



# CITY OF BOULDER

## 75TH STREET WASTEWATER TREATMENT PLANT PHASE IA

PART C DRAWINGS

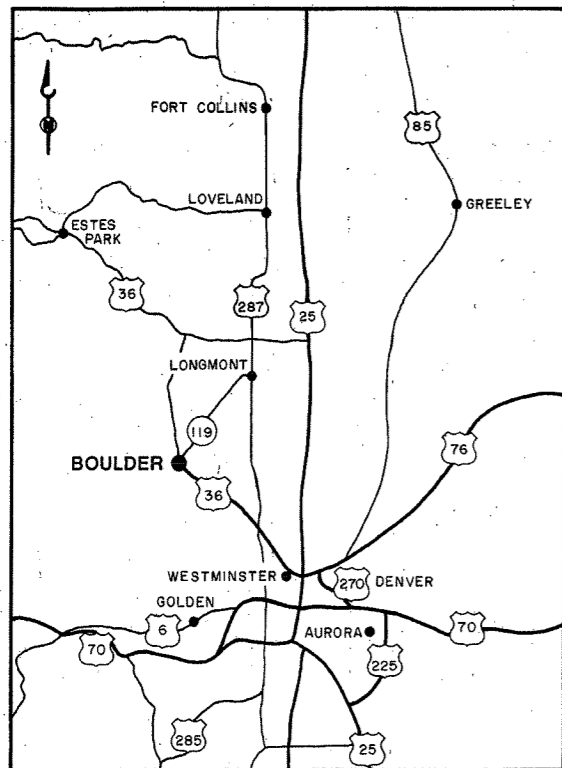
SEPTEMBER 1987

AS-BUILT DRAWINGS  
4/23/90

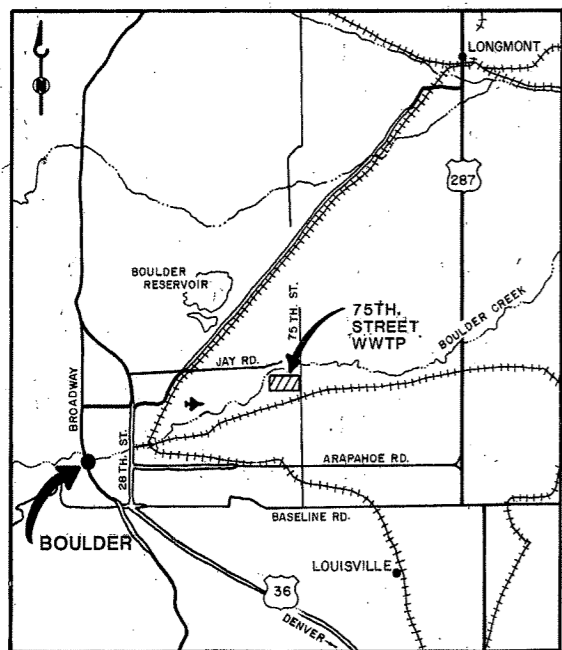


BROWN AND CALDWELL  
CONSULTING ENGINEERS

19353



VICINITY MAP



LOCATION MAP

**DRAWING NUMBERING SYSTEM**

(1) THE DRAWINGS ARE SUBDIVIDED BY GENERAL TYPE AS FOLLOWS:

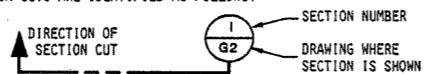
- G DESIGN DATA
- C CIVIL, OUTSIDE PIPING/SITE DEVELOPMENT
- P PROCESS SCHEMATIC
- A ARCHITECTURAL
- S STRUCTURAL
- M MECHANICAL
- E ELECTRICAL
- I INSTRUMENTATION

(2) DRAWINGS ARE NUMBERED IN ACCORDANCE WITH A PROCESS AREA CODE. THE NUMBERS ARE AS FOLLOWS:

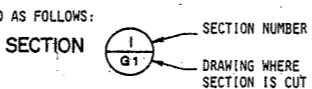
CODE	AREA
11	HEADWORKS BYPASS
12	PRIMARY PUMPING STATION
21	PRIMARY CLARIFIERS
22	PRIMARY SLUDGE PUMPING AREA
23	PST & SLUDGE PUMPING STATION
31	SECONDARY PUMPING STATION
32	TRICKLING FILTERS
41	INTERSTAGE PUMPING STATION
42	SOLIDS CONTACT TANKS
51	SECONDARY CLARIFIERS
52	GALLERY AREA
53	MCC ROOM
61	NTF PUMPING STATION
62	NTF

**CROSS REFERENCING SYSTEM**

1. SECTION CUTS ARE IDENTIFIED AS FOLLOWS:



2. SECTIONS ARE TITLED AS FOLLOWS:

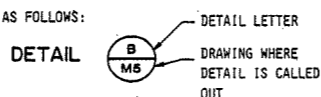


3. DETAILS ARE IDENTIFIED AS FOLLOWS:

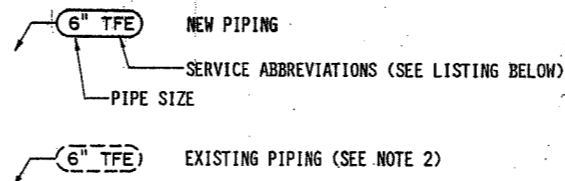
A. BY NOTE: "SEE DETAIL B/M5" -- B. IS DETAIL LETTER  
-- M5 IS DRAWING WHERE DETAIL IS SHOWN

B. BY CIRCLING AREA TO BE DETAILED AND LEADING OUT TO AN ENLARGED DETAIL OF THE CIRCLED AREA.

4. DETAILS ARE TITLED AS FOLLOWS:



**PIPING IDENTIFICATION SYSTEM**



**PIPING SERVICE**

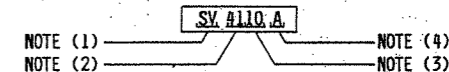
A	AERATION AIR
AA	AGITATION AIR
CLS	CHLORINE SOLUTION
D	DRAIN
DS	DIGESTED SLUDGE
FA	FOUL AIR
FE	FINAL EFFLUENT
IA	INSTRUMENT AIR
ML	MIXED LIQUOR
NG	NATURAL GAS
NTFE	NITRIFICATION TRICKLING FILTER EFFLUENT
NTFI	NITRIFICATION TRICKLING FILTER INFLUENT
OF	OVERFLOW
PD	PUMPED DRAINAGE
PE	PRIMARY EFFLUENT
PS	PRIMARY SLUDGE
PSC	PRIMARY SCUM
RS	RAW SEWAGE
REA	RECIRCULATION AIR
RSS	RETURN SECONDARY SLUDGE
RMP	RAINWATER PIPE
SA	SERVICE AIR
SE	SECONDARY EFFLUENT
SN	SUPERNATANT
SSC	SECONDARY SCUM
STD	STORM DRAIN
TD	TANK DRAIN
TFE	TRICKLING FILTER EFFLUENT
V	VENT
WSS	WASTE SECONDARY SLUDGE
WW	RAW WATER
1W	POTABLE WATER
2W	NONPOTABLE CITY WATER
3W	NO. 3 WATER (SECONDARY EFFLUENT)

**GENERAL NOTES**

- THE NOTE IN THE TITLE BLOCK OF THIS DRAWING WHICH READS "TWO INCHES AT FULL SIZE", APPEARS ON DRAWINGS FOR IDENTIFICATION OF SCALE DISTORTIONS ON HALF SIZE DRAWINGS AND DRAWING REPRODUCTIONS. IT SHALL MEAN THAT THE DRAWING IS FULL SIZE AND THE DRAWING SCALES ACCURATE WHEN THE LENGTH OF THE LINE IS TWO INCHES IF THE LENGTH OF THE LINE IS OTHER THAN TWO INCHES; DRAWING SCALES MUST BE ADJUSTED ACCORDINGLY.
- EXISTING PIPING IS DESIGNATED BY SERVICE RATHER THAN MATERIAL TYPE. MATERIAL TYPES, IF KNOWN, APPEAR OUTSIDE THE PIPING CALLOUT BUBBLE, AND MAY NOT BE THE SAME AS MATERIAL TYPES SPECIFIED FOR NEW PIPING.
- ABBREVIATIONS USED IN THIS CONTRACT DOCUMENT CONFORM TO ANSI Y1.1, UNLESS NOTED OTHERWISE ON DRAWINGS OR IN SPECIFICATION SECTION 01070.

