

Table 6. Preliminary Cost Estimates for the Little Johnson Basin System.
(continued)

Sub-System No.	Item Description	Unit	Estimated Unit Price	Quantity	Item Cost (\$)
9	18-inch RCP	LF	40	150	6,000
	Concrete Low Flow Channel (B=6', D=1.5')	LF	50	300	15,000
	Detention Pond (Includes Earthwork, Outlet, Spillway, and Revegetation)	AF	5,000	15	75,000
	48-inch RCP	LF	110	593	65,230
	48-inch RCP Flare End Section	EA	650	1	650
	42-inch RCP	LF	95	261	24,795
	36-inch RCP	LF	85	426	36,210
	5-ft. Diameter Manhole	EA	2,500	3	7,500
	A. Construction Cost				\$ 230,385
	B. Contingency (5% of Construction Cost)				11,519
	C. Engineering (10% of Construction Cost & Contingency)				24,190
	D. Subtotal				\$ 266,094
	E. Land Acquisition - 2.8 acres @ \$15,600/AC				43,680
	F. TOTAL SUB-SYSTEM 9 COST				\$ 309,774

Pond D Sub-System	Grasslined Channel (B=15', SS=4:1, D=6')	LF	110	3,280	360,800
	Detention Pond (Includes Earthwork, Revegetation and Outlet Structure)	AF	7,000	17	119,000
	A. Construction Cost				\$ 479,800
	B. Contingency (5% of Construction Cost)				23,990
	C. Engineering (10% of Construction Cost & Contingency)				50,379
	D. Subtotal				\$ 554,169
	E. Land Acquisition - 4 acres @ \$15,600/AC				62,400
	F. TOTAL POND D SUB-SYSTEM COST				\$ 616,569

Table 6. Preliminary Cost Estimates for the Little Johnson Basin System.
(continued)

Sub-System No.	Item Description	Unit	Estimated Unit Price	Quantity	Item Cost (\$)
Pond E Sub-System	Grasslined Channel (B=8', SS=4:1, D=4')	LF	50	1,700	85,000
	Detention Pond (Includes Earthwork, Native Grass and Outlet Structure)	AF	7,000	31	217,000
	A. Construction Cost				\$ 302,000
	B. Contingency (5% of Construction Cost)				15,100
	C. Engineering (10% of Construction Cost & Contingency)				31,710
	D. Subtotal				<u>\$ 348,810</u>
	E. Land Acquisiton - 6 acres @ \$15,600/AC				93,600
	F. TOTAL POND E SUB-SYSTEM COST				<u>\$ 442,410</u>
	A. TOTAL CONSTRUCTION COST				\$6,487,945
	B. TOTAL CONTINGENCY (5% OF CONSTRUCTION COST)				324,397
	C. TOTAL ENGINEERING (10% OF CONSTRUCTION COST AND CONTINGENCY)				<u>681,234</u>
	D. SUBTOTAL				\$7,493,576
	E. TOTAL LAND ACQUISITION COST				355,680
	F. STUDY OF BASIN PLAN				<u>34,000</u>
	G. TOTAL DETENTION POND SYSTEM COST				<u>\$7,883,256</u>

Birch Drive. Pipe sizes range from 24-inch to 72-inch diameter. Pipe capacity is the 10-year peak flow. This outfall can be seen on Sheets 18 and 21.

Main Street-Morningside Drive Outfall: The Main Street-Morningside Drive outfall drains the Central Business District and Widefield Drive areas. The system includes storm sewers along Main Street, Morningside Drive, Norman Drive, Widefield Drive, and Pecos Drive. The system is designed to convey the 10-year flow except for the Central Business District where 100-year capacity is provided. Sheets 18 and 22 show this system.

Grand Boulevard Outfall: This system includes 1,100 feet of 30- and 36-inch diameter pipe. The capacity is the 10-year peak flow. Sheet 18 shows the Grand Boulevard outfall.

Security Creek-Fountain Creek Outfall: Security Creek will be diverted through a 144-inch corrugated steel pipe under U.S. Highway 85 and the Atchison, Topeka and Santa Fe Railroad, then flow to Fountain Creek in an 8-foot by 12-foot box culvert. Capacity is the 100-year peak flow. This outfall is shown on Sheet 19.

Widefield Boulevard-Security Creek Outfall: This system includes storm sewers along Widefield Boulevard, Willis Drive, Kiva Road, Amhurst and Fontaine Boulevard. Pipe sizes range from 24-inch to a five-foot by six-foot box culvert. Design capacity is the 10-year peak flow. This system is shown on Sheets 19, 20, and 23.

Widefield Boulevard-Crews Gulch Outfall: The Widefield Boulevard outfall to Crews Gulch consists of 1,940 feet of 48-inch pipe. The design flow is the 10-year peak flow. The storm sewer can be seen on Sheet 20.

Carson Street Outfall: This system which flows to Fountain Creek consists of 30-inch and 42-inch pipe. The capacity is the 10-year peak flow. The Carson Street outfall is shown on Sheet 24.

2. Security Creek System

The existing Security Creek Channel is proposed to be partially reconstructed and regraded from the confluence with Crews Gulch to Cody Drive (Station 164+00) to prevent flood inundation due to the potential occurrence of a major flood. The improvements proposed are described by reach.

Crews Gulch to Fontaine Boulevard: In this segment, it is proposed that a new channel section be constructed from the confluence to the outlet of the existing culvert under Fontaine Boulevard. An eight-foot bottom width, 1:1 side slope concrete channel, with a total depth of five-feet is proposed. This section has the capacity to convey the 100-year flow of 495 cfs without overtopping. The primary reason to reconstruct the channel is to allow for the Widefield/Security storm sewer to enter the channel downstream of Fontaine Boulevard. Riprap bottom and bank protection at the outlet to Crews Gulch has also been considered along with the reconstruction of the headwall on the existing storm sewer under Fontaine Boulevard.

Fontaine Boulevard to Crawford Avenue: Construction within this segment involves the regrading, clearing, and cleaning of the overbank areas adjacent to the existing concrete channel. Because the Widefield/Security storm sewer intercepts the majority of runoff which presently enters the channel upstream of Fontaine Boulevard, the existing channel and culvert at Fontaine are of sufficient capacity to convey the 100-year discharge without overtopping.

Crawford Avenue to Main Street Culvert Outlet: Within this segment of the Security Creek drainageway, the major improvement is a rectangular concrete channel of sufficient capacity to fully convey the 100-year discharge. The channel varies from a 20-foot bottom width, 6-foot depth from the inlet structure at Crawford Avenue (Station 75+75) to the Security Boulevard storm sewer outlet, and a ten-foot bottom width, five-foot depth section to Main Street. The reason to construct this channel is to accommodate the construction of the Grand Boulevard and Security Boulevard storm sewers, and to relieve the 100-year flooding situation depicted on the floodplain maps.

The Crawford Avenue structure is a drop inlet to the proposed 144-inch Security outfall pipe to Fountain Creek. A trash rack and protective railing is recommended to be constructed at this location for safety purpose. Additionally, a new guardrail along Security Boulevard from approximately Station 87+90 to Station 75+35 is proposed. Finally, a six-foot fence from Main Street to the inlet structure is recommended along the east bank. This fence could be constructed of either chainlink or wood.

Main Street to Security Boulevard Storm Sewer (Station 109+79): The segment includes the construction of a new five-foot high by ten-foot wide reinforced concrete box culvert under Main Street, and a rectangular concrete channel with a ten-foot bottom width and a five-foot depth. This construction is made necessary to accommodate the outfall of the Security Boulevard storm sewer into the drainageway at Station 109+20. These improvements are capable of conveying the 100-year discharge with no shallow flooding along the overbanks. A sloped concrete transition upstream of the Security Boulevard storm sewer is proposed to connect the existing concrete channel to the new channel.

Security Boulevard Storm Sewer (Station 109+79) to Station 133+73: The improvements proposed in this reach include the clearing and cleaning of the overbanks adjacent to the existing concrete channel. Because the Security Boulevard storm sewer intercepts the majority of the flow which has historically reached this segment of the drainageway, the existing channel has enough capacity to convey the 100-year discharge through the drainageway without inundating adjacent houses.

Station 133+73 to Station 164+00: This segment of the improvements are essentially the same as proposed by El Paso County for Security Creek (Project No. 3033, Phase B). The proposed channel is a six-foot bottom width, 1 to 1 side sloped concrete swale flowing at approximately four-feet deep. An eight-foot by six-foot reinforced concrete box was constructed in 1987 as part of this project. From the terminus of this project (Station 148+10) to Station 164+00, the existing grasslined swale is proposed to be cleared and grubbed to accommodate the flows entering the drainageway at Cody Drive.

Miscellaneous: Maintenance access to the drainageway is proposed to be provided by means of the existing gravel roadway between the drainageway and the railroad grade. A new gravel trail will be needed from Main Street upstream to approximately Couch Circle. An agreement with the railroad will be needed to ensure that a permanent access to the drainageway is provided. Throughout the length of the Security Creek improvements, overhead electric lines, private fences, and existing storm sewers impact the drainageway alignment. All of these facilities must be protected and kept in service during construction. Relocation of the existing water and gas utilities at Main Street is also anticipated to be necessary.

The storm sewer system cost for the Security, Widefield, and Carson Street Basins are shown on Tables 7, 9, and 11. The Security Creek system cost for the Security Basin and Widefield Basin are listed on Tables 8 and 10.

Basin Fee Determination - Little Johnson Basin

The primary mechanism for the funding of major storm drainage improvements in El Paso County is through the basin fee system. This fee is generally based upon the total system costs divided by total unplatted area within a given drainage basin, as typically depicted with Drainage Basin Planning Studies. To calculate a basin drainage fee by this method for the Little Johnson Basin (as well as for the Security, Widefield, and Carson Street systems) would result in a relatively high basin fee because of the small amount of existing unplatted acreage. For this reason, adjustments to the total cost of the Little Johnson Basin improvement appears reasonable to consider. The adjustments described below have been made in order to more equitably distribute the burden of providing storm drainage facilities for all the land ownerships within the basin.

The area analyzed in the Little Johnson/Security Creek Drainage Basin Planning Study includes both unplatted and platted areas, with the majority (if not all) of the unplatted acreage lying within what has been termed the Little Johnson Basin. In order to begin to establish an equitable drainage fee assessment, the total costs for the Little Johnson system has been distributed using the total acreage tributary to the Little Johnson system.

Table 7. Preliminary Cost Estimates: Security Basin-Storm Sewer System.

Item Description	Unit	Estimated Unit Price (\$)	Total System Cost	
			Quantity	Item Cost (\$)
REINFORCED CONCRETE PIPE				
24-inch	LF	50	570	28,500
30-inch	LF	60	1,490	89,400
36-inch	LF	85	2,260	192,100
42-inch	LF	95	1,730	164,350
48-inch	LF	110	4,580	503,800
54-inch	LF	135	0	0
60-inch	LF	155	1,290	199,950
72-inch	LF	205	1,490	305,450
144-inch CSP (Tunnel)	LF	1,000	200	200,000
CONCRETE BOX CULVERT				
5 ft. x 6 ft.	LF	300	0	0
5 ft. x 8 ft.	LF	325	1,680	546,000
8 ft. x 12 ft.	LF	700	900	630,000
CURB INLETS				
10 ft.	EA	3,000	77	231,000
MANHOLES				
5 ft. diameter	EA	2,500	16	40,000
6 ft. diameter	EA	3,500	25	87,500
Box Base (Junction Structure)	EA	4,500	6	27,000
Inlet Structure	EA	10,000	1	10,000
Outlet Structure	EA	10,000	4	40,000
REMOVE AND RELOCATE EXISTING UTILITIES	LS			<u>380,000</u>
Subtotal				\$3,675,050
Plus Contingency (5% of Construction Cost)				183,752
Plus Engineering (10% of Construction Cost & Contingency)				<u>385,880</u>
TOTAL ESTIMATED CONSTRUCTION COST				\$4,244,682

Table 8. Preliminary Cost Estimates: Security Basin -
Security Creek System.

Item Description	Unit	Estimated Unit Price (\$)	Total System Cost	
			Quantity	Item Cost (\$)
REINFORCED CONCRETE PIPE				
Trapezoidal				
6 ft. x 5 ft.	LF	122	1,387	169,214
Rectangular				
6 ft. x 20 ft.	LF	450	1,211	544,950
5 ft. x 10 ft.	LF	300	2,023	606,900
Channel Rehab	LF	50	4,114	205,700
CONCRETE BOX CULVERT				
5 ft. x 10 ft.	LF	375	220	82,500
CONCRETE STRUCTURE	CY	300	10	3,000
EXCAVATION AND DEMOLITION	CY	5	9,900	49,500
GUARDRAIL AND FENCE	LF	40	1,255	50,200
NEW GRAVEL ROAD	LF	10	3,745	37,450
ROAD REPAIR	LF	4	4,720	18,880
REMOVE AND RELOCATE EXISTING UTILITIES	LS			100,000
Subtotal				\$1,868,294
Plus Contingency (5% of Construction Cost)				93,415
Plus Engineering (10% of Construction Cost & Contingency)				196,171
TOTAL ESTIMATED CONSTRUCTION COST				\$2,157,880

Table 9. Preliminary Cost Estimates: Widefield Basin -
Storm Sewer System.

Item Description	Unit	Estimated Unit Price (\$)	Total System Cost	
			Quantity	Item Cost (\$)
REINFORCED CONCRETE PIPE				
24-inch	LF	50	610	30,500
30-inch	LF	60	1,900	114,000
36-inch	LF	85	670	56,950
42-inch	LF	95	920	87,400
48-inch	LF	110	1,940	213,400
54-inch	LF	135	790	106,650
60-inch	LF	155	1,960	303,800
72-inch	LF	205	0	0
144-inch CSP (Tunnel)	LF	1,000	0	0
CONCRETE BOX CULVERT				
5 ft. x 6 ft.	LF	300	1,010	303,000
5 ft. x 8 ft.	LF	325	330	107,250
8 ft. x 12 ft.	LF	700	0	0
CURB INLETS				
10 ft.	EA	3,000	62	186,000
MANHOLES				
5 ft. diameter	EA	2,500	11	27,500
6 ft. diameter	EA	3,500	10	35,000
Box Base (Junction Structure)	EA	4,500	4	18,000
Inlet Structure	EA	10,000	0	0
Outlet Structure	EA	10,000	2	20,000
REMOVE AND RELOCATE EXISTING UTILITIES				
	LS			200,000
Subtotal				\$1,809,450
Plus Contingency (5% of Construction Cost)				90,472
Plus Engineering (10% of Construction Cost & Contingency)				189,992
TOTAL ESTIMATED CONSTRUCTION COST				\$2,089,914

Table 10. Preliminary Cost Estimates: Widefield Basin -
Security Creek System.

Item Description	Unit	Estimated Unit Price (\$)	Total System Cost	
			Quantity	Item Cost (\$)
REINFORCED CONCRETE PIPE				
Trapezoidal				
8 ft. x 5 ft.	LF	134	3,250	435,500
BACKFILL STRUCTURE	CY	10	2,152	21,520
TYPE H RIPRAP	CY	45	1,750	78,750
CHANNEL REHAB	LF	50	4,140	207,000
ROAD REPAIR	LF	4	7,935	31,740
REMOVE AND RELOCATE EXISTING UTILITIES	LS			20,000
Subtotal				\$ 794,510
Plus Contingency (5% of Construction Cost)				39,725
Plus Engineering (10% of Construction Cost & Contingency)				83,424
TOTAL ESTIMATED CONSTRUCTION COST				\$ 917,659

Table 11. Preliminary Cost Estimates: Carson Street Basin -
Storm Sewer System.

Item Description	Unit	Estimated Unit Price (\$)	Total System Cost	
			Quantity	Item Cost (\$)
REINFORCED CONCRETE PIPE				
30-inch	LF	60	400	24,000
42-inch	LF	95	1,550	147,250
CURB INLETS				
10 ft.	EA	3,000	11	33,000
MANHOLES				
5 ft. diameter	EA	2,500	1	2,500
6 ft. diameter	EA	3,500	3	10,500
Outlet Structure	EA	10,000	1	10,000
REMOVE AND RELOCATE EXISTING UTILITIES	LS			20,000
Subtotal				\$ 247,250
Plus Contingency (5% of Construction Cost)				12,362
Plus Engineering (10% of Construction Cost & Contingency)				25,961
TOTAL ESTIMATED CONSTRUCTION COST				\$ 285,573

As presented on Table 6, the total cost of the Little Johnson system has been estimated at \$7,883,256. This includes all of the costs associated with the permanent major storm drainage outfall facilities as depicted on Sheets 11 through 13 of the preliminary design drawings. Using the total 1425 acres within the Little Johnson Basin, the unit drainage improvement cost is \$5532 per acre.

Various areas within the Little Johnson Basin are platted and have paid basin fees prior to this study. This includes platted areas within the City of Colorado Springs and El Paso County. Table 12 lists the acreages used in determining the basin fee for new development for the Little Johnson Drainage.

Using the information shown on Table 12, the fee has been calculated based upon the percentage of future development's share of the storm drainage improvements. Therefore, the recommended drainage basin fees are:

$$(\$7,883,256 \times .743)/1059 \text{ acres} = \$5532/\text{acre}$$

$$\text{Drainage Fee} = \$7,527,576 \times (.743)/1059 \text{ acre} = \$5,282/\text{acre}$$

$$\text{Land Fee} = \$355,680/1425 = \$250/\text{acre}$$

Table 12. Summary of Acreages - Little Johnson Drainage Basin.

TOTAL BASIN AREA	1425 acres
Total Platted in Little Johnson Basin *	366 acres
NET Unplatted Acreage Subject to Fee	1059 acres
Percent of Basin Platted	25.7 percent
Percent of Basin Unplatted	74.3 percent

* Includes platted or unplattable land such as road right-of-way, park lands.

The unplatted acreage was verified using El Paso County assessors' records. The area subject to this fee is shown on Figure 11 as the Little Johnson Basin.

As can be seen, the total cost of the drainage improvements will not be covered by the basin fee alone. As discussed above, approximately 75 percent

of the improvements will be paid for by the drainage fee system. The remaining 25 percent of the total Little Johnson Basin system cost will have to be paid for through other mechanisms. Examples of this might include capital improvement programs (provided funds exist), public/private mechanisms such as special districts, or storm drainage utility programs. As another example, if the City widens (or participates in the widening of) Drennan Road, the outlet facilities at the Foxhills detention pond could be completed under the widening project, thereby bringing the area currently served by the Foxhills Subdivision drainage system safely into the Little Johnson Basin major drainageway. El Paso County also has an opportunity to upgrade the existing systems, and install new storm sewers as depicted in this plan within the scope of the Hancock Expressway widening project. All future funding must be examined further with respect to cost and the feasibility of implementing the types of mechanisms discussed above.

