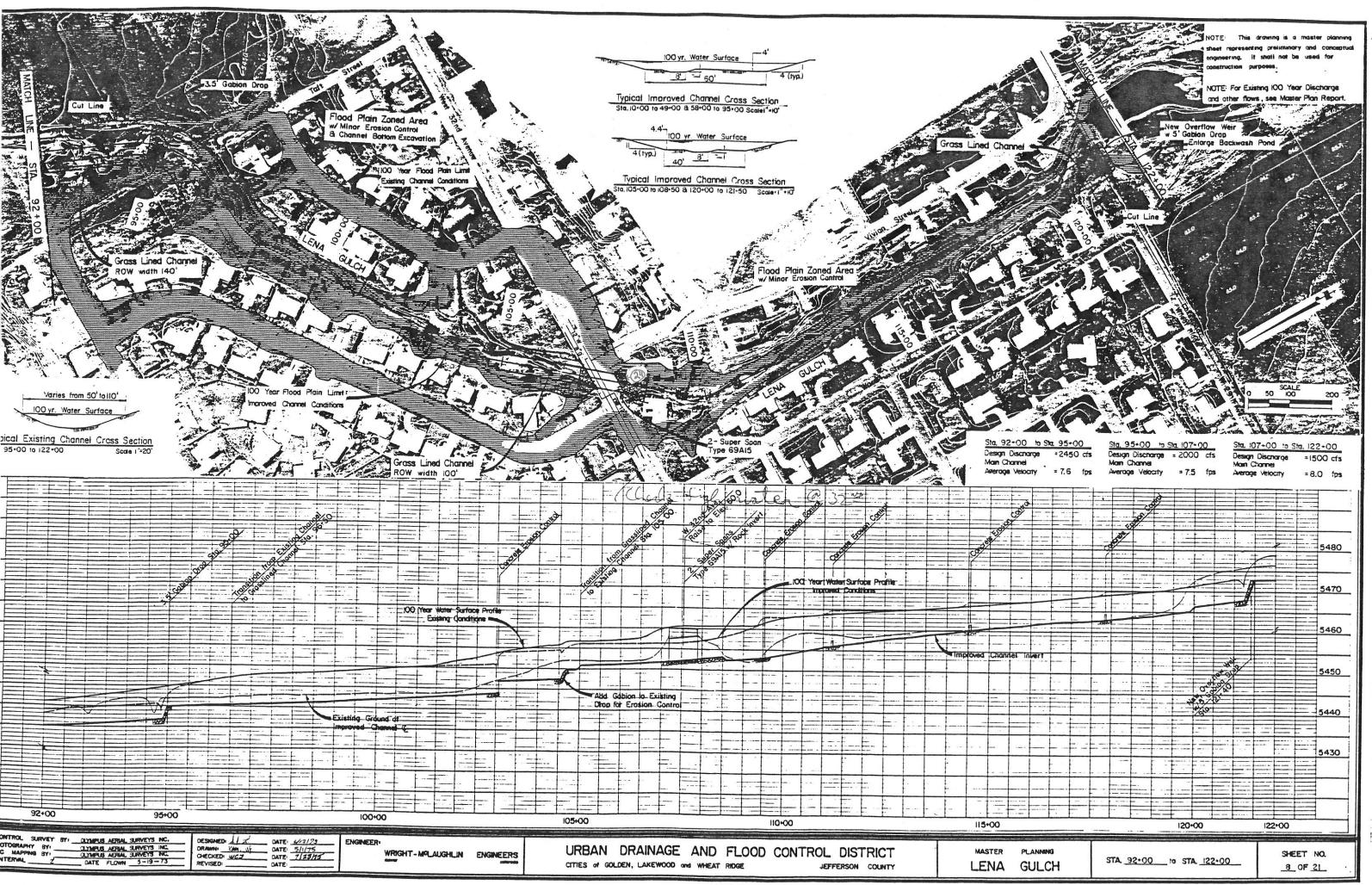
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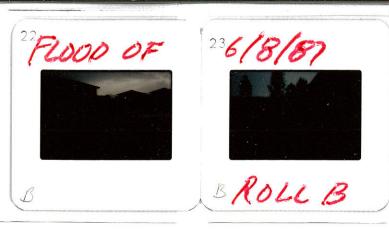
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LENA G. 4 TRIB. "G"









23 FLOOD OF 18/87



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