**EQUIPMENT NUMBERING SYSTEM**

MAJOR ITEMS OF MECHANICAL, ELECTRICAL, AND INSTRUMENTATION EQUIPMENT ARE IDENTIFIED BY A CODED NUMBERING SYSTEM, CONSISTING OF ONE TO FOUR LETTERS FOLLOWED BY A NUMBER WHICH IS UNIQUE TO THAT PARTICULAR ITEM. EQUIPMENT NUMBERS ARE DEPICTED IN THE FOLLOWING MANNER:



- EQUIPMENT PREFIX - SEE LISTING THIS DRAWING
- PROCESS AREA CODE - SEE LISTING THIS DRAWING
- SEQUENTIAL NUMBERING OF EQUIPMENT IN PROCESS AREA
- ACCESSORY SUFFIX FOR MAJOR EQUIPMENT
- POWERED VALVES AND ANALOG VALVES HAVE EQUIPMENT NUMBERS AS ABOVE

**EQUIPMENT PREFIX LIST**

AC	AIR CONDITIONER
AHU	AIR HANDLING UNIT
ASH	ANALYSIS SWITCH (DETECTORS AND ANALYZERS)
AV	MOTOR OPERATED DAMPER
B	BLOWER
CP	COMPRESSOR
CV	CONTROL VALVE
F	FAN
FI	FLOW INDICATOR
FLT	FILTER
GDR	GRINDER
M	MOTOR
MCC	MOTOR CONTROL CENTER
MME	MISCELLANEOUS MECHANICAL EQUIPMENT
P	PUMP
PI	PRESSURE INDICATOR
PNL	PANEL
PV	PRESSURE REGULATING OR RELIEVING VALVE
PVL	PRESSURE VESSEL
SC	SPEED CONTROLLER
SCR	SCREEN
SG	SLIDE GATE
SLG	SLUICE GATE
SV	SOLENOID VALVE
T	TANK
V	VALVE
VRV	VACUUM REGULATOR

**BROWN AND CALDWELL**  
DENVER, COLORADO

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
DRAWN LFG  
DESIGNED LFG  
CHECKED AMP  
CHECKED

SUBMITTED: *Al M. Smith* DATE: 9-87  
APPROVED: *Al M. Smith* DATE: 10/87  
APPROVED: *Al M. Smith* DATE:   
City of Boulder



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	AS-BUILTS	JRA	3/90	

CITY OF BOULDER

75TH STREET WASTEWATER TREATMENT PLANT IMPROVEMENTS-PHASE 1A

GENERAL

19354

DRAWING NUMBER  
**G1**  
SHEET NUMBER  
1 OF 167

LOCATION AND VICINITY MAP, REFERENCING SYSTEM

10		HOSE RACK		CONCRETE MOWING STRIP		CONCRETE BLOCK
		FLOOR DRAIN		RETAINING WALL		BRICK OR CAST IRON
9		CLEANOUT		A.C. PAVEMENT (PLAN)		TERRAZZO OR ARTIFICIAL STONE
		UTILITY STATION		EXISTING GRADE CONTOURS		TILE
		FIRE EXTINGUISHER		FINISH GRADE CONTOURS		GRATING SPAN
		FIRE HYDRANT		FINISH GRADE SPOT ELEVATION		CHECKER PLATE
8		BURIED VALVE		TOP OF CURB ELEVATION GUTTER ELEVATION		STEEL OR STAINLESS STEEL
		MANHOLE		SWALE OR DITCH		ALUMINUM
		HOISTING HOOK		SLOPE (3 HOR. TO 1 VERT.)		WOOD
		CONNECTING LINES, SINGLE LINE SCHEMATIC DRAWINGS		EMBANKMENT		RIGID INSULATION (UNLESS OTHERWISE NOTED)
7		NON-CONNECTING LINES, SINGLE LINE SCHEMATIC DRAWINGS		EXPANSION JOINT CONCRETE PAVEMENT		NEOPRENE
		AT		DUMMY CONSTRUCTION JOINT CONCRETE PAVEMENT		OPENING OR DEPRESSION IN SLAB OR WALL
		AND		JOINT FILLER		OPENING WITH GRATING COVER
6		ROUND OR DIAMETER		PVC WATER STOP		OPENING WITH CHECKER & COVER
		ANGLE		TEST HOLE		EXIST. EQUIP. OR MATERIALS TO BE REMOVED
		CENTER LINE		CATCH BASIN OR INLET		TO BE BUILT FOR FUTURE REMOVAL
		PLATE OR PROPERTY LINE		PLASTIC LINING		NATURAL GROUND OR FINISH GRADE
5		DOOR NUMBER		SLIDE GATE OPENING AND DESIGNATION		FINISH GRADE OR, IF ADJACENT TO CLAYSTONE, INDICATES NON-EXPANSIVE CLAY
		ROOM NUMBER		REINFORCEMENT IN SECTION		ROCK OR GRAVEL
		PIPING DESIGNATION SEE DWG G1		REINFORCEMENT PLAN OR ELEVATION		EXPANSIVE CLAYSTONE BEDROCK
		EQUIPMENT DESIGNATION SEE DWG G1		CONCRETE		
4		PERMANENT BENCH MARK ON SURVEY MONUMENT		EXISTING CONCRETE		
		RAILROAD (SINGLE TRACK)		PRECAST CONCRETE		
		RAILROAD (DOUBLE TRACK)		MORTAR, GROUT OR PLASTER		
3		EXISTING EQUIPMENT OR STRUCTURES				
		PROPERTY LINE OR MATCH LINE				
		CENTER LINE				
2		SECTION OUTLINE OR BOUNDARY				
		FENCE				
		HANDRAIL				
1		CONCRETE CURB AND GUTTER				

NOTES:  
 1. FOR ADDITIONAL STANDARD SYMBOLS SEE DWGS. P1, P2, M7 AND E1.  
 2. SYMBOLS ARE FOR REFERENCE ONLY, NOT ALL SYMBOLS ARE USED IN THESE CONTRACT DRAWINGS.

**BROWN AND CALDWELL**  
 DENVER, COLORADO

SUBMITTED: *[Signature]* DATE: 9-87  
 APPROVED: *[Signature]* DATE: 10/87  
 APPROVED: *[Signature]* DATE:

LINE IS 2 INCHES  
 AT FULL SIZE  
 (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN JPC  
 DESIGNED JPC  
 CHECKED AMP  
 CHECKED



REVISIONS			
ZONE	REV.	DESCRIPTION	BY DATE APP.
	1	AS-BUILTS	JRA 3/90

CITY OF BOULDER

75TH. STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

GENERAL 19355

GENERAL SYMBOLS

DRAWING NUMBER	G2
SHEET NUMBER	2 OF 167

# PROJECT DESIGN DATA

PHASE 1A    PHASE 1B    ULTIMATE

### WASTEWATER CHARACTERISTICS

FLOWS, MGD			
MINIMUM DAILY FLOW (MDF)	7	8	10
AVERAGE ANNUAL FLOW (AAF)	13	16	20
AVERAGE DAILY FLOW (ADF)	16	20	25
PEAK DRY WEATHER FLOW (PDWF)	22	27	34
PEAK WET WEATHER FLOW (PWWF)	37	46	58

LOADINGS AT AAF, LB/DAY <sup>5</sup>			
BOD <sub>5</sub>	18,430	22,680	28,360
SUSPENDED SOLIDS	17,350	21,350	26,690
AMMONIA NITROGEN (NH <sub>3</sub> -N)	1,950	2,400	3,000

### PRELIMINARY TREATMENT FACILITIES

PRETREATMENT BYPASS CHANNEL			
WIDTH, FT	-	6	6
CAPACITY, MGD	-	58	58

PARSHALL FLUME <sup>1</sup>			
NUMBER	1	1	1
THROAT WIDTH, FT	5	5	5
CAPACITY, MGD	58	58	58

BAR SCREENS <sup>1</sup>			
TYPE	MECHANICAL	MECHANICAL	MECHANICAL
NUMBER	2	2	2
WIDTH OF CLEAR OPENING, IN	0.75	0.75	0.75
CHANNEL WIDTH, FT	4.5	4.5	4.5
HYDRAULIC CAPACITY, EACH, MGD	58	58	58

GRIT REMOVAL TANKS <sup>1</sup>			
TYPE	AERATED	AERATED	AERATED
NUMBER OF BASINS	2	2	2
DIMENSION, EACH BASIN			
WIDTH, FT	16.9	16.9	16.9
LENGTH, FT	35.7	35.7	35.7
DESIGN CAPACITY, EACH BASIN, MGD	29	29	29
NUMBER OF COMPRESSORS	4	4	4
CAPACITY, EACH COMPRESSOR, CFM	70	70	70
AIR FLOW PER FOOT OF BASIN, CFM	3	3	3

GRIT HANDLING <sup>1</sup>			
SEPARATOR TYPE	CYCLONIC	CYCLONIC	CYCLONIC
CLASSIFIER TYPE	SCREW	SCREW	SCREW
CAPACITY, CU FT/HR	54	54	54