Drainage Basin Fee - Security and Widefield Gulch Drainage Basin

The calculation of a drainage fee in the Security and Widefield Basins, using similar methods as the Little Johnson Basin, is not practical because of the absence of an unplatted ground tributary to the respective system(s). However, there is a possibility that the less than 20 acres of unplatted ground which is available in each of the Security and Widefield Basins could develop, and therefore a fee was calculated. The basin fee for the Security and Widefield Drainage Basins were based upon the total cost of the stormwater system, minus the cost of the Security Creek outfall facilities, and then divided by the total tributary area, as illustrated below.

Security Drainage Basin Fee:

$$(\$6,402,600 - \$2,157,900)/800 \text{ acres} = \$5306/\text{acre}$$

Widefield Drainage Basin Fee:

$$(\$3,007,600 - \$917,700)/378 \text{ acres} = \$5529/\text{acre}$$

The area subject to this fee is shown on Figure 11.

Drainage Basin Fee - Carson Street Drainage

The system proposed for the Carson Street Basin has been sized to convey future runoff through the existing developed areas of El Paso County and the City of Fountain. There are 256 total acres in the Carson Street Drainage Basin, and approximately 97 acres are unplatted. Using the conventional method of calculating the basin fee, dividing the total system cost by the unplatted acreage, it is as shown below:

Carson Street Drainage Fee:

$$\$285,600/97 \text{ acres} = \$2944/\text{acre}$$

The total cost does not include the cost of minor drainage systems, which are the responsibility of the developer of a given property. The area subject to this fee is shown on Figure 11.

Currently, no agreements exist between the City of Fountain and El Paso County on the administration of a fee system for the Carson Street Basin. Until such an agreement exists it is recommended that the miscellaneous drainage basin fee, as presently calculated by El Paso County Department of Public Works, be assessed against any developing properties within the Carson Street Drainage.

Direct Flow Areas

These basins within the study area lie within the Fountain Creek floodplain area, and would flow directly to Fountain Creek by the use of local stormwater drainage systems. No costs for the local systems have been addressed in this study, and it is recommended that the Miscellaneous Drainage Basin Fee be assessed against properties developing within the direct flow areas.

Because there is no substantial unplatted acreage within the Security, Widefield, or Carson Street storm drainage basins, it will be necessary to fund the construction of the storm drainage improvements via mechanisms other than the drainage fee system. Such mechanisms include capital improvement programs, special assessment districts, or storm drainage utilities. All of these mechanisms will require that further, more detailed designs, be carried out and financial analysis carefully investigated. Severe or chronic flooding

problems within these areas could be eligible to receive federal or state funds through the various block grant programs. Street improvement projects can also be used to provide curbs and gutters where none exist or where they have deteriorated.

Construction Prioritization

Construction prioritization can be considered from engineering, financial, and practical viewpoints for all the drainage basins depicted on Figure 11.

Little Johnson Basin: The proposed drainage facilities for this district emphasizes the utilization of a regional detention pond for the controlling of excess water from future development. Therefore, the first construction priority would be the need for the completion of regional detention ponds and associate outlet facilities. The other sub-systems, which all have drainage connections to the main detention pond system, can be phased out for construction based on the stage of development in the district.

Security Basin: The drainage flow from this district is to be handled by Security Creek and the proposed storm sewer. Construction priority should be given first to the outlet pipe at Crawford Avenue. The second priority will be the completion of the Security channel improvement, and Main Street and Security outfall systems. The remaining portion of the storm sewer system can be phased according to the funding availability.

Widefield Basin: The proposed drainage improvements for this district consists of channel improvements for the Security Creek and storm sewer improvements along Fountaine Boulevard, Widefield Boulevard, and Kiva Road. First construction priority includes the completion of channel improvements for the existing Security Creek and storm sewer improvements along Security Boulevard and Kiva Road. The remaining portion of the storm sewer improvements can be phased according to the funding availability.

Carson Street Basin: Since Carson Street outfall is the only storm sewer improvement proposed for this district, the improvement for this system is pending on the funding availability.

Conclusions and Recommendations

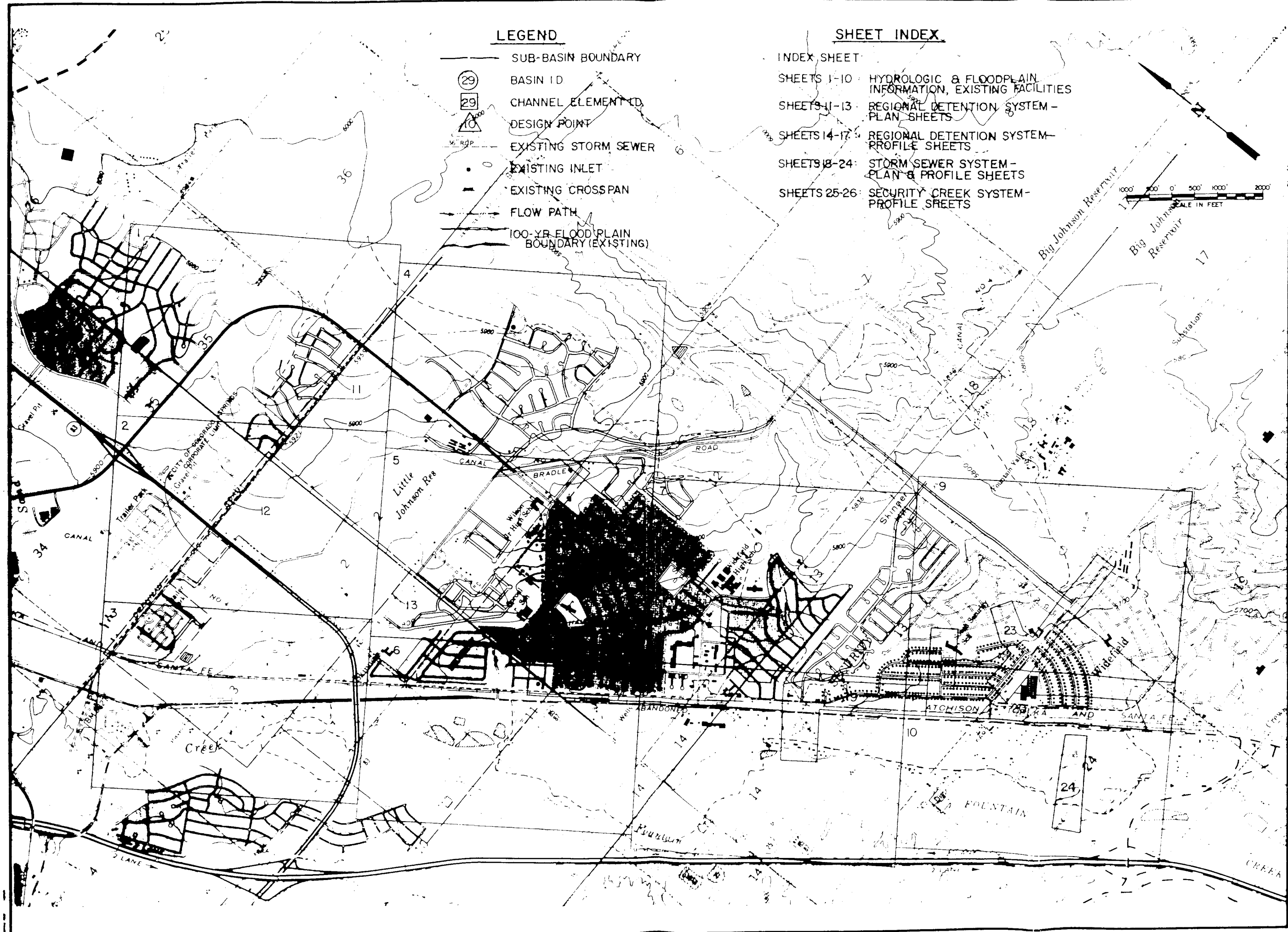
The proposed drainage facilities for the whole study area were planned and the preliminary design was done from the area-wide stormwater management approach. All facilities, as shown in Sheets 11 through 26, are designed by following the Drainage Criteria Manual and coordinated with all sponsoring agencies and private sectors. It was concluded that the Little Johnson Drainage should be separated from the other districts in terms of engineering design and financing mechanism. Proposed improvements for the Security Drainage, Widefield Drainage, and Carson Street Drainage were planned to minimize the existing drainage problems and prevent the potential damage to the community due to a major flood event. As a result of this study, the following recommendations are made:

1. All of the proposed drainage facilities are subject to final design before the start of the construction work. More detailed information on survey, utility location, soil boring, and environmental assessment needs to be thoroughly investigated.
2. Drainage facilities for Sub-System 8, as shown on Sheet 11, are temporary facilities. The planning and final design of this system needs the coordination between property owners.
3. Coordination with the Fountain Mutual Irrigation Company for the planning and design of the canal siphon structure and the canal spill structure is required.
4. The design of Pond D and E sub-systems, as shown on Sheet 12, are for conceptual information due to the current open mining operation. These two sub-systems should be reevaluated when the final land use is determined.

5. Further investigation and evaluation of the available funding mechanism for all four drainage basins is required to assure that the improvements can be constructed.
6. Assess all new development within the Little Johnson/Security Creek Drainage Basins the drainage basin fees recommended herein.

APPENDIX A

**Preliminary Design of Selected Plan
(Sheets 1 through 26)**



LEGEND

- SUB-BASIN BOUNDARY
- (29) BASIN ID
- (29) CHANNEL ELEMENT ID
- △ DESIGN POINT
- EXISTING STORM SEWER
- EXISTING INLET
- EXISTING CROSSSPAN
- FLOW PATH
- 100-YR FLOOD PLAIN BOUNDARY (EXISTING)

SHEET INDEX

- INDEX SHEET
- SHEETS 1-10 HYDROLOGIC & FLOODPLAIN INFORMATION, EXISTING FACILITIES
- SHEETS 11-13 REGIONAL DETENTION SYSTEM - PLAN SHEETS
- SHEETS 14-17 REGIONAL DETENTION SYSTEM - PROFILE SHEETS
- SHEETS 18-24 STORM SEWER SYSTEM - PLAN & PROFILE SHEETS
- SHEETS 25-26 SECURITY CREEK SYSTEM - PROFILE SHEETS

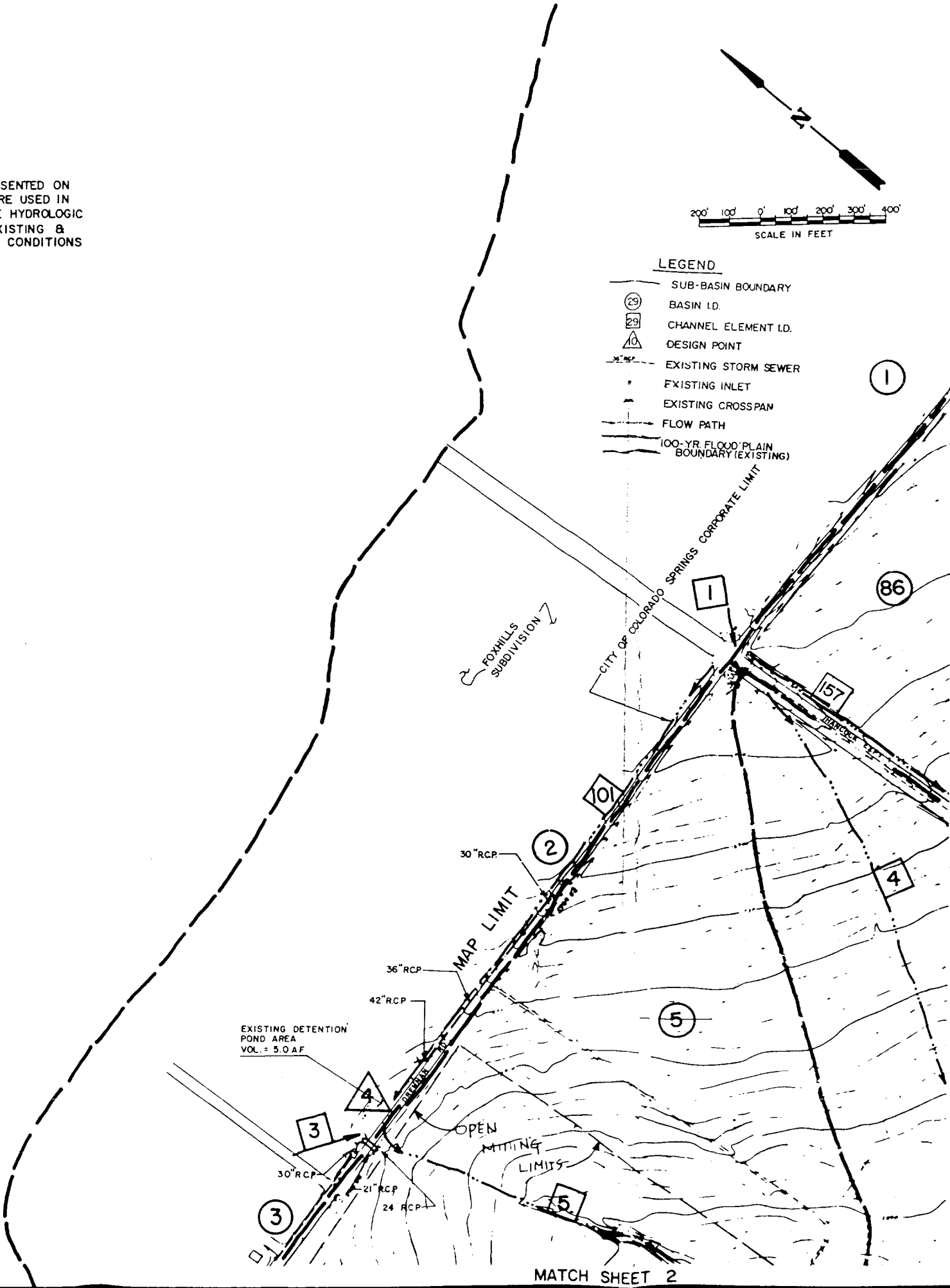
SLA SIMONS, Li & Associates, INC.
419 WEST BIJOU STREET
COLORADO SPRINGS
COLORADO 80905

LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN

Project No.	PCO-EPC-01
Date:	10/87
Design:	JYS
Drawn:	EAP
Check:	JYS
Revisions:	

INDEX SHEET

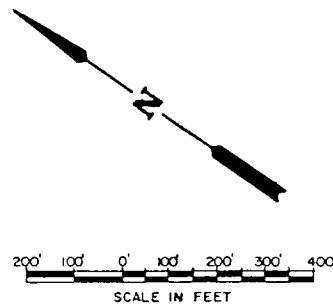
INFORMATION PRESENTED ON SHEETS 1-10 WERE USED IN DETERMINING THE HYDROLOGIC DATA FOR THE EXISTING & PROPOSED BASIN CONDITIONS ONLY.



LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP

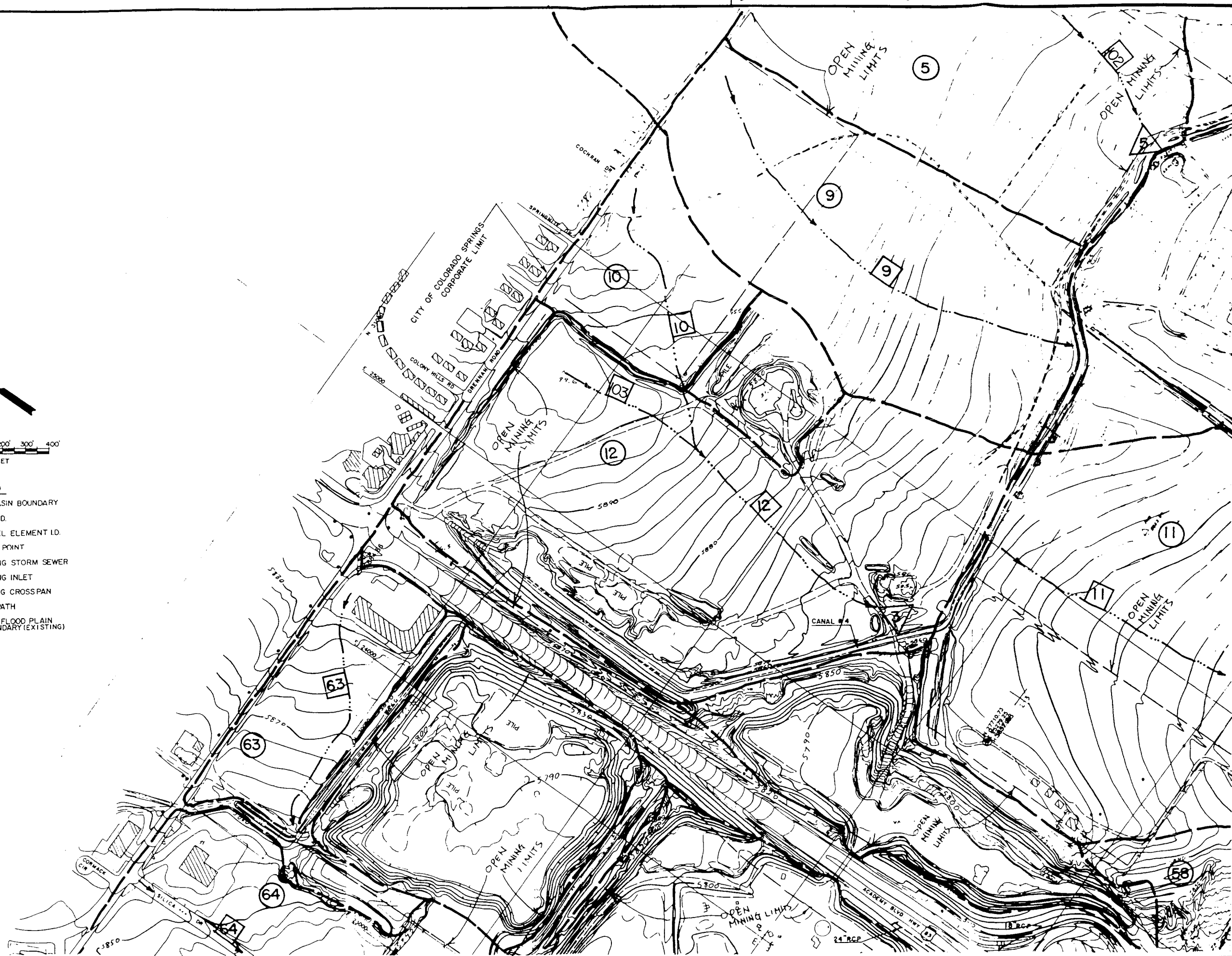
Project No.	PCO-EPC 01
Date:	10/87
Design:	JYC
Drawn:	EAK
Check:	JYC
Revisions:	