### PRIMARY TREATMENT FACILITIES

PRIMARY LIFT PUMPS			
TYPE	-	SCREW	SCREW
NUMBER	-	2	2
CAPACITY, EACH, MGD	-	13.5	13.5

PRIMARY SEDIMENTATION TANKS <sup>1</sup>			
TYPE	CIRCULAR	CIRCULAR	CIRCULAR
NUMBER	3	4	4
DIAMETER, FT	2 @ 80	2 @ 80	2 @ 80
SIDEWATER DEPTH, FT	1 @ 140	2 @ 140	2 @ 140
SURFACE AREA, SQ FT	7,16	7,16	7,16
OVERFLOW RATE AT PWWF, GPD/SQ FT	25,450	40,840	40,840
	1,450	1,126	1,420

PRIMARY SLUDGE AND SCUM PUMPS			
TYPE	PISTON <sup>1</sup>	ROTARY LOBE	ROTARY LOBE
NUMBER	4	4	4
CAPACITY, EACH, GPM	100	2 @ 40	2 @ 40
		2 @ 100	2 @ 100

CENTRATE PUMPS			
TYPE	ROTARY LOBE	ROTARY LOBE	ROTARY LOBE
NUMBER	2	2	2
CAPACITY, GPM	220	220	220

PHASE 1A    PHASE 1B    ULTIMATE

### SECONDARY TREATMENT FACILITIES

SECONDARY LIFT PUMPS			
TYPE, 2-SPEED	VERTICAL MIXED-FLOW	VERTICAL MIXED-FLOW	VERTICAL MIXED-FLOW
NUMBER	6	6	6
CAPACITY, MGD, HIGH SPEED, EACH	3 @ 9.2 3 @ 15.1	3 @ 9.2 3 @ 15.1	3 @ 11 3 @ 19

TRICKLING FILTERS <sup>1</sup>			
TYPE	CIRCULAR ROCK	CIRCULAR ROCK	CIRCULAR ROCK
NUMBER	4	4	4
DIAMETER, FT			
NOS. 1 AND 2	155	155	155
NOS. 3 AND 4	200	200	200
MEDIA DEPTH, FT	8	8	8
SURFACE AREA, SQ FT			
NOS. 1 AND 2, EACH	18,870	18,870	18,870
NOS. 3 AND 4, EACH	31,410	31,410	31,410
TOTAL	100,560	100,560	100,560
MEDIA VOLUME, CU FT			
NOS. 1 AND 2, EACH	150,960	150,960	150,960
NOS. 3 AND 4, EACH	251,280	251,280	251,280
TOTAL	804,480	804,480	804,480
ROTARY DISTRIBUTOR FLOW RANGE, MGD			
NOS. 1 AND 2, EACH, W/RECYCLE	3.5-10.4 <sup>1</sup>	3.5-10.4 <sup>1</sup>	5-11
NOS. 3 AND 4, EACH, W/RECYCLE	6-16.4 <sup>1</sup>	6-16.4 <sup>1</sup>	9-18
ORGANIC LOADING, 16 BOD/1000 CF	20.0	20.0	25.0

INTERSTAGE LIFT PUMPS			
TYPE	VERTICAL MIXED-FLOW	VERTICAL MIXED-FLOW	VERTICAL MIXED-FLOW
NUMBER	4	4	4
CAPACITY, EACH, MGD	15.3	15.3	19.3

SOLIDS CONTACT TANK			
NUMBER OF PASSES	4	4	6
SIZE PER PASS			
LENGTH, FT	86	86	86
WIDTH, FT	30	30	30
LIQUID DEPTH, FT	16	16	16
VOLUME, GAL	308,800	308,800	308,800
TOTAL HYDRAULIC DETENTION, AT ADF, MIN	84	84	100
SOLIDS RETENTION TIME, DAYS			

AERATION BLOWERS			
NUMBER	4	4	5
CAPACITY, SCFM	1,250	1,250	1,250

SECONDARY CLARIFIERS			
TYPE	CIRCULAR	CIRCULAR	CIRCULAR
NUMBER	3	3	4
DIAMETER, FT	110	110	110
DEPTH, FT	16	16	16
SURFACE AREA, SQ FT	9,500	9,500	9,500
TOTAL SURFACE AREA, SQ FT	28,500	28,500	38,000
OVERFLOW RATE AT PWWF, GPD/SF	1,610	1,610	1,530

SECONDARY SLUDGE PUMPS			
TYPE	HORIZONTAL NON-CLOG CENTRIFUGAL	HORIZONTAL NON-CLOG CENTRIFUGAL	HORIZONTAL NON-CLOG CENTRIFUGAL
NUMBER	2	2	2
CAPACITY, GPM	400	400	400

PHASE 1A    PHASE 1B    ULTIMATE

RETURN SLUDGE PUMPS, 2-SPEED			
TYPE	HORIZONTAL MIXED-FLOW	HORIZONTAL MIXED-FLOW	HORIZONTAL MIXED-FLOW
NUMBER	5	5	6
CAPACITY, GPM, HIGH SPEED, EACH	3,050	3,050	3,050
MAXIMUM RECYCLE AT ADF	1.01	1.01	1.01

SECONDARY SCUM PUMPS			
TYPE	ROTARY-LOBE	ROTARY-LOBE	ROTARY-LOBE
NUMBER	3	3	4
CAPACITY, GPM	20	20	20

### DISINFECTION FACILITIES

CHLORINE CONTACT BASIN			
VOLUME, GAL	423,000 <sup>1</sup>	960,000	1,222,000
DEPTH, FT	8	10	10
HYDRAULIC DETENTION TIME AT PWWF, MIN	16.5	30	30

### AMMONIA REMOVAL FACILITIES

NTF LIFT PUMPS			
TYPE	VERTICAL MIXED-FLOW	VERTICAL MIXED-FLOW	VERTICAL MIXED-FLOW
NUMBER	2	2	6
CAPACITY, MGD, HIGH SPEED	5.8	5.8	14.5 <sup>2</sup>
DRIVE	CONSTANT SPEED	CONSTANT SPEED	VARIABLE FREQUENCY

NTF RECIRCULATION PUMPS			
TYPE	HORIZONTAL CENTRIFUGAL	HORIZONTAL CENTRIFUGAL	HORIZONTAL CENTRIFUGAL
NUMBER	1	1	4 <sup>2</sup>
CAPACITY, MGD	2.5	2.5	2.5

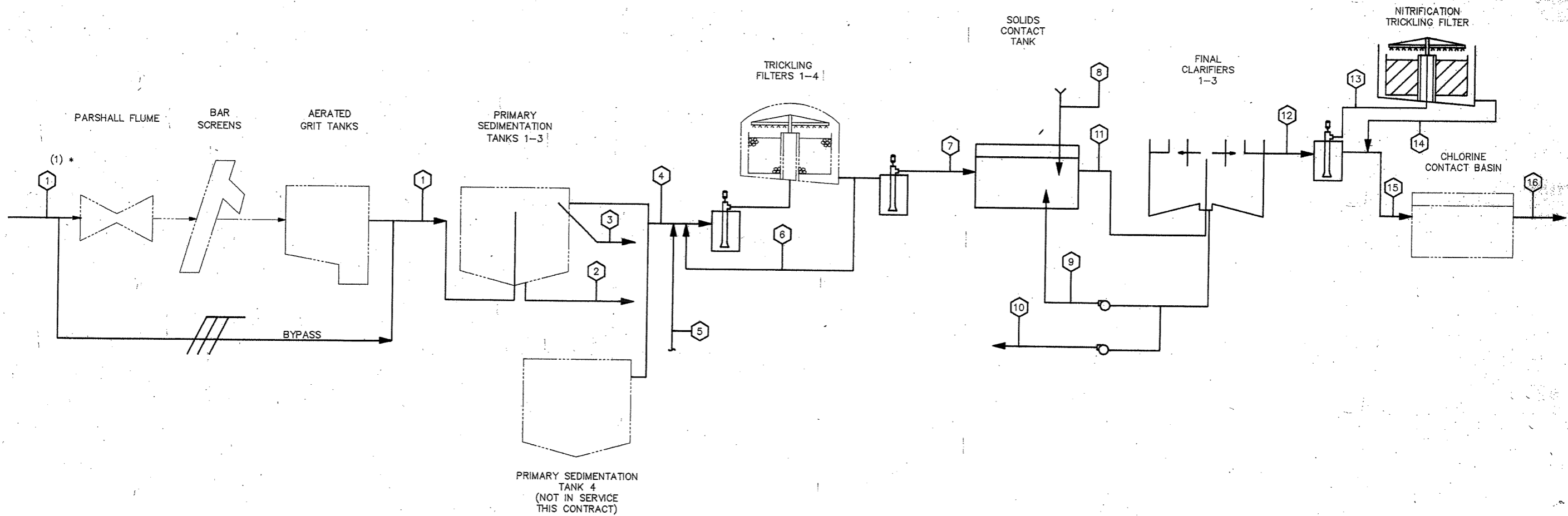
NTF RECYCLE PUMPS			
TYPE	-	-	VERTICAL MIXED-FLOW
NUMBER	-	-	2 <sup>2</sup>
CAPACITY, MGD, HIGH SPEED	-	-	5.0 <sup>2</sup>
DRIVE	-	-	VARIABLE FREQUENCY

NITRIFICATION TRICKLING FILTERS			
MEDIA TYPE	42 SF/CF PLASTIC	42 SF/CF PLASTIC	42 SF/CF PLASTIC
NUMBER	1	1	4 <sup>2</sup>
DIAMETER, FT	80	80	80
MEDIA DEPTH, FT	16	16	16
TOTAL MEDIA VOLUME, CU FT	80,400	80,400	321,700
NETTING RATE, GPM/SF	.80 <sup>3</sup>	.80 <sup>3</sup>	.69 <sup>4</sup>
TOTAL MEDIA SURFACE AREA, MILLION SF	3.4	3.4	13.5
TOTAL NH <sub>3</sub> LOAD, LB/DAY	870	870	3,000
SF MEDIA SURFACE AREA/LB, NH <sub>3</sub> OXIDIZED @ AAF	4,650	4,650	5,400
ROTARY DISTRIBUTOR FLOW RANGE, MGD	2.0-11.6	2.0-11.6	5.0-14.5

**NOTES:**  
<sup>1</sup>EXISTING  
<sup>2</sup>ASSUMING FULL NITRIFICATION TO 3 MG/L REQUIRED.  
<sup>3</sup>WITH ONE 5.8 MGD NTF LIFT PUMP RUNNING.  
<sup>4</sup>AT AAF OF 20 MGD, NO RECYCLE.  
<sup>5</sup>DOES NOT INCLUDE SEPTAGE AND THICKENER OVERFLOW.

	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"=SCALE ACCORDINGLY)			REVISIONS		CITY OF BOULDER	GENERAL <b>19356</b>	DRAWING NUMBER <b>G3</b>								
	FILE 3030			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>ZONE</th> <th>REV.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> <th>APP.</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>AS-BUILTS</td> <td>JRA</td> <td>3/90</td> <td></td> </tr> </tbody> </table>	ZONE				REV.	DESCRIPTION	BY	DATE	APP.			AS-BUILTS
ZONE	REV.	DESCRIPTION	BY	DATE	APP.											
		AS-BUILTS	JRA	3/90												
SUBMITTED: <i>[Signature]</i> DATE: 9/87	DRAWN: LFG															
APPROVED: <i>[Signature]</i> DATE: 10/87	DESIGNED: AMP															
APPROVED: _____ DATE: _____	CHECKED: AMP															
City of Boulder	CHECKED: _____															



STATION	1				2		3				4				5		6				7				8		9		10		11				12				13		14		15				16			
	WASTEWATER				SLUD.	SCUM	PRIMARY EFFLUENT				CENTRATE	TRK. FLT. RECYCLE		TRK. FLT. EFFLUENT		PROC. AIR		RETURN SLUDGE		WASTE SLD.	MIXED LIQUOR				SECOND. EFFLUENT <sup>(3)</sup>				NTRIFCATION IF INFLNT	NTRIFCATION IF EFFLNT	COMBINED EFFLUENT				FINAL EFFLUENT															
CONDITION	AAF	MIN	PDWF	PWWF	AVG	AVG	AAF	MIN	PDWF	PWWF	AVG	MIN	MAX	AAF	MIN	PDWF	PWWF	AT AAF	MAX	MIN	MAX		AVG <sup>(4)</sup>	MIN	MAX	AAF	MIN	PDWF	PWWF	AVG	AVG	AAF	MIN	PDWF	PWWF	AAF	MIN	PDWF	PWWF	AAF	MIN	PDWF	PWWF							
FLOW, MGD	16	8	27	46	-	-	16	8	27	46	.06	2	38	16	8	27	46	-	-	7.8	13.2	.58 <sup>(2)</sup>	23.8	15.8	59.2	16	8	27	46	5.8	5.8	16	8	27	46	16	8	27	46	16	8	27	46							
FLOW, GPM	-	-	-	-	300 <sup>(2)</sup>	100 <sup>(2)</sup>	-	-	-	-	220	-	-	-	-	-	-	-	-	5400	9150	400 <sup>(2)</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
TOTAL BOD'S #/D	24,700	12,350	41,681	71,013	8645	-	16,055	8028	27,093	46,158	1500	-	-	4043	2022	6823	11624	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
SOL. BOD'S #/DAY	20,995	10,498	35,429	60,361	7348	-	13,647	6823	23,029	39,234	1275	-	-	3437	1718	5800	9881	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
SS #/DAY	23,400	11,700	39,488	67,275	14,040	-	9360	4680	15,795	26,910	1500	-	-	-	-	-	-	-	-	341,523	577,962	11,777	347,361	230,601	864,024	1334	-	-	-	484	968	-	-	-	-	-	-	-	-	-	-	-	-							

\* (1) INCLUDES SEPTAGE AND THICKENER OVERFLOW  
 (2) INTERMITTENT FLOW  
 (3) BASED ON MLVSS OF 1400 mg/l, 16 MGD, 10 DEGREES C.  
 (4) BASED ON AAF + MIN RSS

**BROWN AND CALDWELL**  
 DENVER, COLORADO

PROJECT MANAGER  
 PROJECT MANAGER  
 PROJECT MANAGER

DATE: 9-87  
 DATE: 10/87  
 DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030

DRAWN JPC  
 DESIGNED PMP  
 CHECKED AMP  
 CHECKED



ZONE	REV	DESCRIPTION	BY	DATE	APP.
	1	AS-BUILTS	JRA	3/90	

CITY OF BOULDER

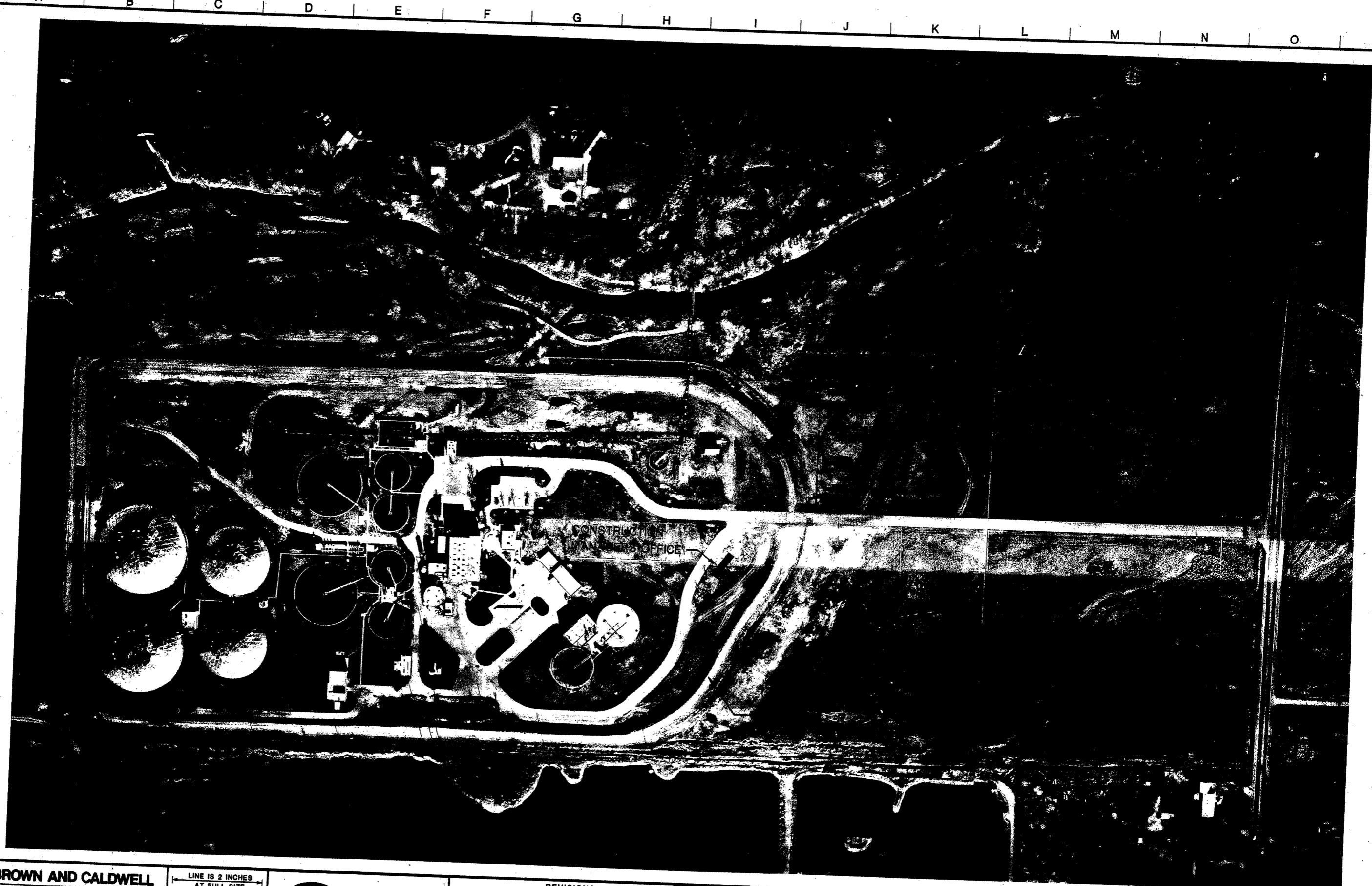
75TH. STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