SHEET 1



LEGEND

- SUB-BASIN BOUNDARY
- ②9 BASIN I.D.
- ②9 CHANNEL ELEMENT I.D.
- △ DESIGN POINT
- EXISTING STORM SEWER
- EXISTING INLET
- ▲ EXISTING CROSSSPAN
- FLOW PATH
- 100-YR. FLOOD PLAIN BOUNDARY (EXISTING)



MATCH SHEET 3

MATCH SHEET 5

MATCH SHT. 4

LITTLE JOHNSON/SECURITY CREEK

DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP

Project No.	PCO-EPC - 01
Date:	10/87
Design:	JYC
Drawn:	EAK
Check:	JYC
Revisions:	

SHEET 2

SLR SIMONS, LI & ASSOCIATES, INC.
419 West Bijou, Colorado Springs, Colorado 80905

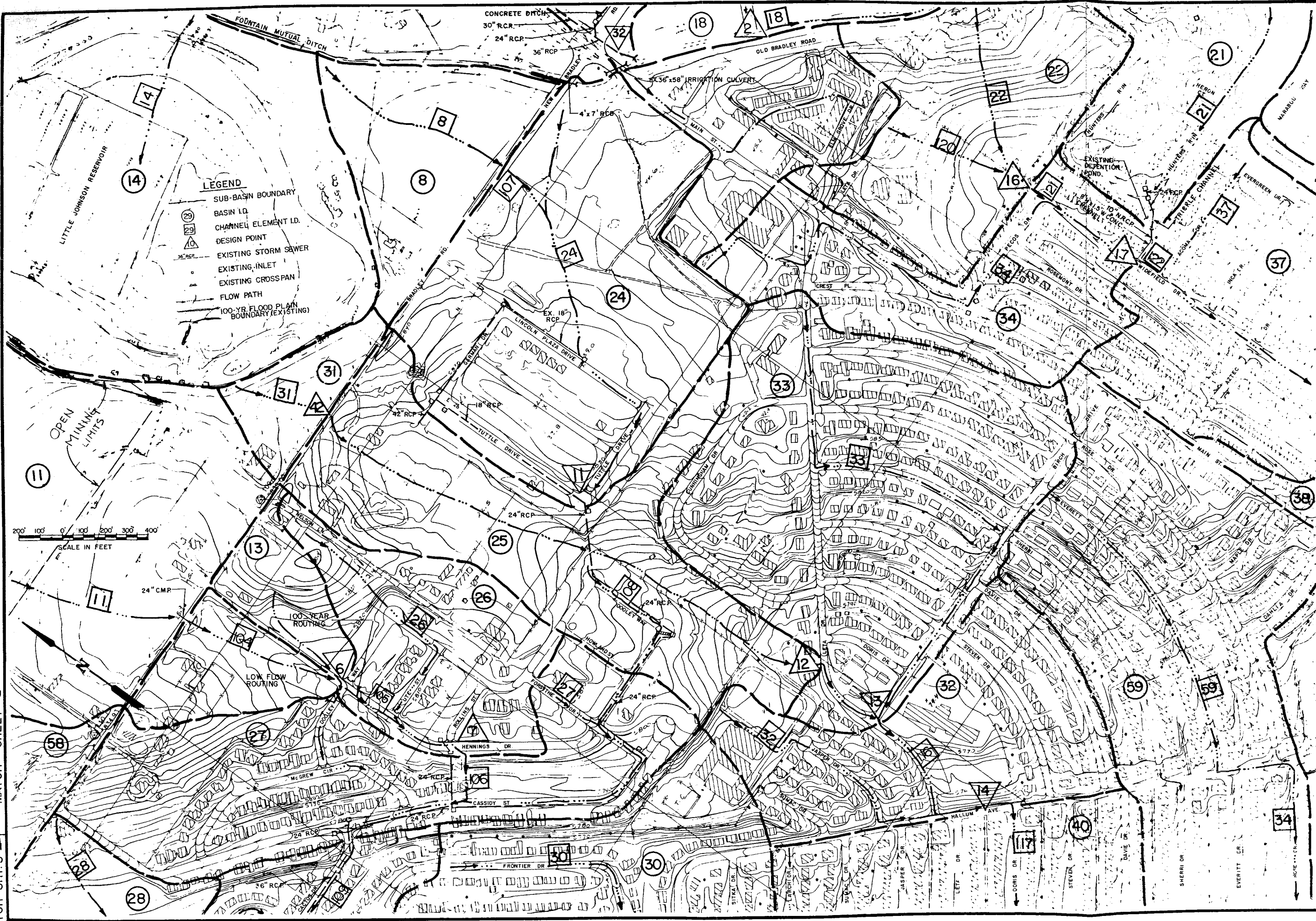
1- MATCH SHT. 5

TES, INC.

**LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP**

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Drawn: EAK
Check: JYC
Revisions:

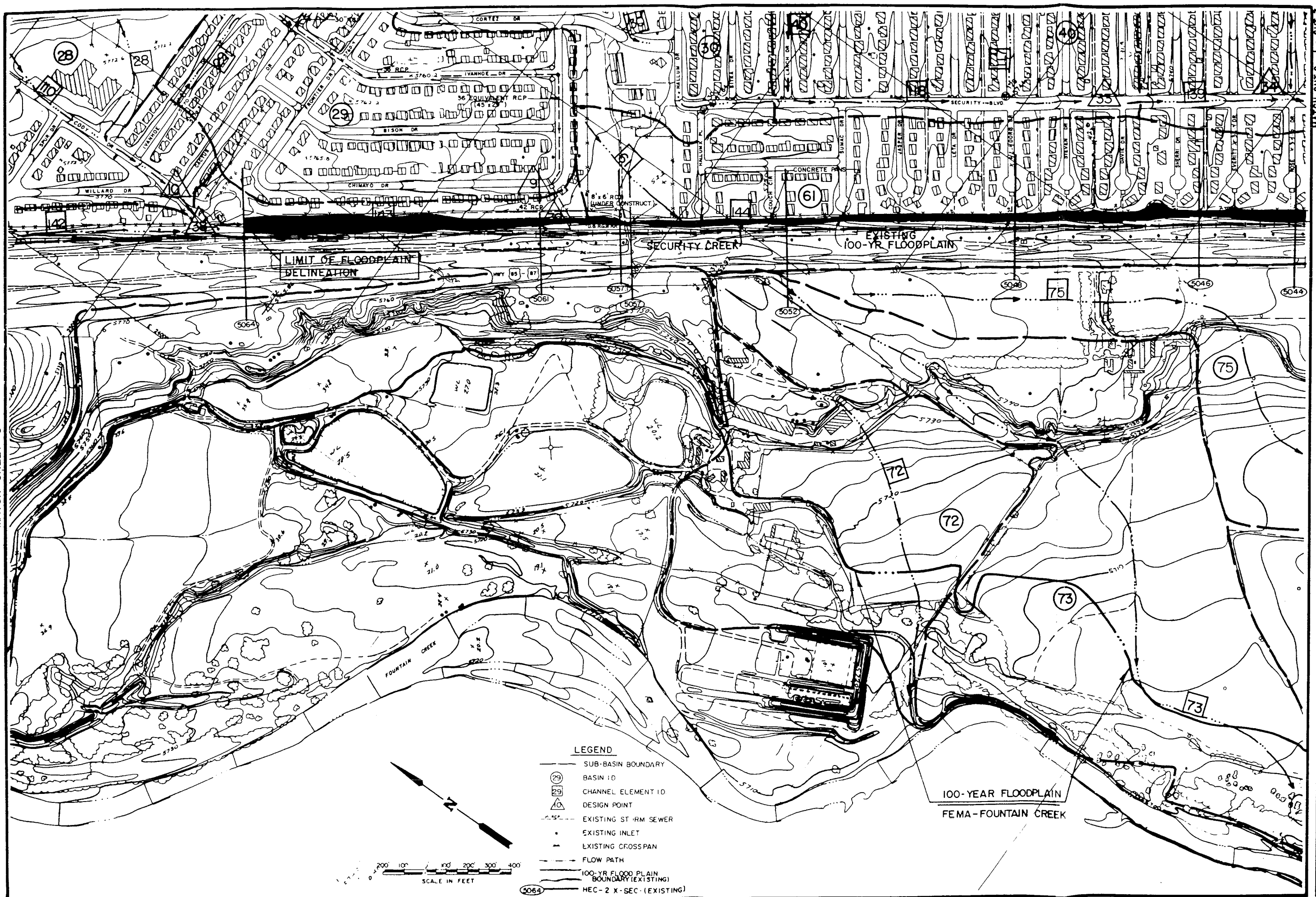
SHEET 3



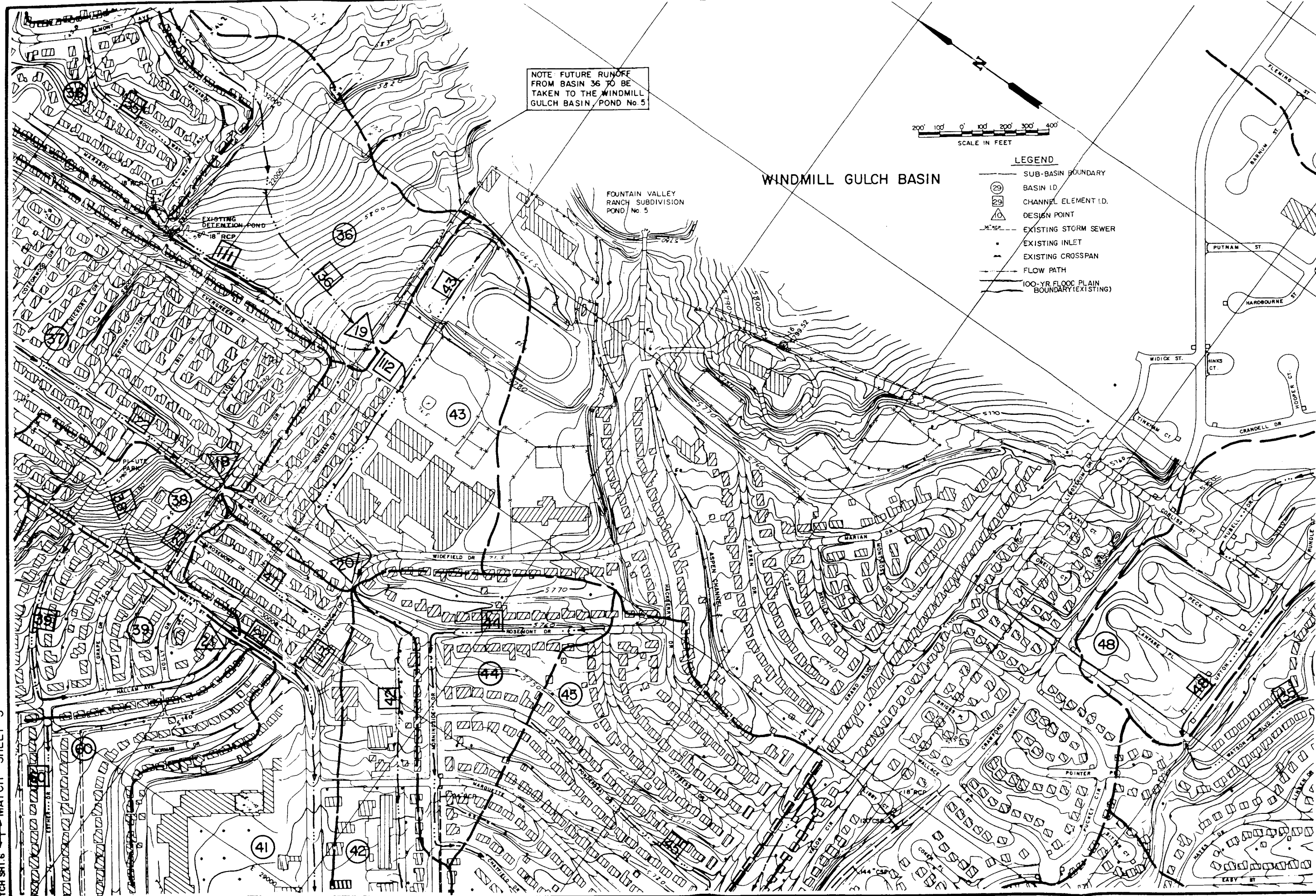
LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP

Project No.	PCU-EPG-01
Date:	10/87
Design:	JYC
Drawn:	EAK
Check:	JYC
Revisions:	

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419 West Bijou, Colorado Springs, Colorado 80905



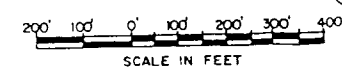
MATCH SHT. 6 ← MATCH SHEET 5



NOTE FUTURE RUNOFF
FROM BASIN 36 TO BE
TAKEN TO THE WINDMILL
GULCH BASIN / POND No. 5

FOUNTAIN VALLEY
RANCH SUBDIVISION
POND No. 5

WINDMILL GULCH BASIN

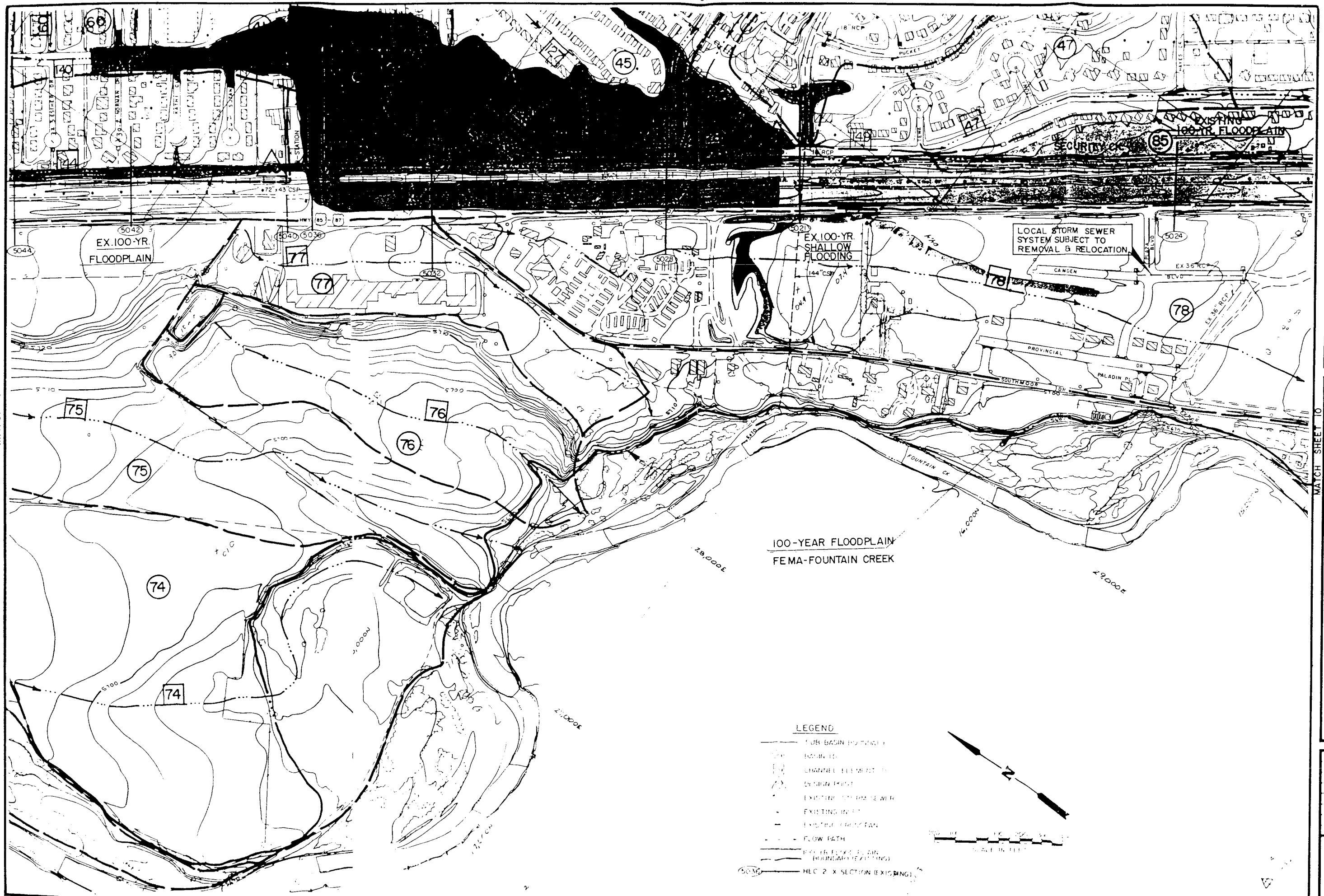


- LEGEND**
- SUB-BASIN BOUNDARY
 - BASIN I.D.
 - CHANNEL ELEMENT I.D.
 - DESIGN POINT
 - EXISTING STORM SEWER
 - EXISTING INLET
 - EXISTING CROSSSPAN
 - FLOW PATH
 - 100-YR. FLOOD PLAIN BOUNDARY (EXISTING)

LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP

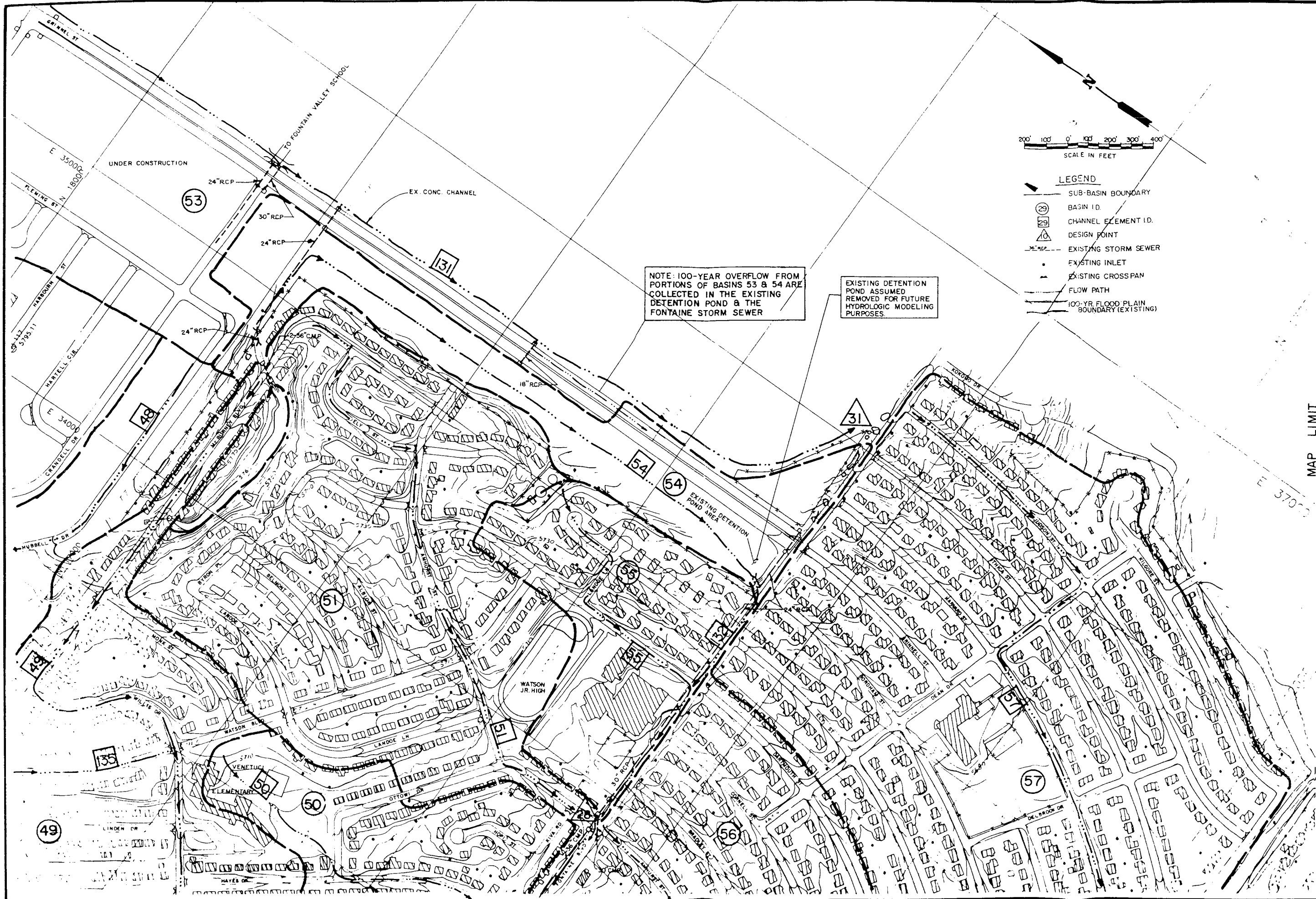
Project No.	PCO-EPC 01
Date:	10/87
Design:	JYC
Drawn:	EAK
Check:	JYC
Revisions:	