GENERAL 19357

PROCESS FLOW DIAGRAM

DRAWING NUMBER  
**G4**

SHEET NUMBER  
 4 OF 167



**BC BROWN AND CALDWELL**  
DENVER, COLORADO

LINE IS 2 INCHES  
AT FULL SIZE  
(IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
DRAWN DAP  
DESIGNED AMP  
CHECKED PMP  
CHECKED



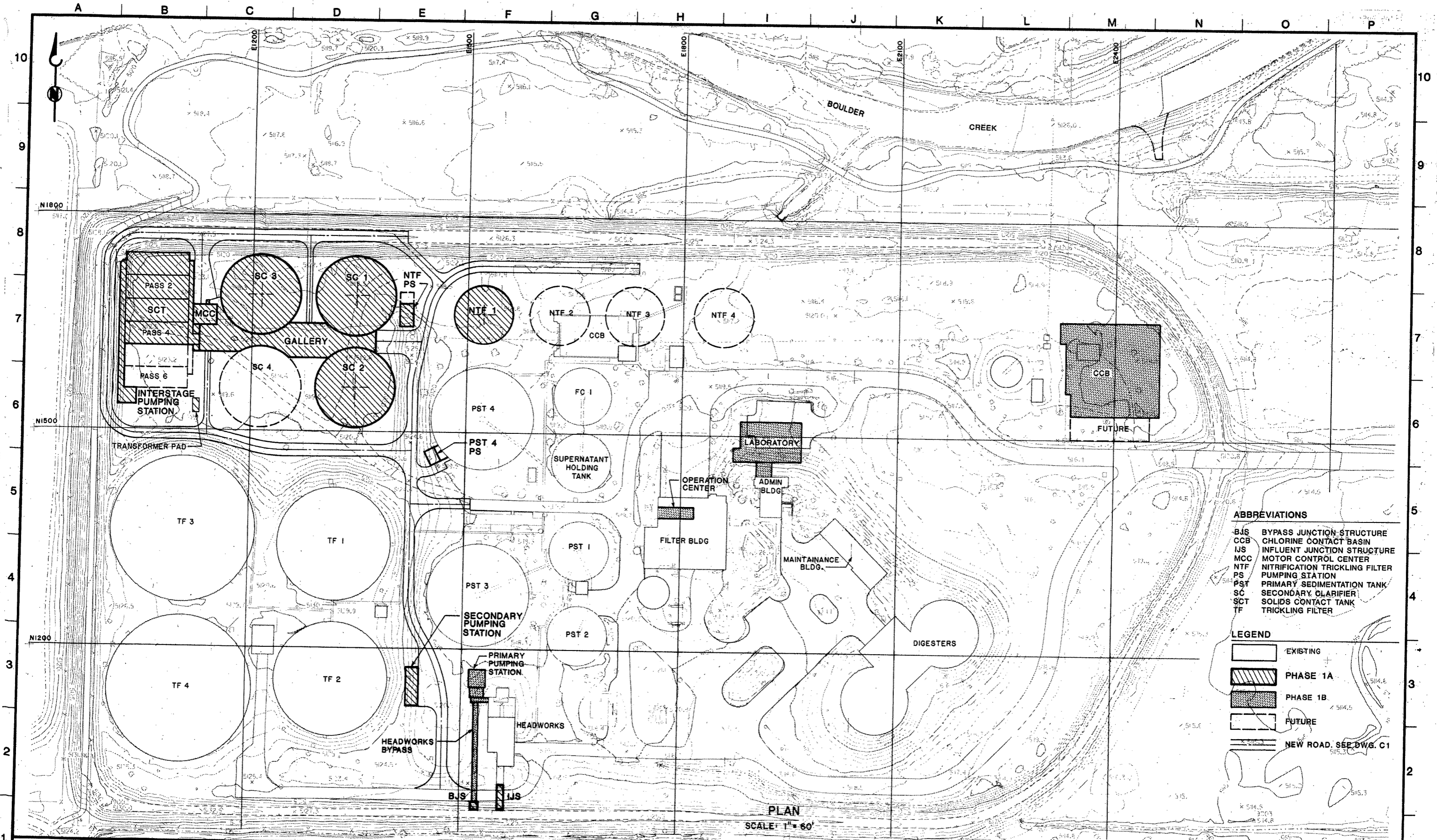
SUBMITTED: *Alan M. Pratt* DATE: 9-87  
APPROVED: *Alan M. Pratt* DATE: 10/87  
APPROVED: *Brown and Caldwell* DATE:

REVISIONS			
ZONE	REV.	DESCRIPTION	BY DATE APP.
	1	AS-BUILTS	JRA 9/90

CITY OF BOULDER  
75TH STREET  
WASTEWATER TREATMENT PLANT  
IMPROVEMENTS-PHASE 1A

GENERAL 19358  
EXISTING SITE PLAN

DRAWING NUMBER  
**G5**  
SHEET NUMBER  
5 OF 167



- ABBREVIATIONS**
- BJS BYPASS JUNCTION STRUCTURE
  - CCB CHLORINE CONTACT BASIN
  - IJS INFLUENT JUNCTION STRUCTURE
  - MCC MOTOR CONTROL CENTER
  - NTF NITRIFICATION TRICKLING FILTER
  - PS PUMPING STATION
  - PST PRIMARY SEDIMENTATION TANK
  - SC SECONDARY CLARIFIER
  - SCT SOLIDS CONTACT TANK
  - TF TRICKLING FILTER

- LEGEND**
- EXISTING
  - PHASE 1A
  - PHASE 1B
  - FUTURE
  - NEW ROAD. SEE DWG. C.1

PLAN  
SCALE: 1" = 60'

**BC BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *Alan M. Pault* DATE: 9-87  
 APPROVED: *Chas. H. ...* DATE: 10/87  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

LINE IS 2 INCHES  
AT FULL SIZE  
(IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN LFG  
 DESIGNED DAP  
 CHECKED AMP  
 CHECKED \_\_\_\_\_

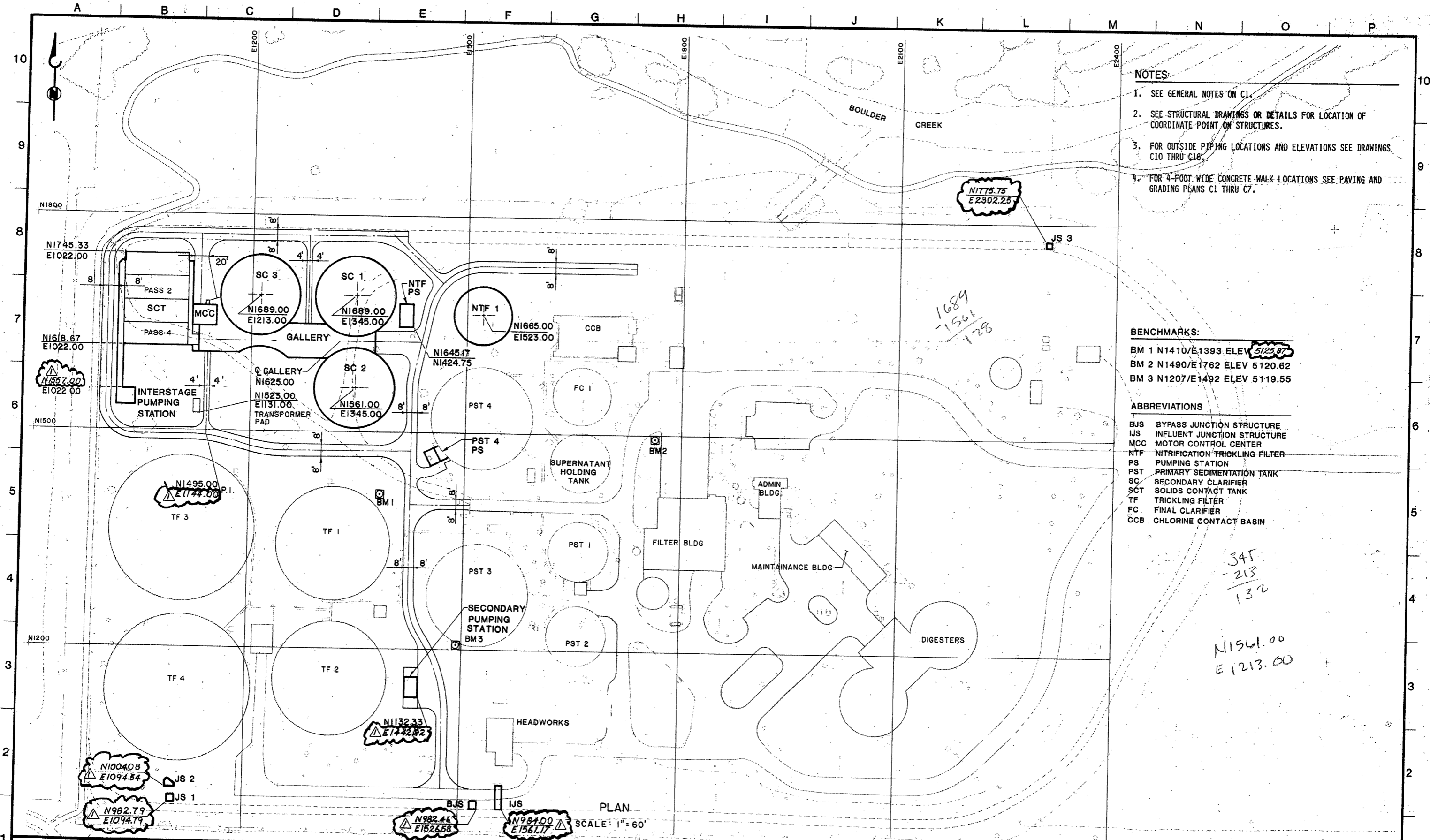


ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	AS-BUILT	JRA	3/90	

CITY OF BOULDER

75TH. STREET  
WASTEWATER TREATMENT PLANT  
IMPROVEMENTS-PHASE 1A

GENERAL **19359** DRAWING NUMBER  
 SITE PLAN **G6**  
 SHEET NUMBER  
 6 OF 167



- NOTES**
1. SEE GENERAL NOTES ON C1.
  2. SEE STRUCTURAL DRAWINGS OR DETAILS FOR LOCATION OF COORDINATE POINT ON STRUCTURES.
  3. FOR OUTSIDE PIPING LOCATIONS AND ELEVATIONS SEE DRAWINGS C10 THRU C16.
  4. FOR 4-FOOT WIDE CONCRETE WALK LOCATIONS SEE PAVING AND GRADING PLANS C1 THRU C7.

- BENCHMARKS:**
- BM 1 N1410/E1393 ELEV 5125.87
  - BM 2 N1490/E1762 ELEV 5120.62
  - BM 3 N1207/E1492 ELEV 5119.55

- ABBREVIATIONS**
- BJS BYPASS JUNCTION STRUCTURE
  - IJS INFLUENT JUNCTION STRUCTURE
  - MCC MOTOR CONTROL CENTER
  - NTF NITRIFICATION TRICKLING FILTER
  - PS PUMPING STATION
  - PST PRIMARY SEDIMENTATION TANK
  - SC SECONDARY CLARIFIER
  - SCT SOLIDS CONTACT TANK
  - TF TRICKLING FILTER
  - FC FINAL CLARIFIER
  - CCB CHLORINE CONTACT BASIN

PLAN

SCALE: 1" = 60'

**BC BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *[Signature]* DATE: 9-87  
 APPROVED: *[Signature]* DATE: 10/87  
 APPROVED: *[Signature]* DATE:

LINE IS 2 INCHES  
AT FULL SIZE  
(IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN BC  
 DESIGNED DAP  
 CHECKED PMP  
 CHECKED



ZONE REV	DESCRIPTION	BY	DATE	APP.
AS-BUILTS		JRA	3/90	

CITY OF BOULDER

75TH STREET  
WASTEWATER TREATMENT PLANT  
IMPROVEMENTS-PHASE 1A

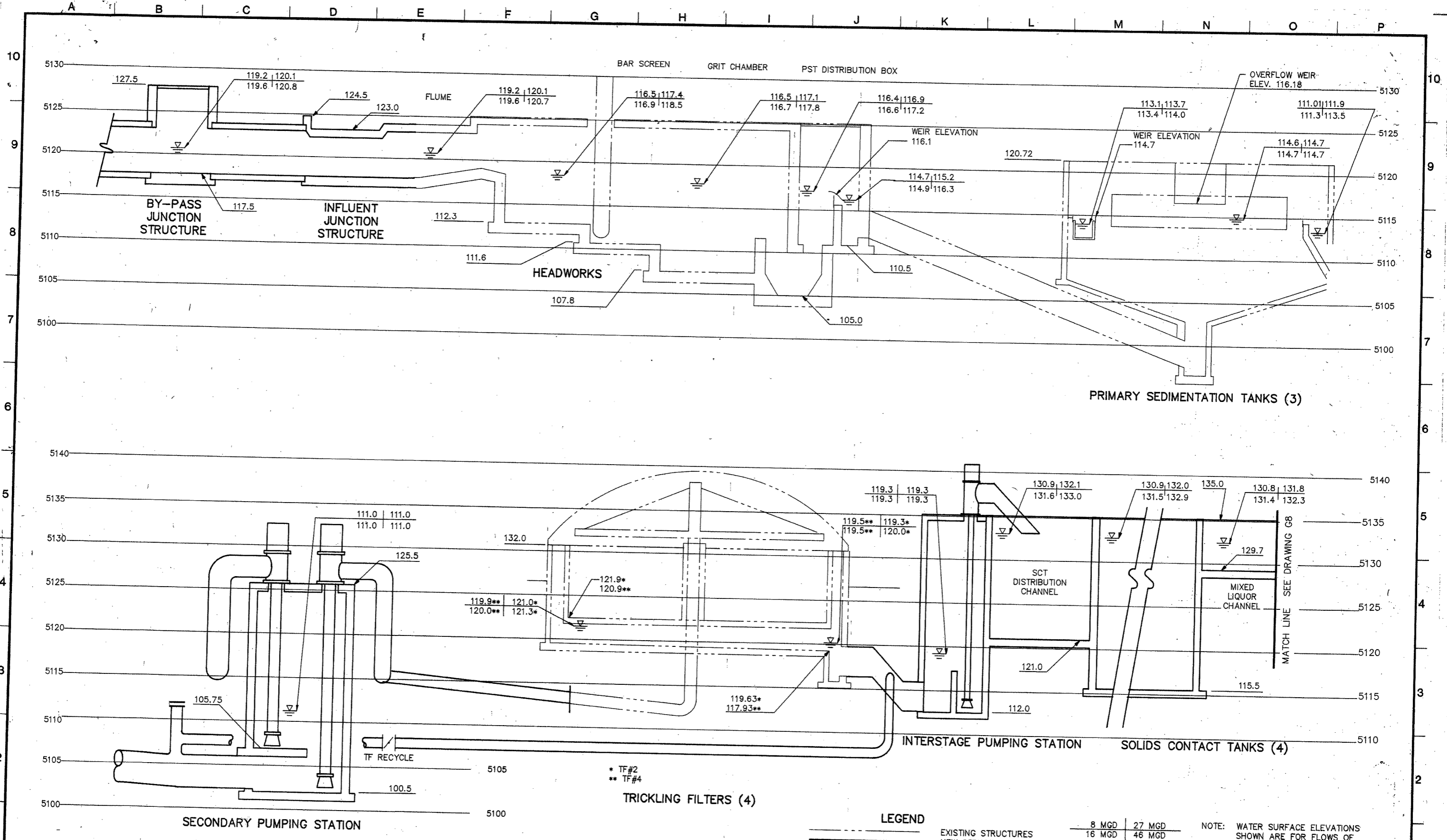
GENERAL **19360**

PLANT LAYOUT - SURVEY CONTROL

DRAWING NUMBER  
**G7**

SHEET NUMBER  
7 OF 167



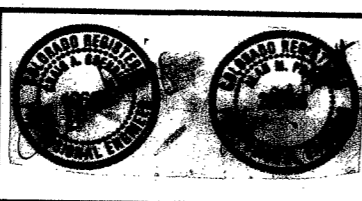


**BC BROWN AND CALDWELL**  
 DENVER, COLORADO

SUBMITTED: *Alan M. Smith* DATE: 9-87  
 APPROVED: *John H. Brown* DATE: 12/87  
 APPROVED: *John H. Brown* DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN JPC  
 DESIGNED PMP  
 CHECKED AMP  
 CHECKED \_\_\_\_\_