SHEET 7



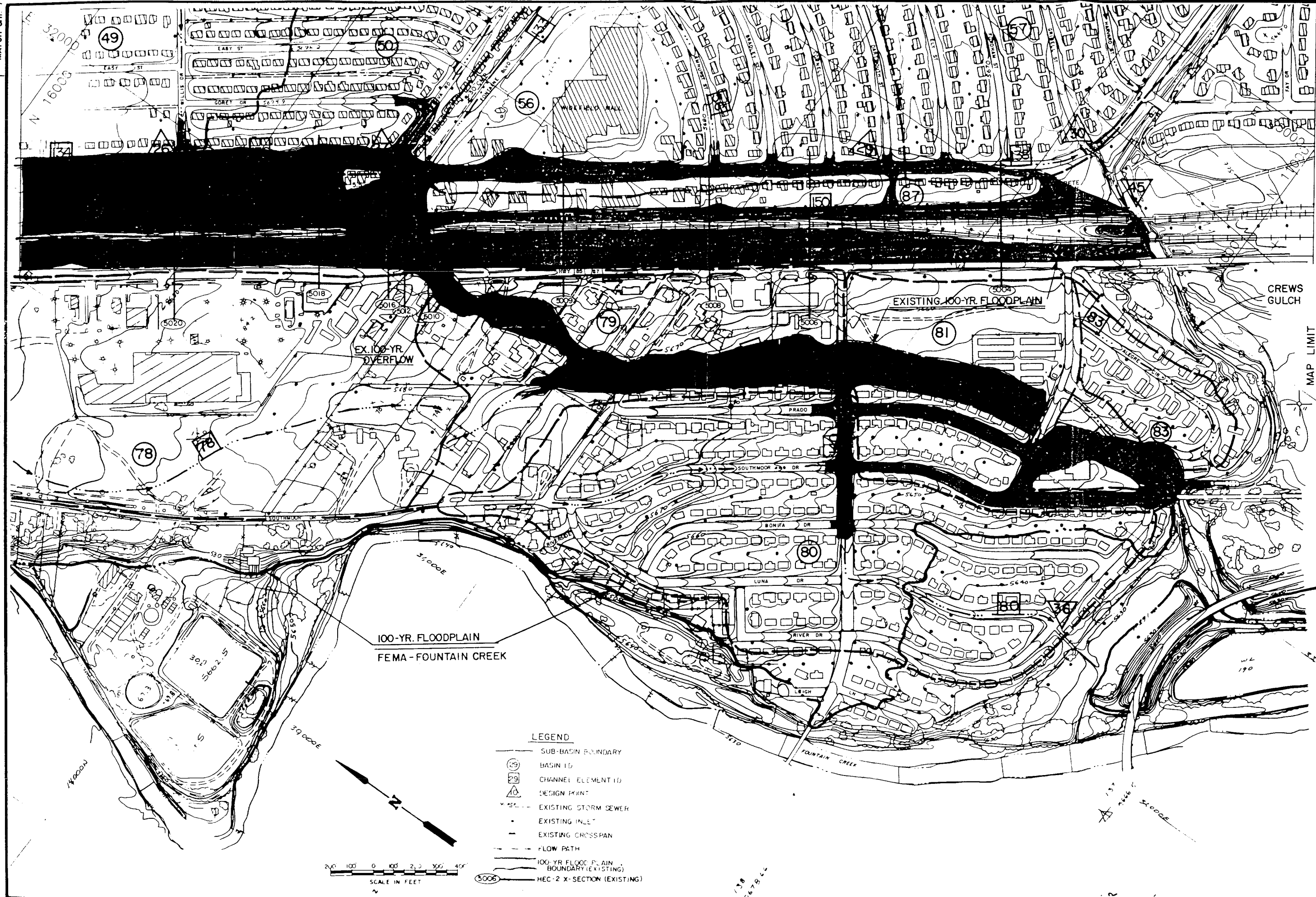
LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP

Project No.	100-100
Date	10/1/00
Design	SLA
Drawn	SLA
Check	SLA
Revisions	



LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
HYDROLOGIC & FLOODPLAIN INFORMATION &
EXISTING FACILITIES MAP

Project No. PCO-EPC-01
Date: 10/87
Design: JYC
Drawn: EAK
Check: RNW
Revisions:



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LITTLE JOHNSON/SECURITY CREEK

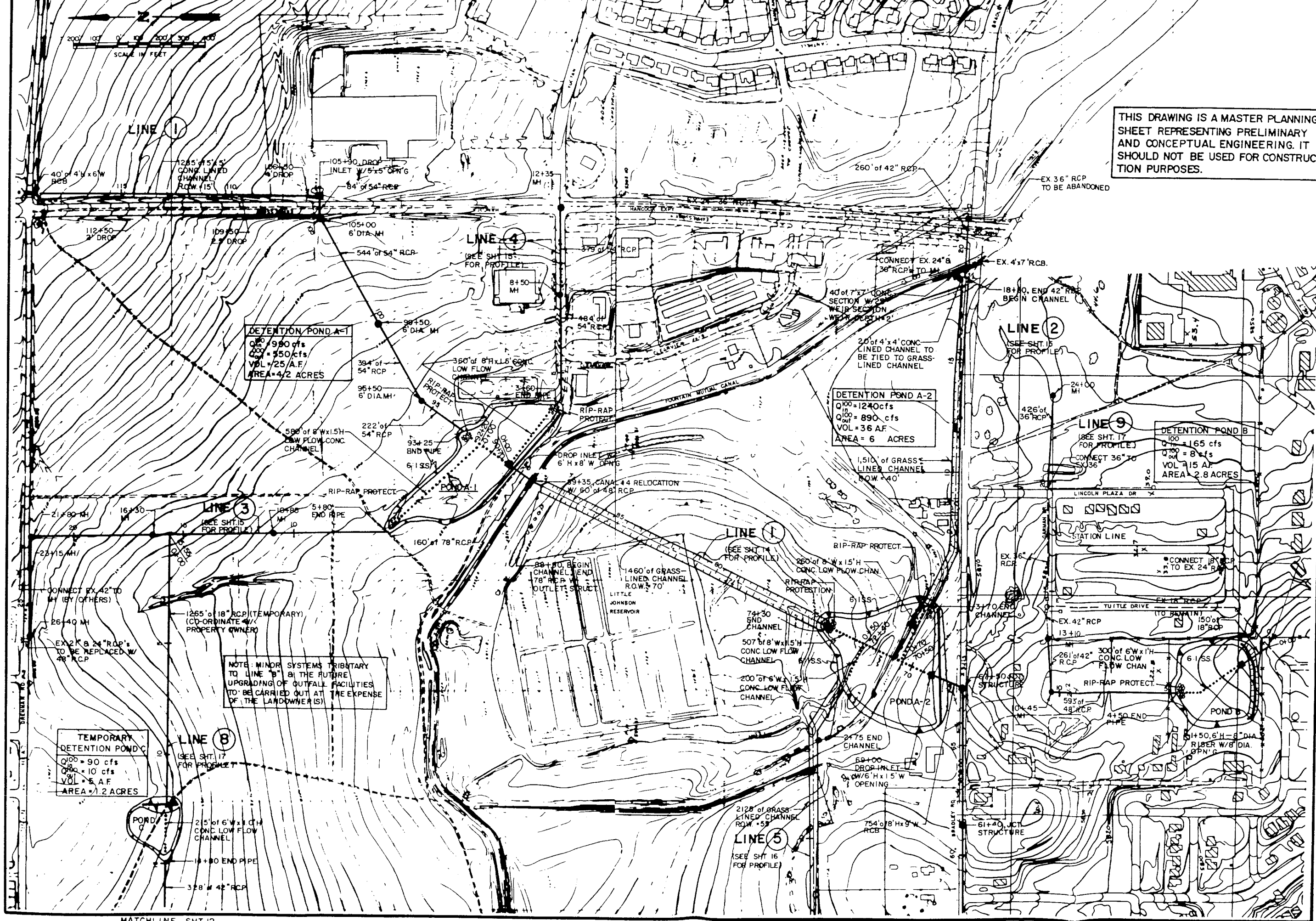
DRAINAGE BASIN PLANNING STUDY

PRELIMINARY DESIGN

HYDROLOGIC & FLOODPLAIN INFORMATION & EXISTING FACILITIES MAP

Project No. PCO-EPC-G1
Date: 10/87
Design: RNW/JYC
Drawn: EAK
Check: JYC
Revisions:

SHEET 10



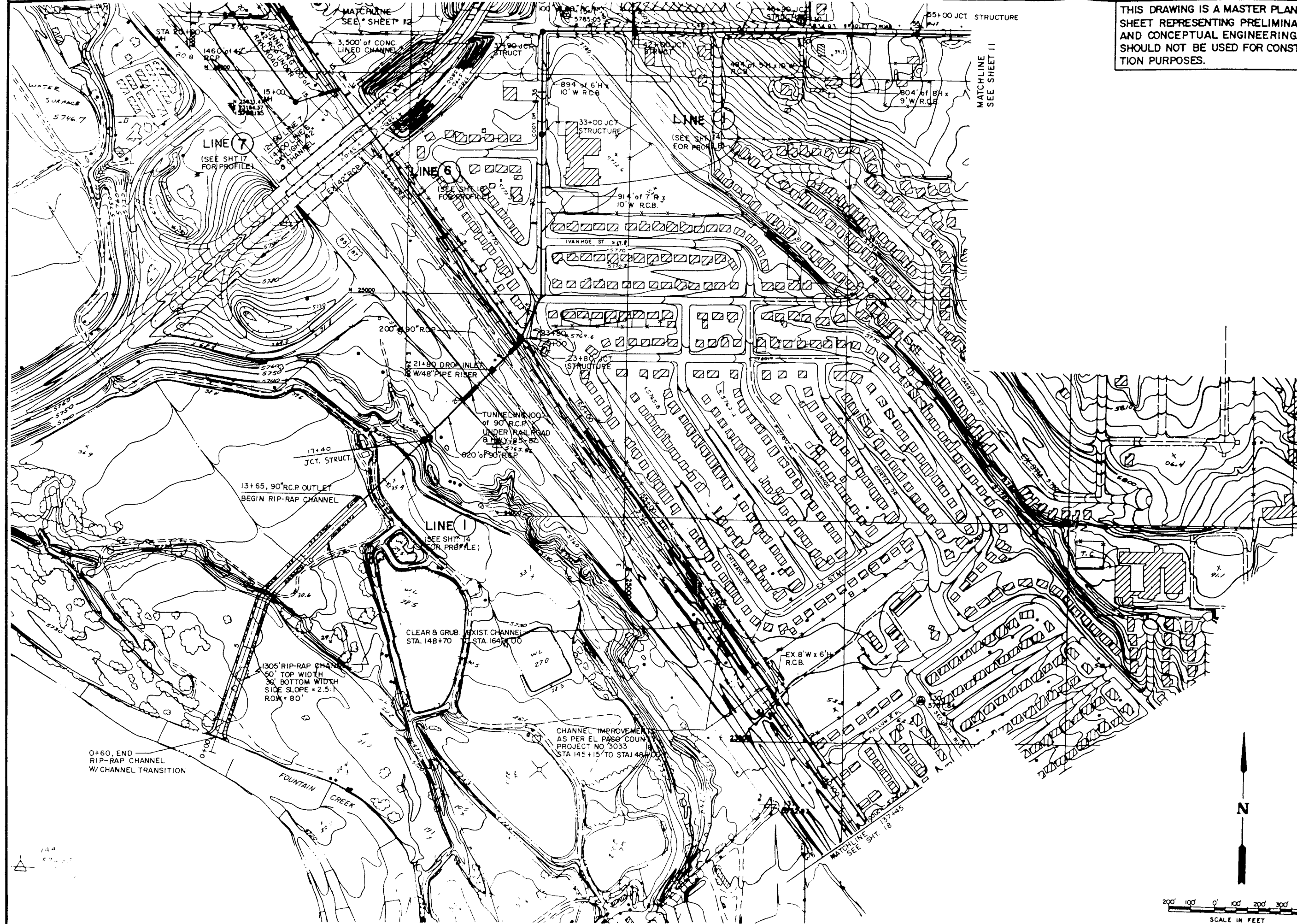
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LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN - REGIONAL DETENTION POND SYSTEM

Project No	PCO-EPC-01
Date:	10/87
Design:	JYC
Drawn:	EAK
Check:	JYC
Revisions:	



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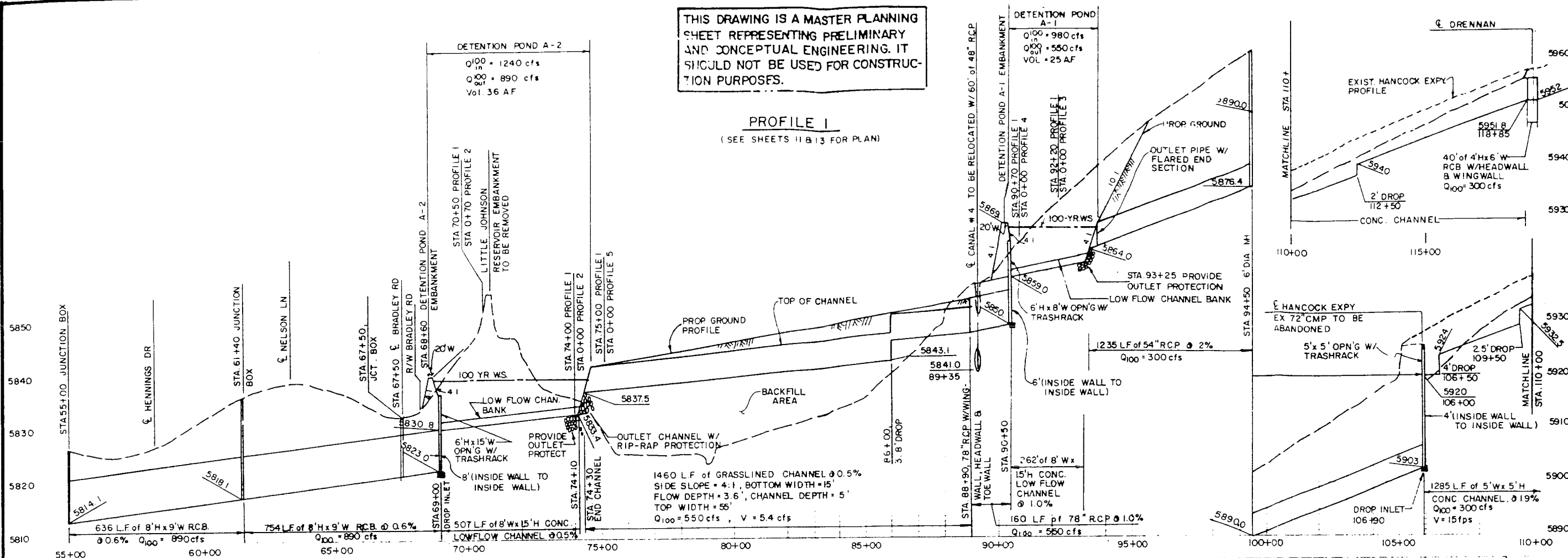
LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN - REGIONAL DETENTION POND SYSTEM

Project No. PCO-EPC-01
Date: 10/87
Design: JYC
Drawn: EAK
Check: JYC
Revisions:

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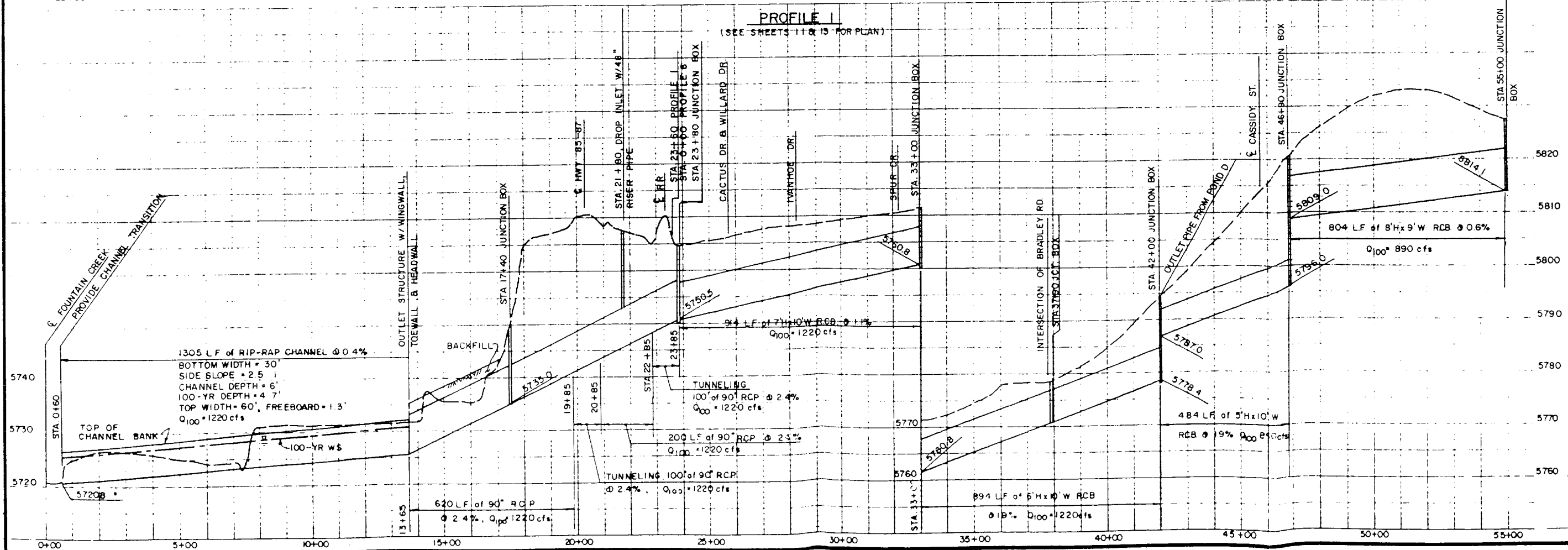
PROFILE 1

(SEE SHEETS 11 & 13 FOR PLAN)



PROFILE 1

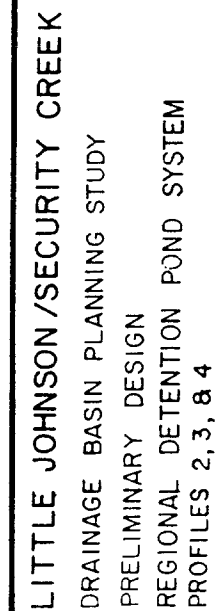
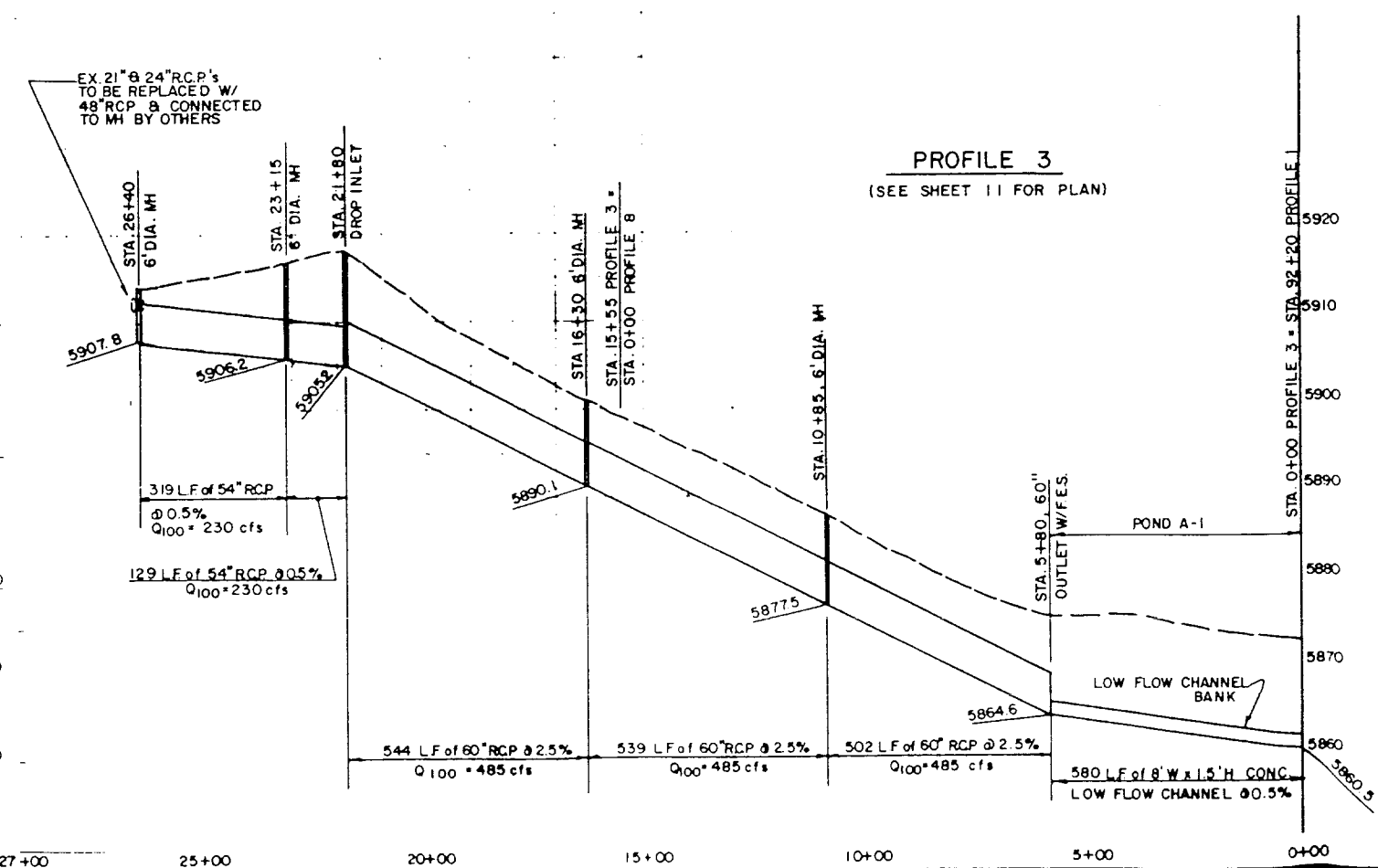
(SEE SHEETS 11 & 13 FOR PLAN)



LITTLE JOHNSON/SECURITY CREEK
 DRAINAGE BASIN PLANNING STUDY
 PRELIMINARY DESIGN
 REGIONAL DETENTION POND SYSTEM
 PROFILE 1

Project No. PCO-EPC-01
 Date: 10/87
 Design: JYC
 Drawn: EAK
 Check: JYC
 Revisions:

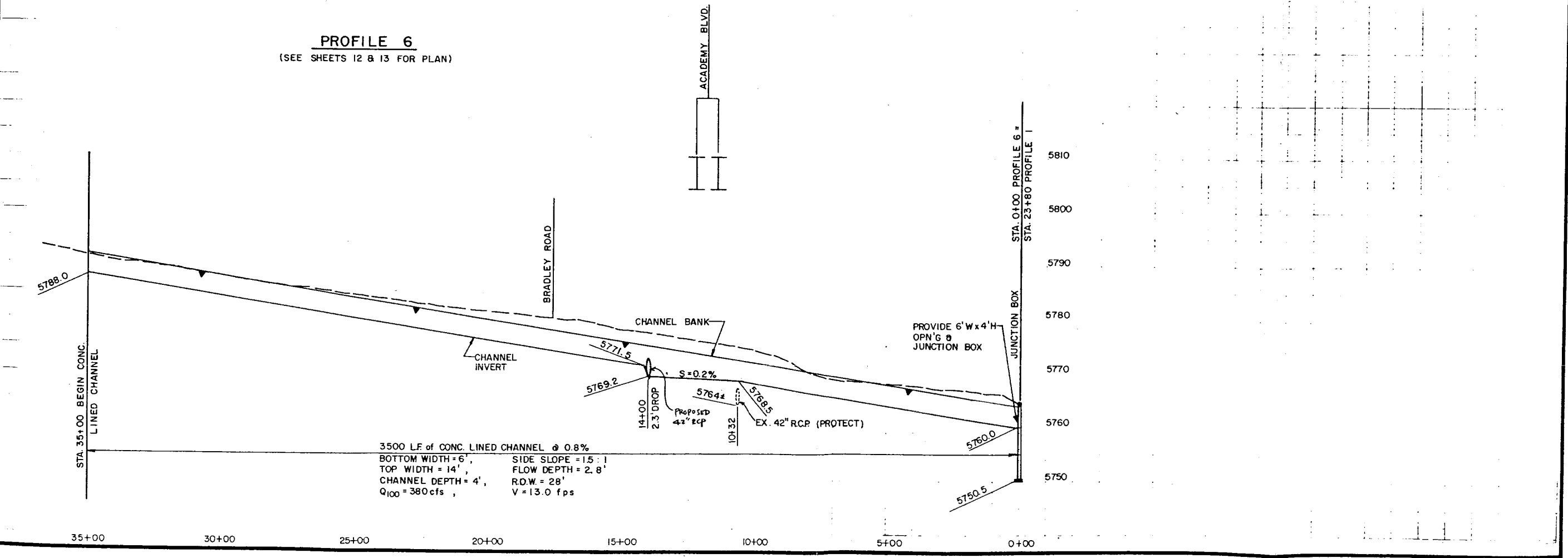
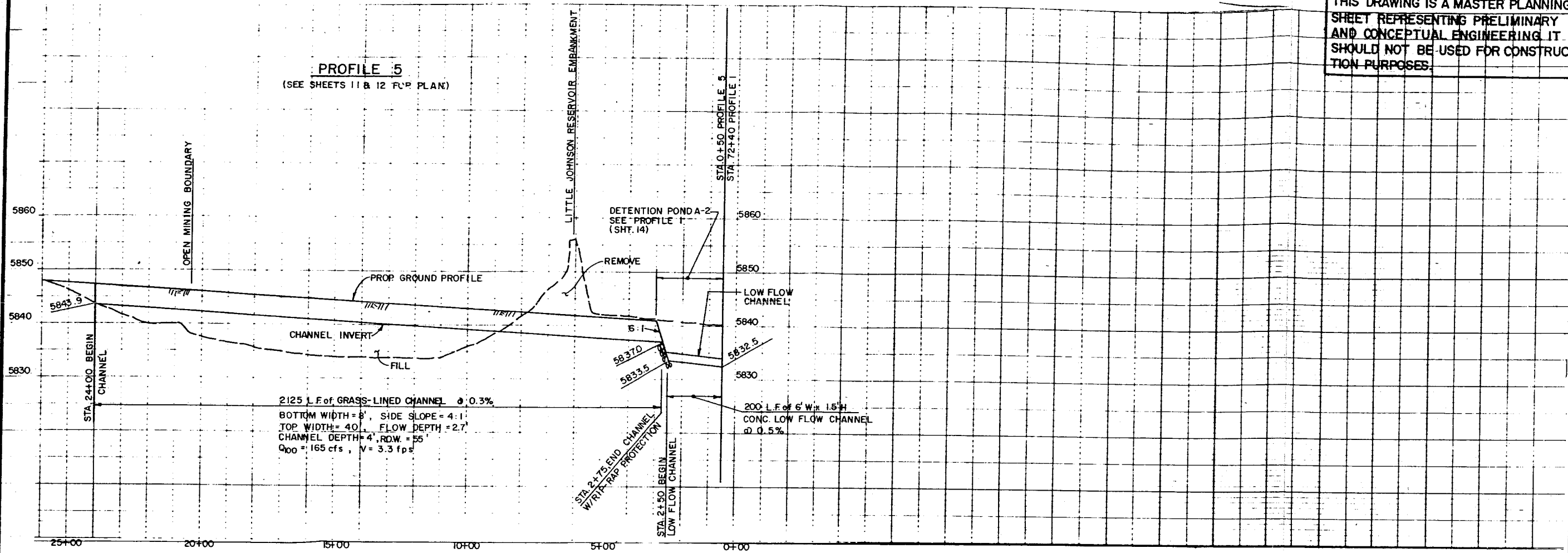
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SHEET 15

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LITTLE JOHNSON/SECURITY CREEK
 DRAINAGE BASIN PLANNING STUDY
 PRELIMINARY DESIGN
 REGIONAL DETENTION POND SYSTEM
 PROFILES 5 & 6

Project No	PCO-EPC-01
Date:	10/87
Design:	JYC
Drawn:	EAK
Check:	JYC
Revisions:	

SHEET 16

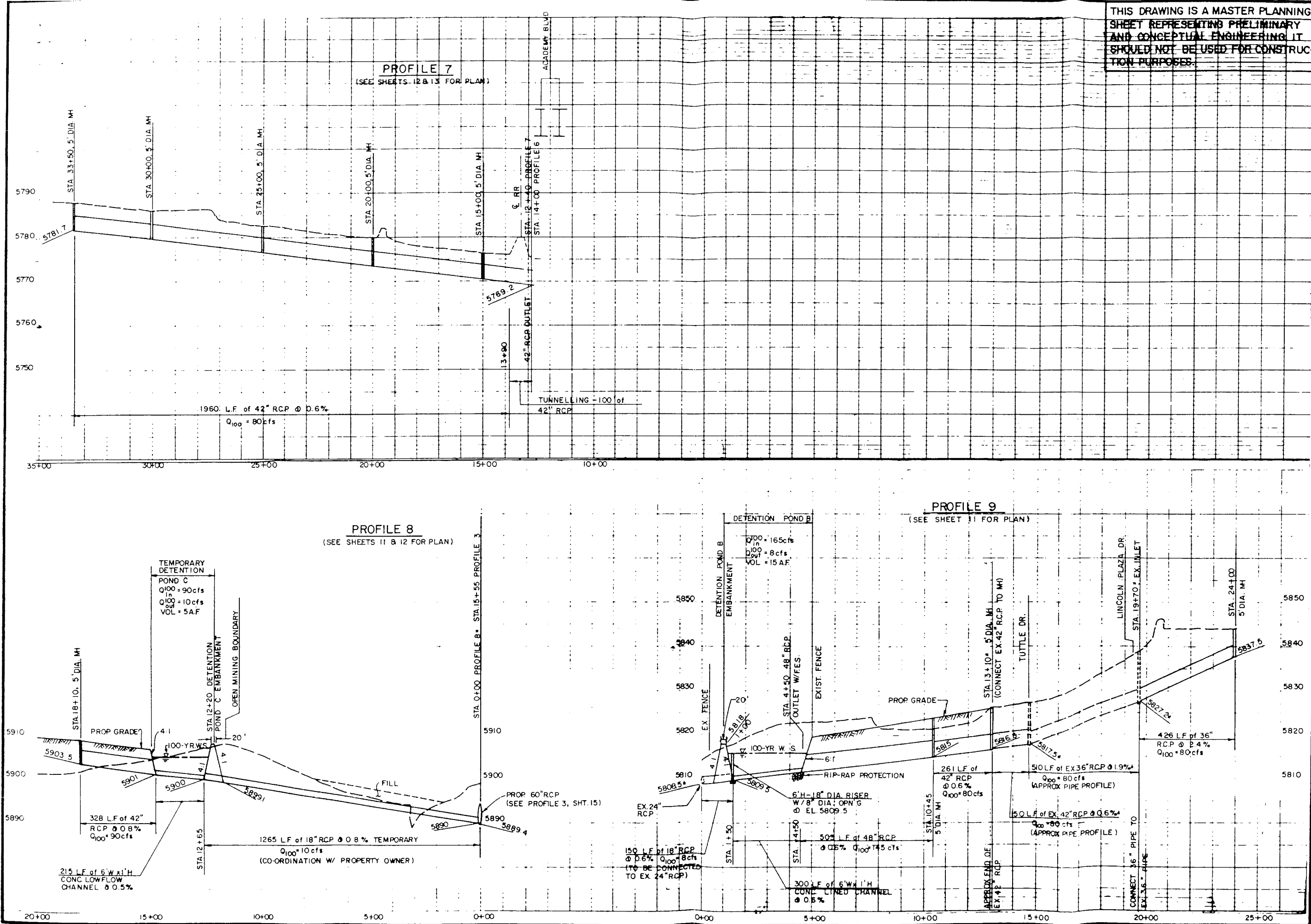
SHEET REPRESENTING PRELIMINARY
AND CONCEPTUAL ENGINEERING. IT
SHOULD NOT BE USED FOR CONSTRUCTION
PURPOSES.

SLA
SIMONS, Li & ASSOCIATES, INC.
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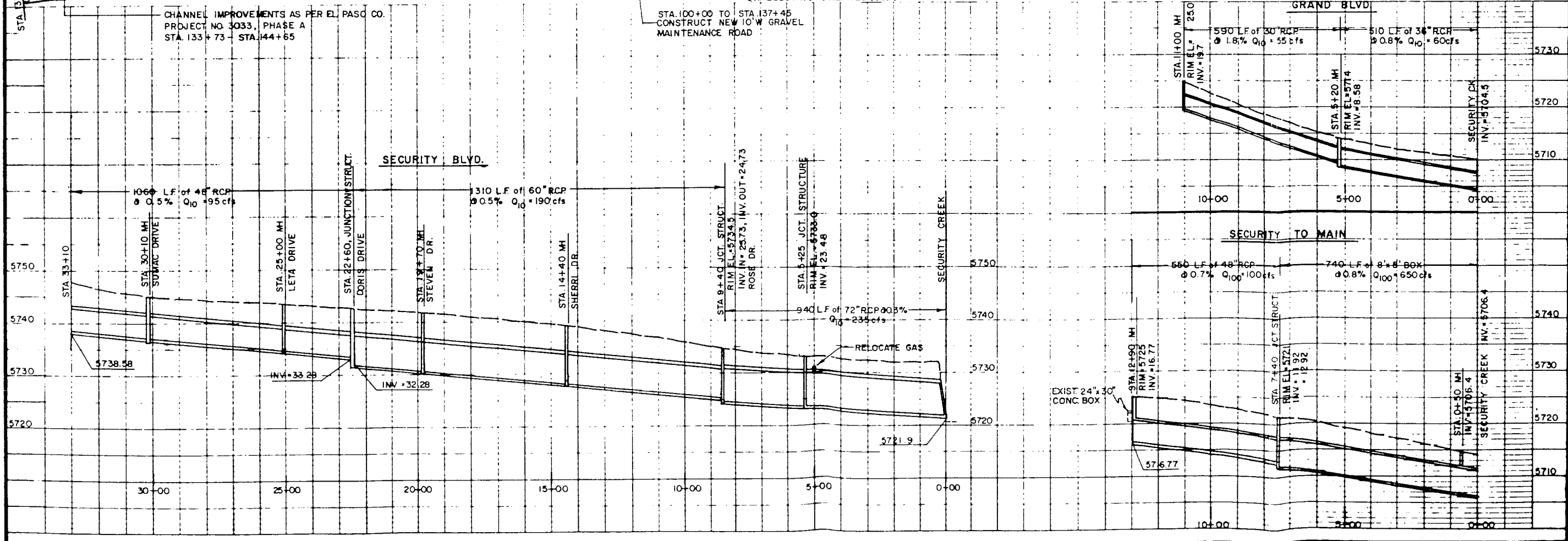
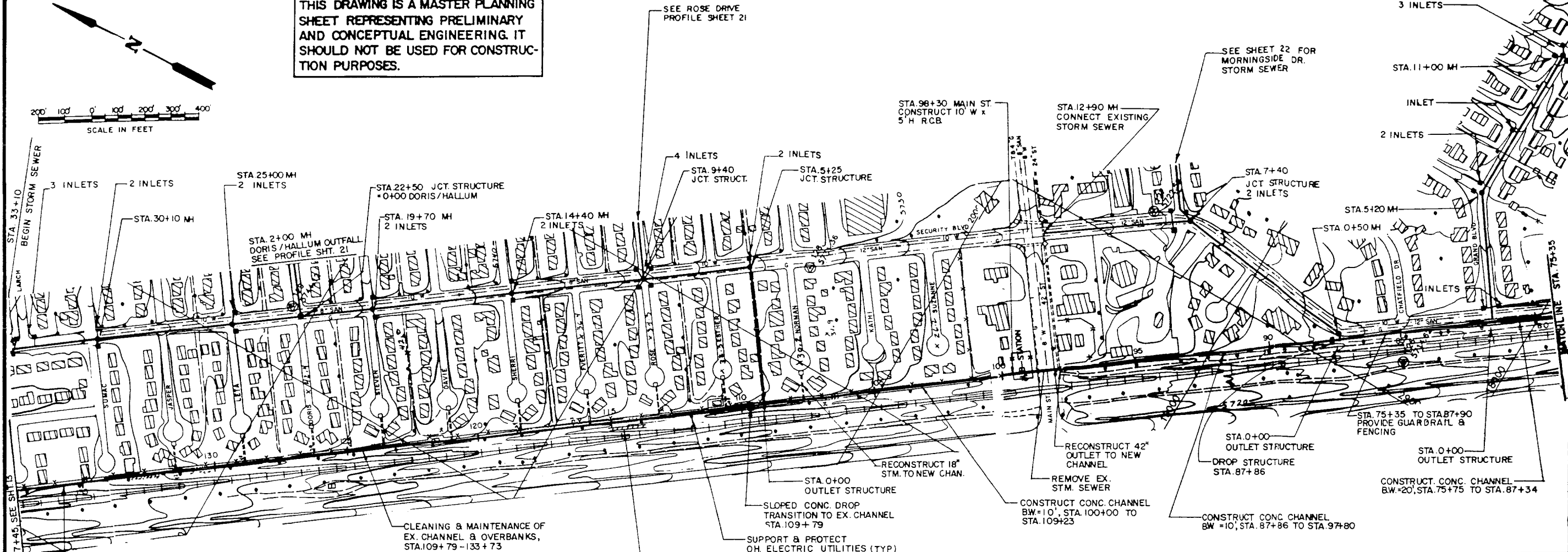
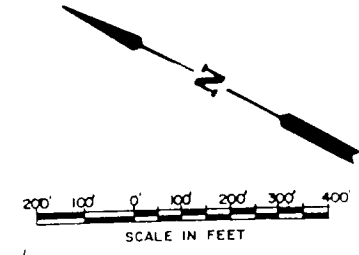
LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
REGIONAL DETENTION POND SYSTEM
PROFILES 7, 8, & 9