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	AS-BUILT	JRA	3/90	

CITY OF BOULDER

75TH. STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

GENERAL **19361**

HYDRAULIC PROFILE I

DRAWING NUMBER **G8**

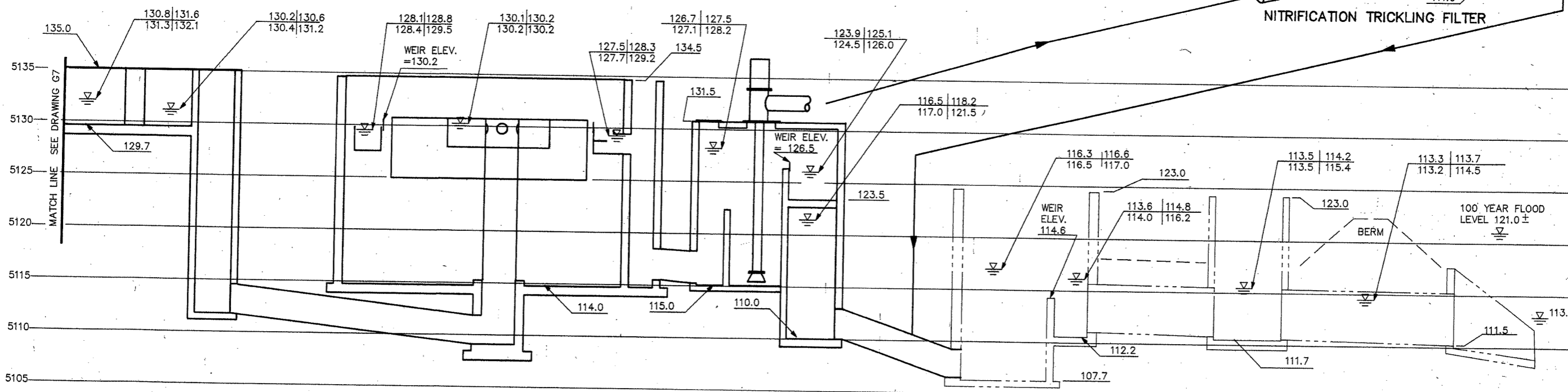
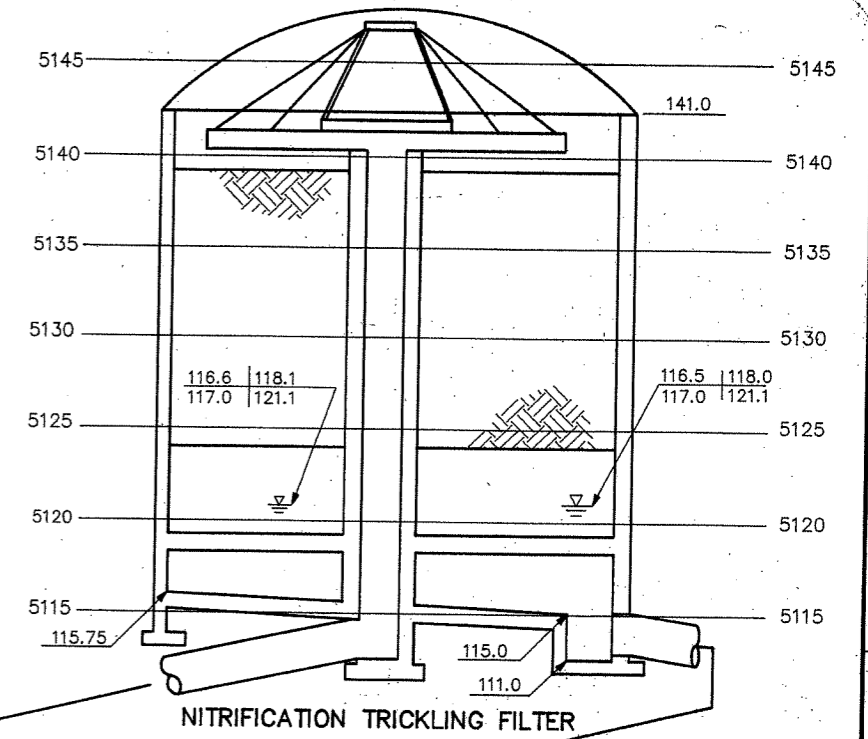
SHEET NUMBER 8 OF 167

**LEGEND**

- EXISTING STRUCTURES
- NEW STRUCTURES

8 MGD	27 MGD
16 MGD	46 MGD

NOTE: WATER SURFACE ELEVATIONS SHOWN ARE FOR FLOWS OF 46 MGD



CUT-THROAT FLUMES (3)      SECONDARY CLARIFIERS (3)      NITRIFICATION TRICKLING FILTER PUMPING STATION      CHLORINE CONTACT BASIN      EFFLUENT STRUCTURE      OUTLET STRUCTURE

**BC BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *Alan M. Smith* DATE: 4-87  
APPROVED: *John A. King* DATE: 1/87  
APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
DRAWN JPC  
DESIGNED PMP  
CHECKED AMP  
CHECKED \_\_\_\_\_