Project No	PCO-EPC-01
Date	10/87
Design	JYC
Drawn	EAK
Check	JYC
Revisions:	

SHEET 17



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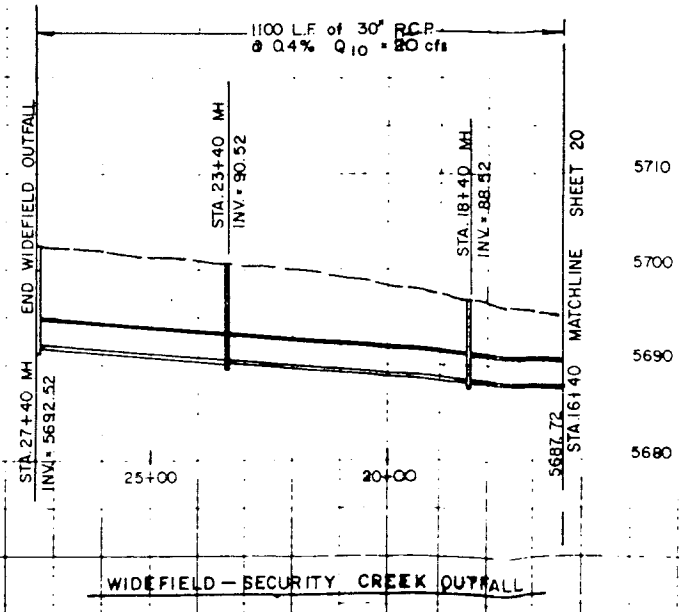
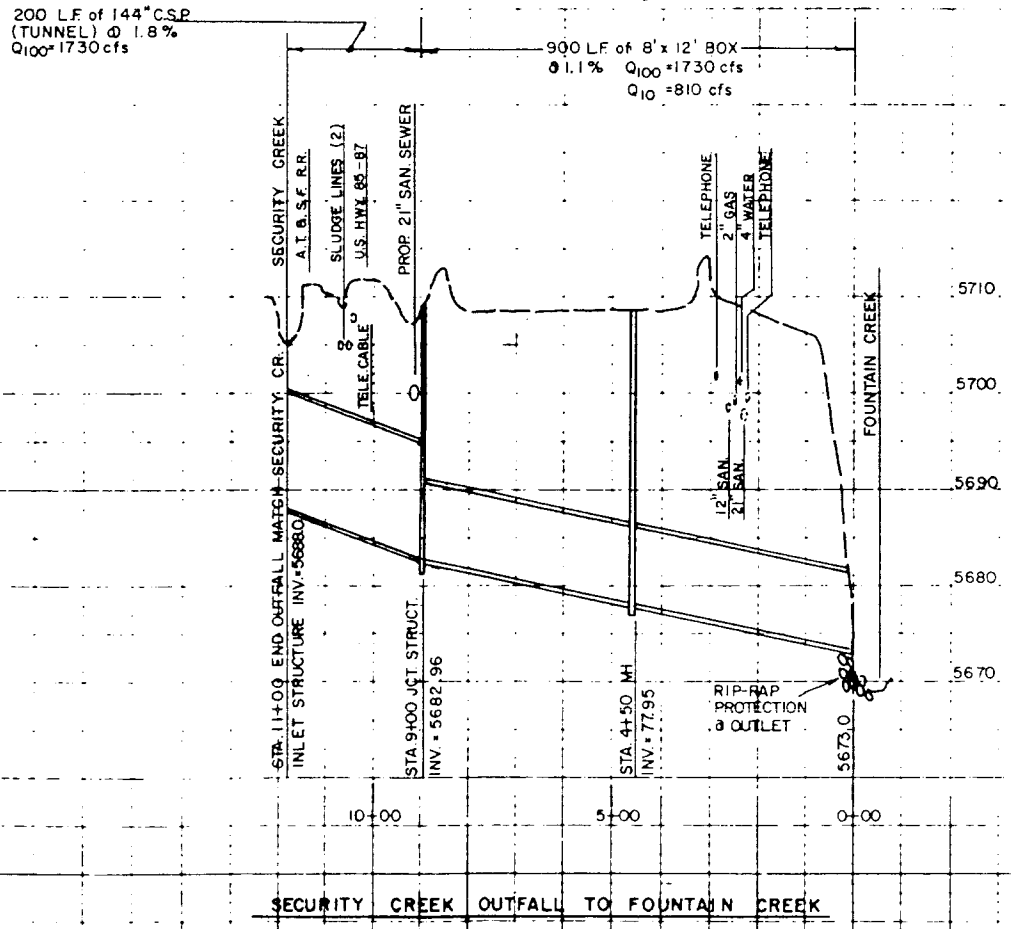
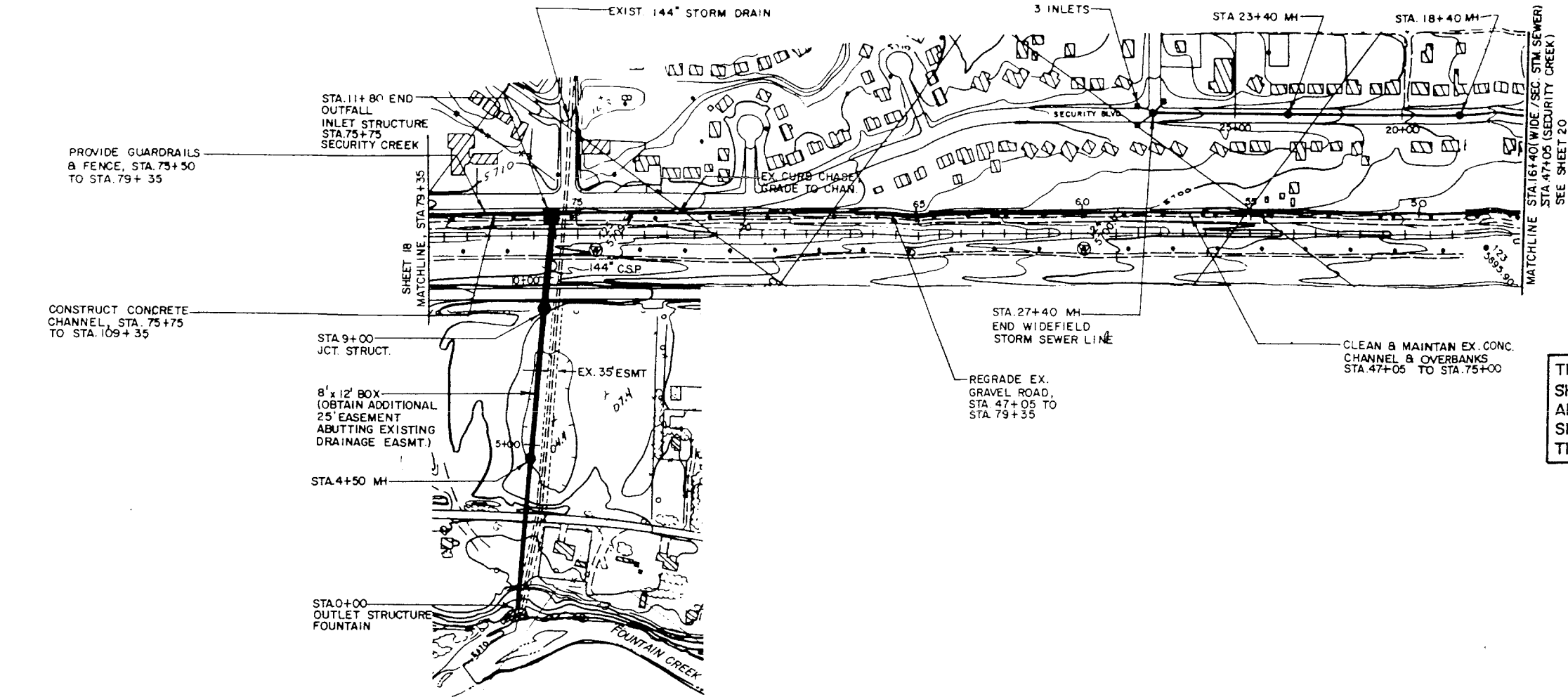


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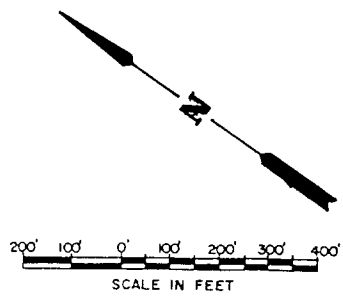
LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE: SECURITY BLVD. OUTFALL @ GRAND BLVD. OUTFALL
PLAN: SECURITY CREEK

Project No. PCO-EPC-01
Date: 10/87
Design: TCF/RNW
Drawn: EAK
Check: TCF/RNW
Revisions:

SHEET 18



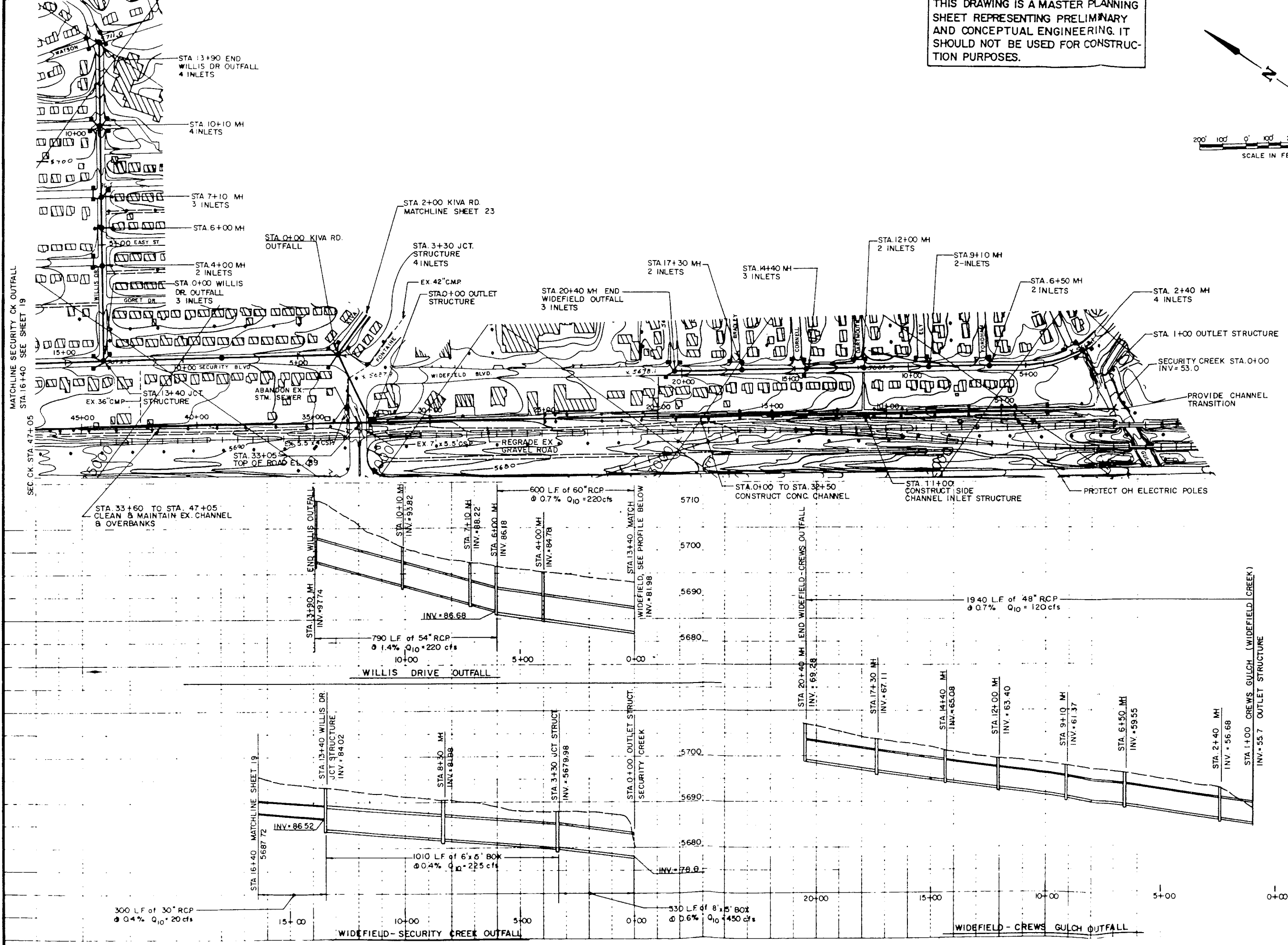
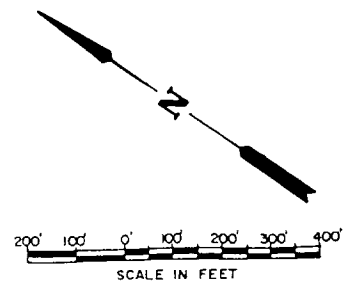
THIS DRAWING IS A MASTER PLANNING SHEET REPRESENTING PRELIMINARY AND CONCEPTUAL ENGINEERING. IT SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.



LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE : SECURITY CREEK OFFFALL &
WIDEFIELD - SECURITY CREEK OFFFALL

Project No.	PCO-EPC-01
Date:	10/87
Design:	TCF
Drawn:	EAK
Check:	TCF
Revisions:	

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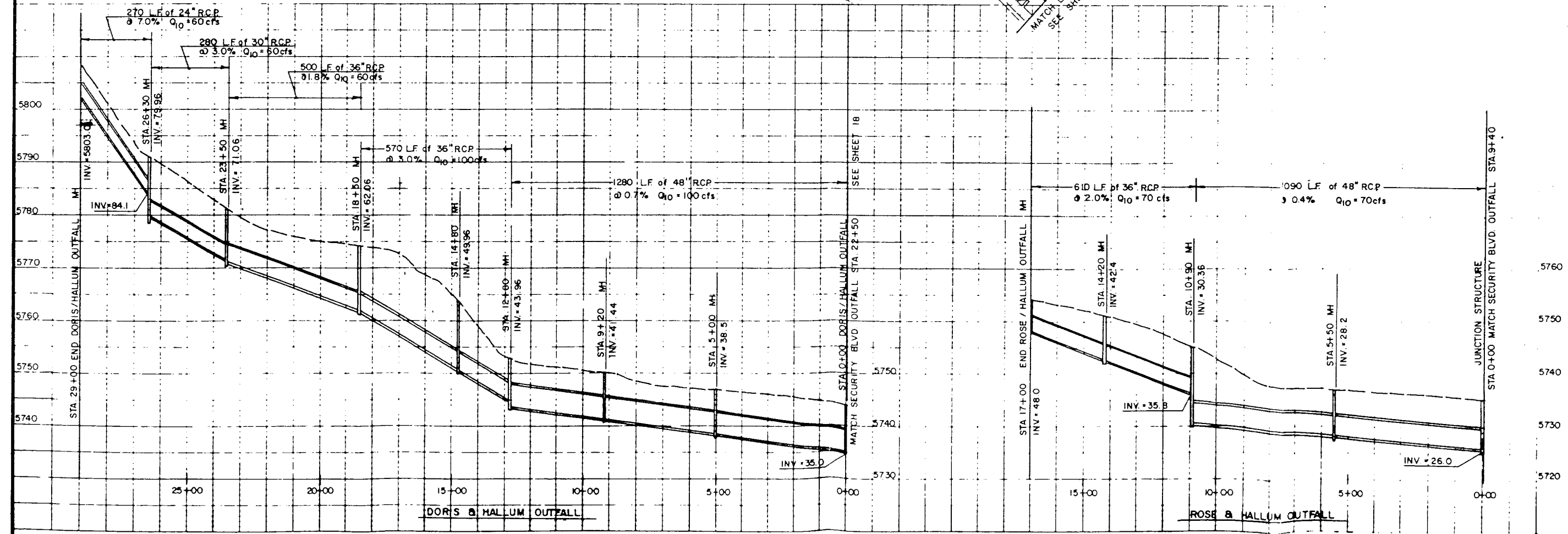
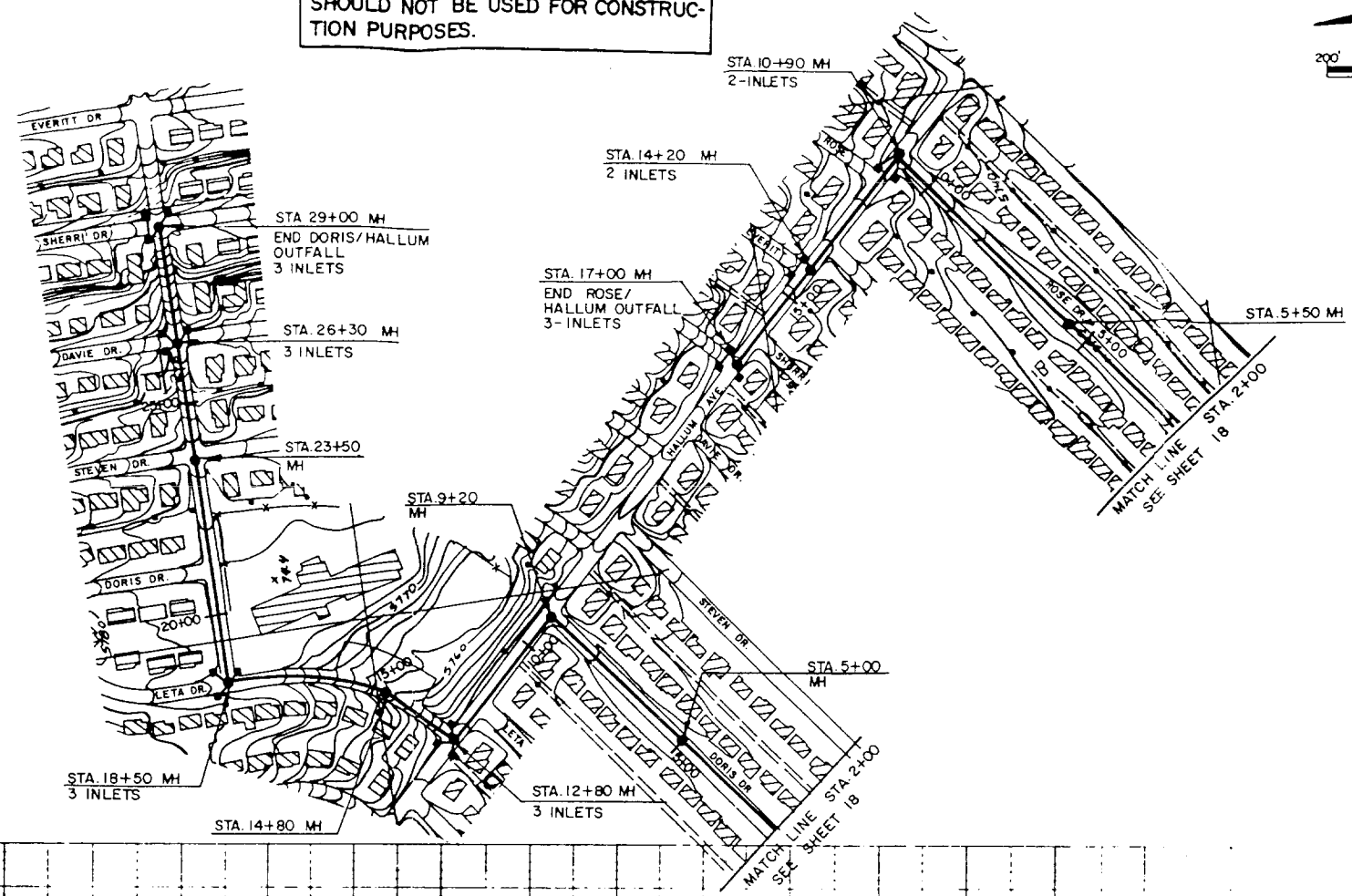
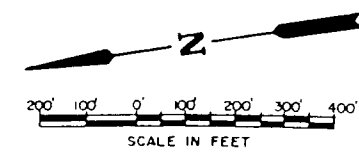


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LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE: WILLIS DRIVE OUTFALL, WIDEFIELD-SECURITY CREEK OUTFALL, & WIDEFIELD-CREWS GULCH OUTFALL
PLAN: SECURITY CREEK

Project No.	PCO-EPC-01
Date:	10/87
Design:	TCF/RNW
Drawn:	EAK
Check:	TCF/RNW
Revisions:	

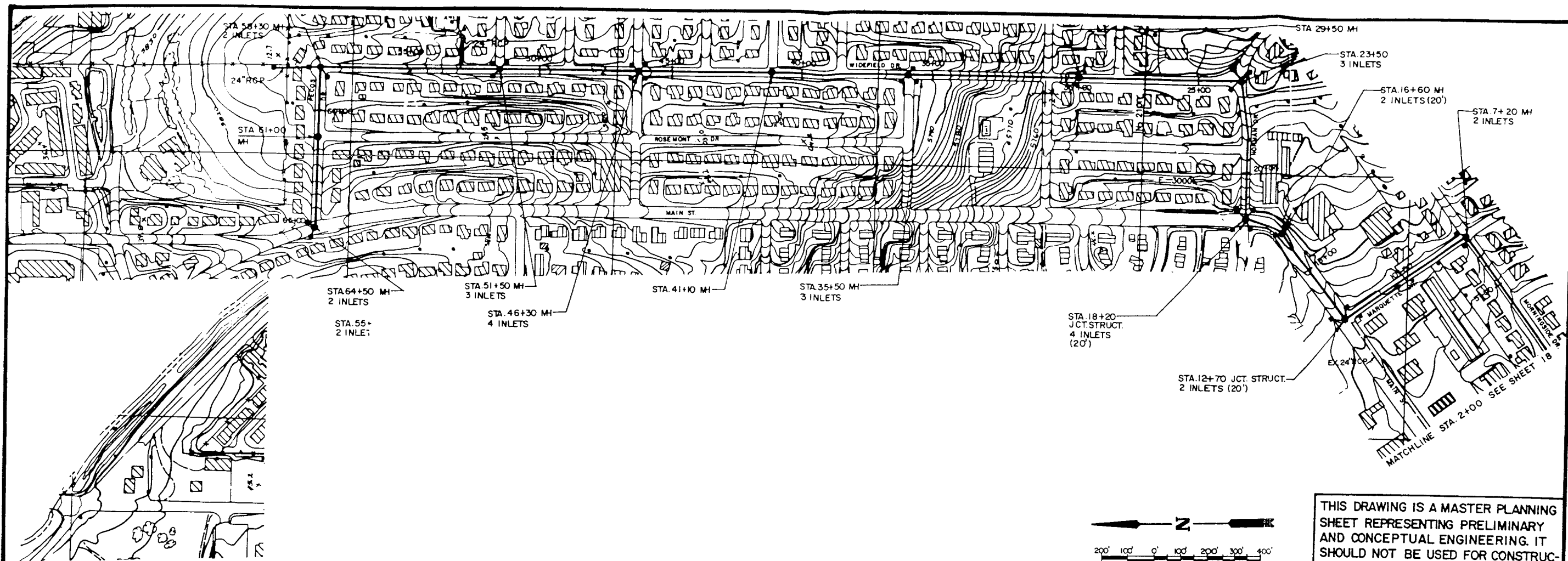
THIS DRAWING IS A MASTER PLANNING SHEET REPRESENTING PRELIMINARY AND CONCEPTUAL ENGINEERING. IT SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.



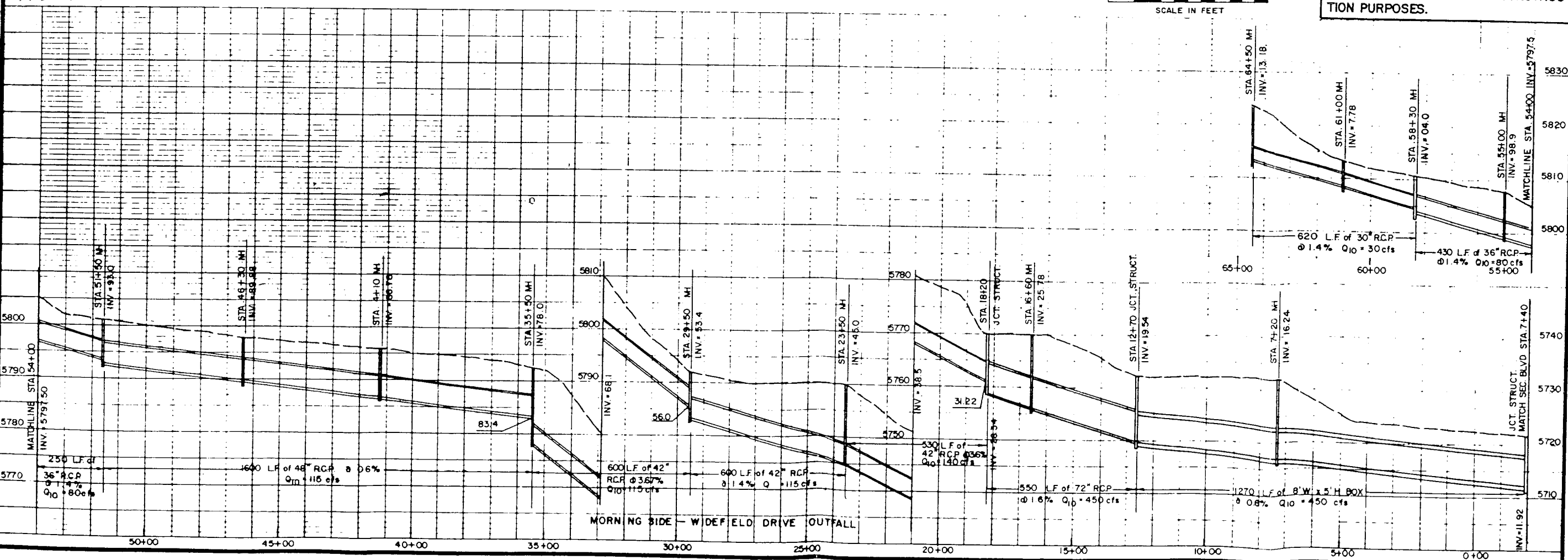
LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE: DORIS & HALLUM OUTFALL
ROSE & HALLUM OUTFALL

Project No.	PCO-EPC-01
Date:	10/87
Designer:	TCF
Drawn:	EAK
Checked:	TCF
Revisions:	

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419 West Bijou, Colorado Springs, Colorado 80903 Phone 303-442-7742

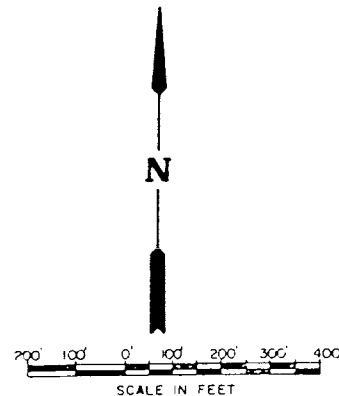


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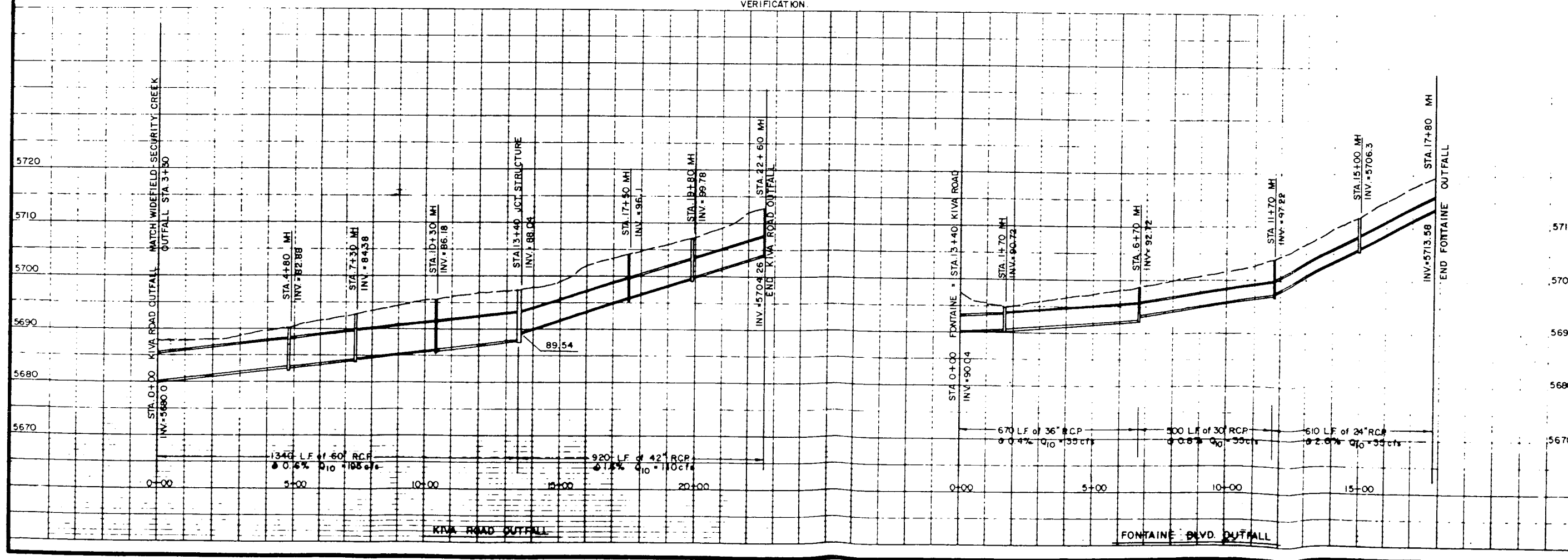
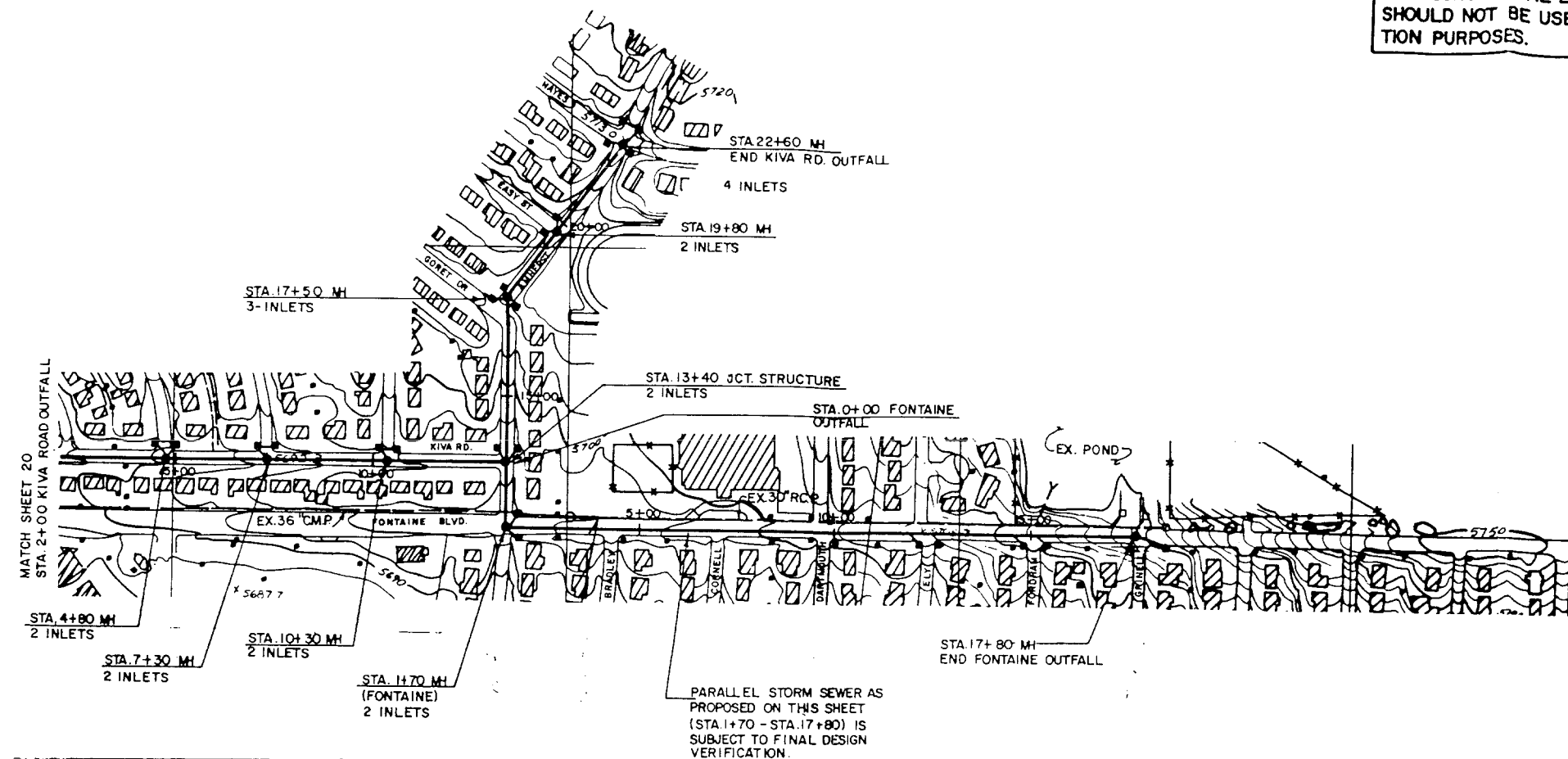


LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE: MORNINGSIDE - WIDEFIELD
DRIVE OUTFALL

Project No.	PCOEPC-01
Date:	10/87
Design:	TCF
Drawn:	EAK
Check:	TCF
Revisions:	

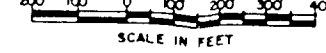


THIS DRAWING IS A MASTER PLANNING SHEET REPRESENTING PRELIMINARY AND CONCEPTUAL ENGINEERING. IT SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

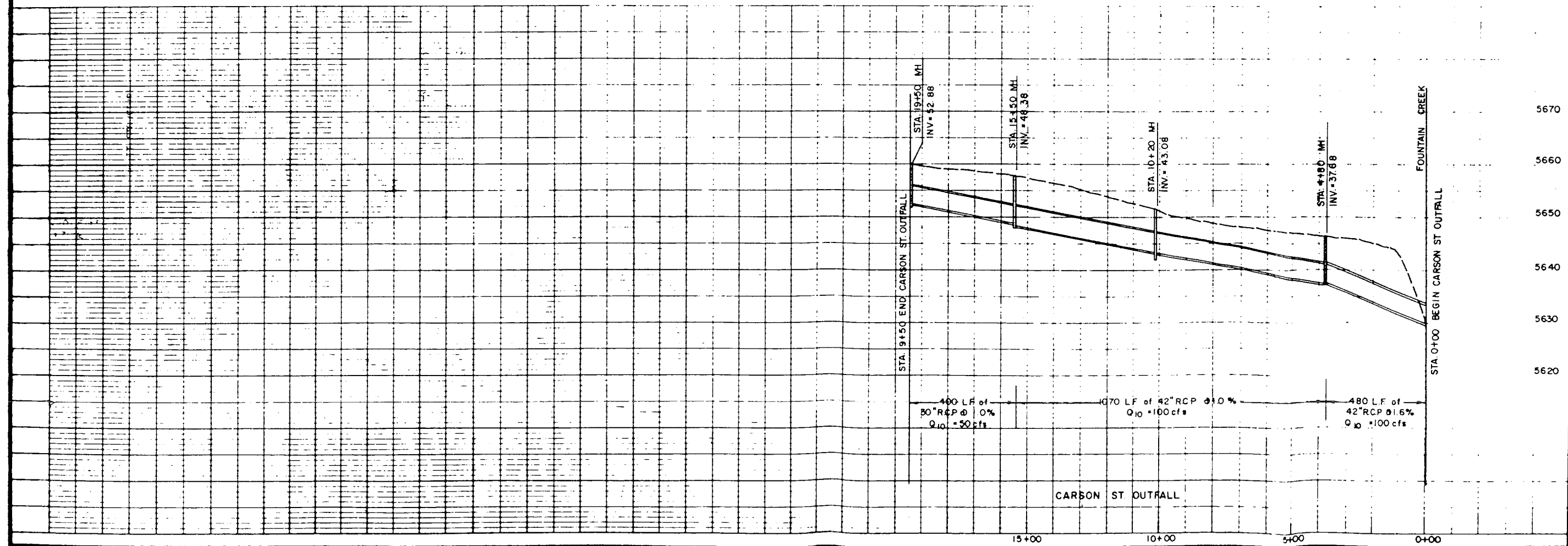
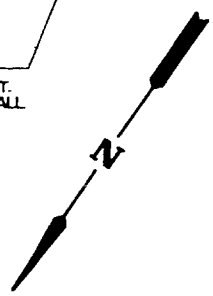
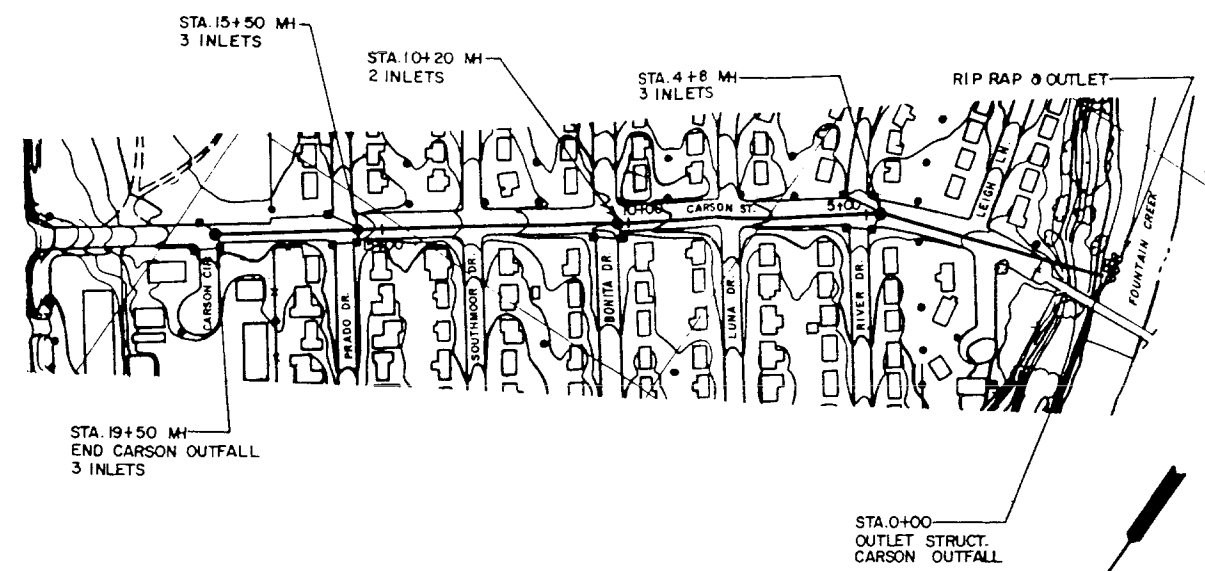
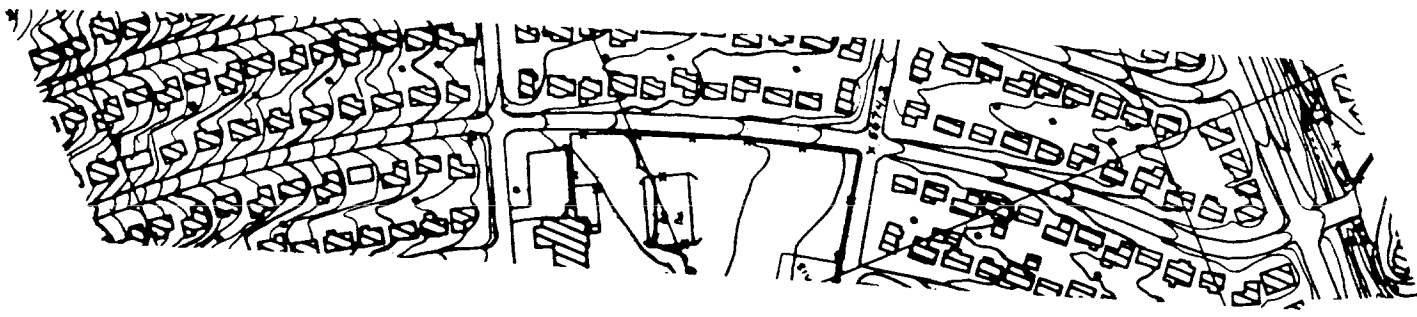


LITTLE JOHNSON / SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE - KIVA ROAD OUTFALL & FONTAINE BLVD OUTFALL

Project No. PCO-EPC-01
Date: 10/87
Design: TCF
Drawn: EAK
Check: TCF
Revisions:



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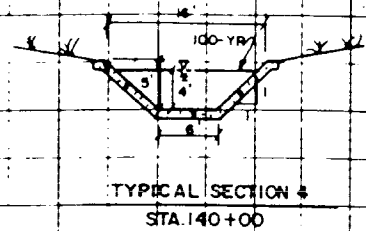


LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PLAN & PROFILE : HARVARD STREET OUTFALL &
CARSON STREET OUTFALL

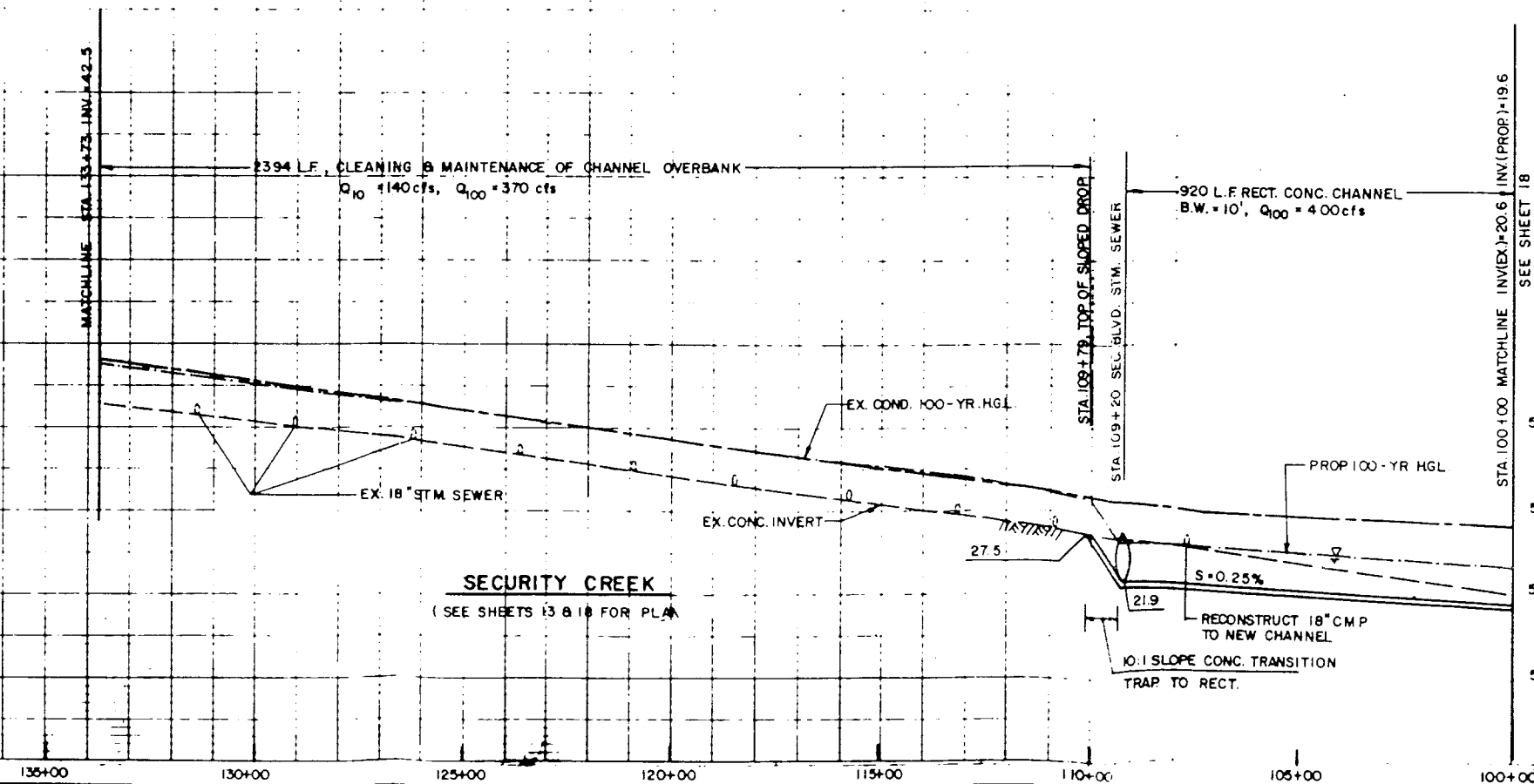
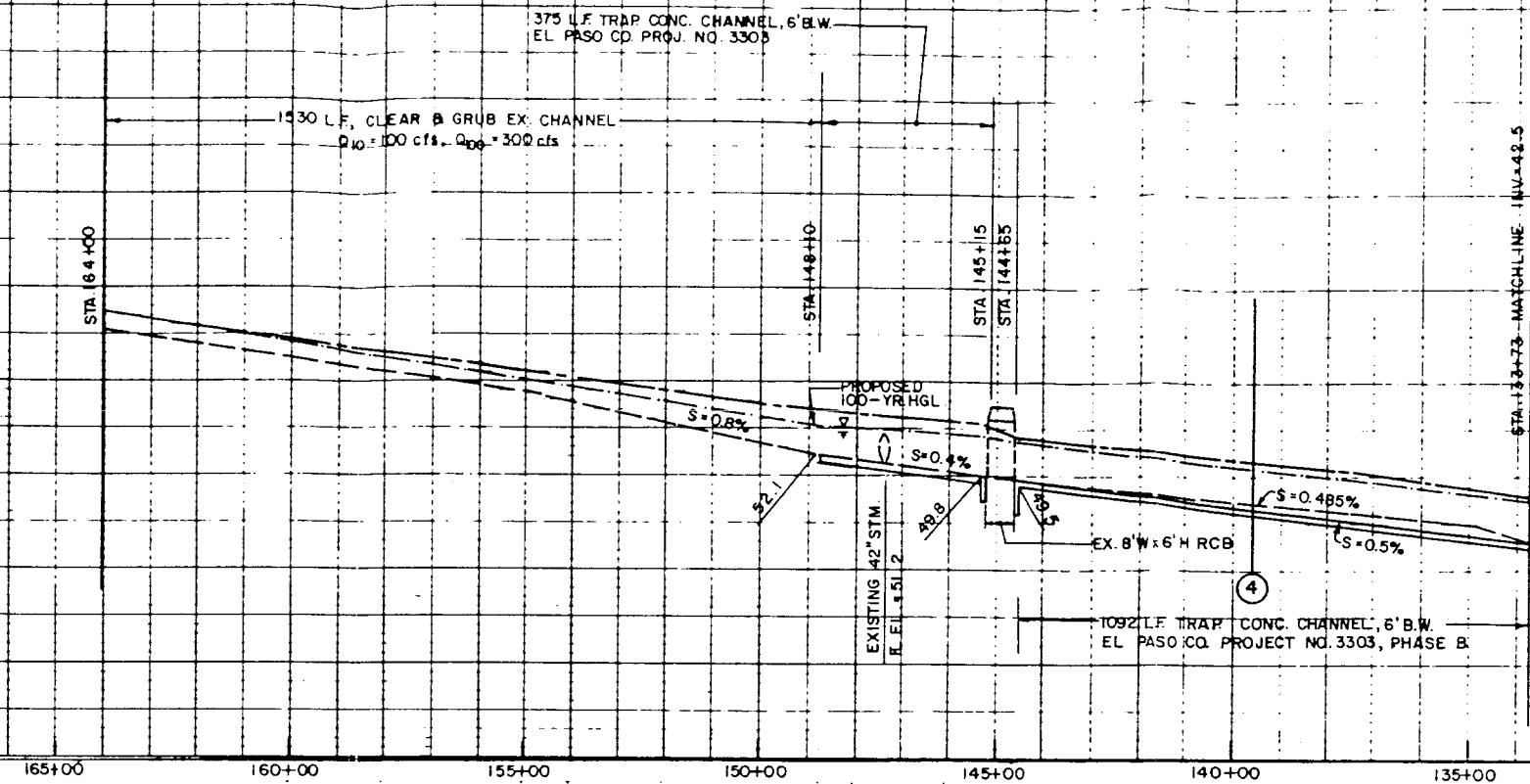
Project No.	PCO-EPC-01
Date:	10/87
Design:	TCF
Drawn:	EAK
Check:	TCF
Revisions:	



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419 West 8th Ave., Colorado Springs, Colorado 80905 Phone 719-533-7545

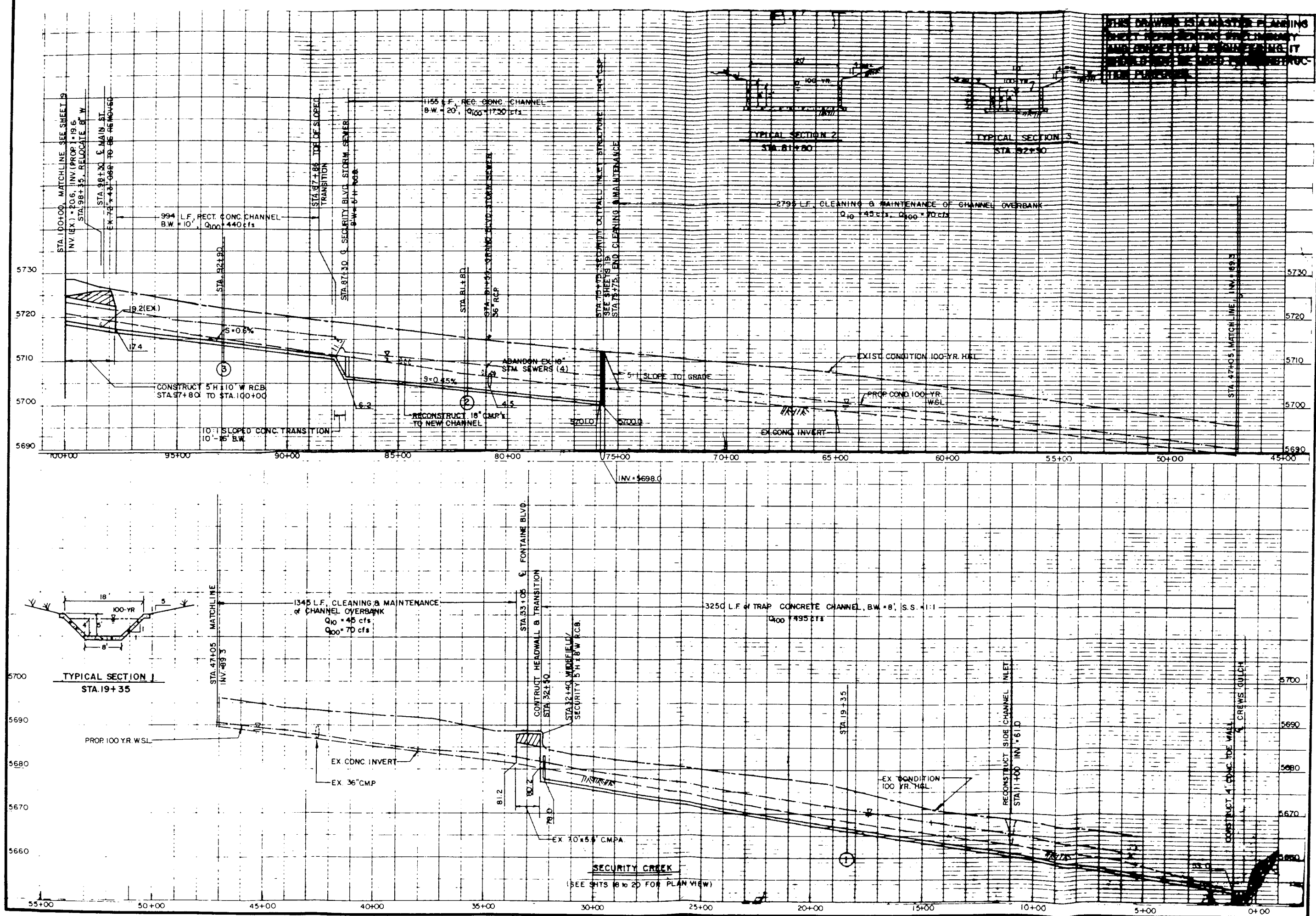


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LITTLE JOHNSON/SECURITY CREEK
DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN
PROFILE : SECURITY CREEK

Project No	PCO-EPC-01
Date	10/87
Design	RNW
Drawn	EAK
Check	RNW
Revisions	



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 SHEET REPRESENTING THE GENERAL
 CONCEPTS OF THE PROJECT. IT
 SHALL BE USED FOR PRELIMINARY
 DESIGN PURPOSES ONLY.

TYPICAL SECTION 2
 STA 81+20

TYPICAL SECTION 3
 STA 92+50

TYPICAL SECTION 1
 STA 19+35

SECURITY CREEK
 (SEE SHTS 18 TO 20 FOR PLAN VIEW)

LITTLE JOHNSON / SECURITY CREEK
 DRAINAGE BASIN PLANNING STUDY
 PRELIMINARY DESIGN
 PROFILE : SECURITY CREEK

Project No	PCO-EPG-01
Date	10/87
Design	RNW
Drawn	EAK
Check	RNW
Revisions	