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
1		AS-BUILT	JRA	3/90	

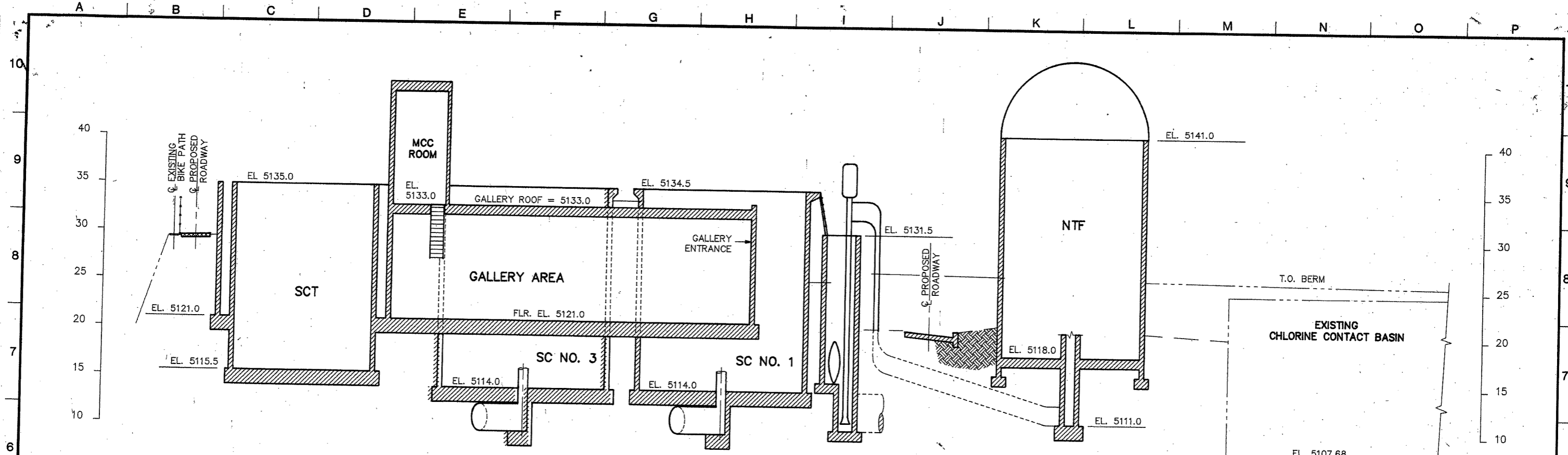
CITY OF BOULDER

75TH. STREET WASTEWATER TREATMENT PLANT IMPROVEMENTS-PHASE 1A

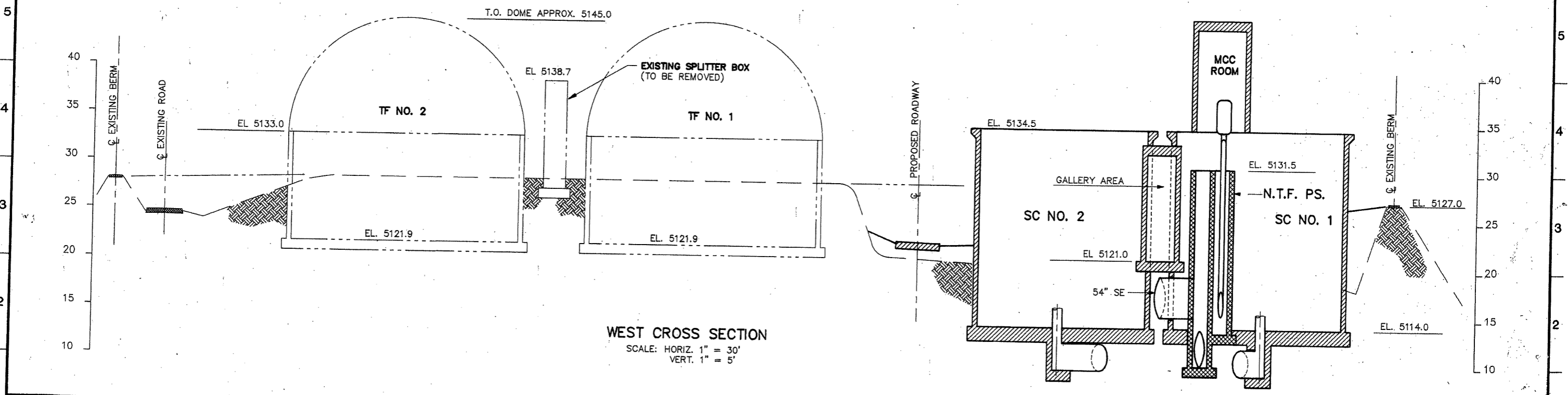
GENERAL **19362**

HYDRAULIC PROFILE 2

DRAWING NUMBER **G9**  
SHEET NUMBER 9 OF 167



**NORTH CROSS SECTION**  
 SCALE: HORIZ. 1" = 30'  
 VERT. 1" = 5'



**WEST CROSS SECTION**  
 SCALE: HORIZ. 1" = 30'  
 VERT. 1" = 5'

**BC BROWN AND CALDWELL**  
 DENVER, COLORADO

SUBMITTED: *Alex McDowell* DATE: 9-87  
 APPROVED: *Ch. Boehring* DATE: 10/87  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN JPC  
 DESIGNED WIH  
 CHECKED PMP  
 CHECKED \_\_\_\_\_



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
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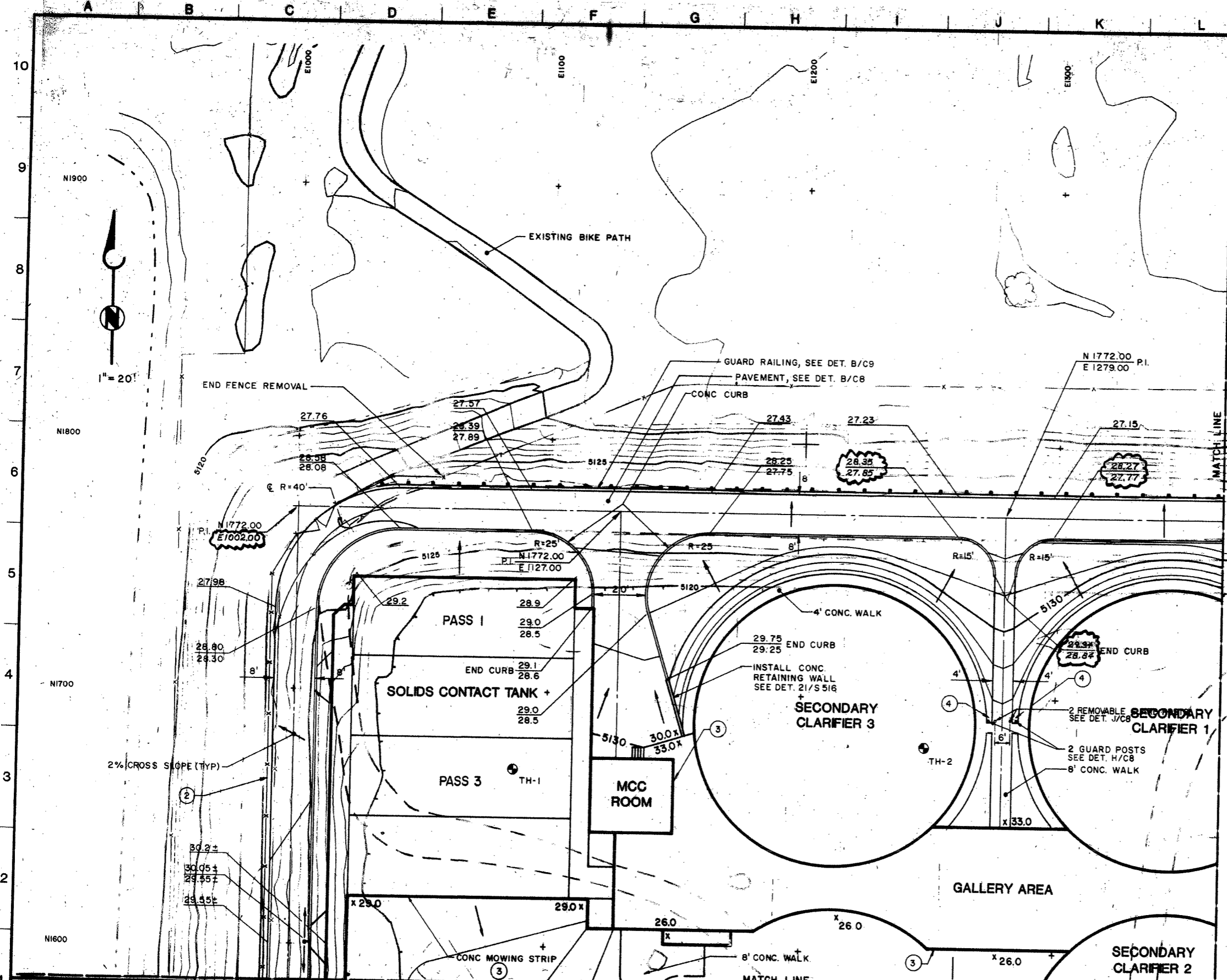
CITY OF BOULDER

75TH. STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

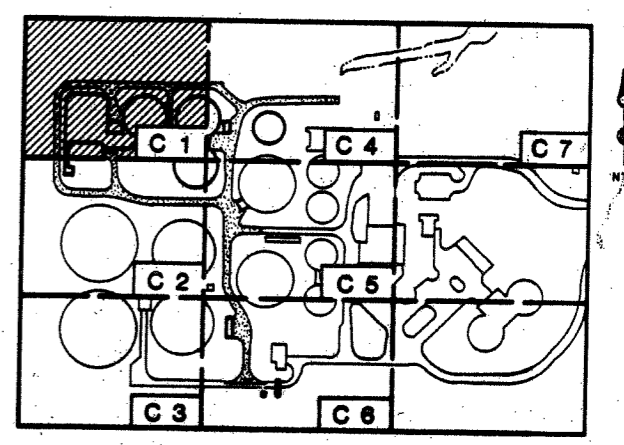
GENERAL **19363**

PLANT CROSS SECTIONS

DRAWING NUMBER  
**G10**  
 SHEET NUMBER  
 10 OF 167



- GENERAL NOTES:**
1. SUBTRACT 0.13 FEET FROM SITE PLANT ELEVATIONS TO GET U.S.G.S DATUM.
  2. CO-ORDINATE GRID SYSTEM BASED ON LOCAL DATUM.
  3. TOPOGRAPHY FROM AERIAL PHOTOGRAPHY DATED 11/23/86.
  4. REFER TO SPECIFICATIONS FOR EARTHWORK AND MATERIAL REQUIREMENTS.
  5. TH DENOTES "TEST HOLE" LOCATIONS. FOR SUMMARY SEE SPECIFICATION SECTION 01055.
  6. ALSO SEE GENERAL NOTES ON C10.
  7. PROPOSED GRADES SHOWN ARE FINISHED GRADES. DUE TO CONSTRUCTION PHASING, SUBTRACT 0.5 FEET TO OBTAIN DESIRED SUBGRADE FOR THIS CONTRACT. IN AREAS OF NEW GRADING ROADWAYS, WALKWAYS, MOWING STRIPS, STRUCTURES SHALL BE CONSTRUCTED TO THE FINISHED GRADE INDICATED.
- NOTES:**
1. SEE GENERAL NOTES ON DRAWING C1.
  2. REMOVE SALVAGE AND STORE EXISTING FENCE, AS SHOWN. REPLACE FOLLOWING COMPLETION OF OTHER WORK IN AREA. PROVIDE TEMPORARY FENCING DURING CONSTRUCTION TEMPORARY FENCING MATERIAL SHALL MEET WITH CONSTRUCTION MANAGER'S APPROVAL.
  3. PROVIDE CONCRETE MOWING STRIP AROUND ALL NEW STRUCTURES. EXCEPT WHERE SIDEWALKS OR WALKWAYS ARE ADJACENT TO STRUCTURES. SEE DET. F/C8.
  4. LOCATE WEIGHT LIMIT SIGN. SEE DETAIL I/C8.



**KEY PLAN**

**BROWN AND CALDWELL**  
DENVER, COLORADO

PROJECT: *Alan M. Pratt*  
SUBMITTED: *CH Johnson* DATE: 9-87  
APPROVED: *CH Johnson* DATE: 1/87  
APPROVED: *AMP* DATE:   
City of Boulder

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
DRAWN DAP/JPC  
DESIGNED DAP  
CHECKED AMP  
CHECKED



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	AS-BUILT	JRA	3/90	

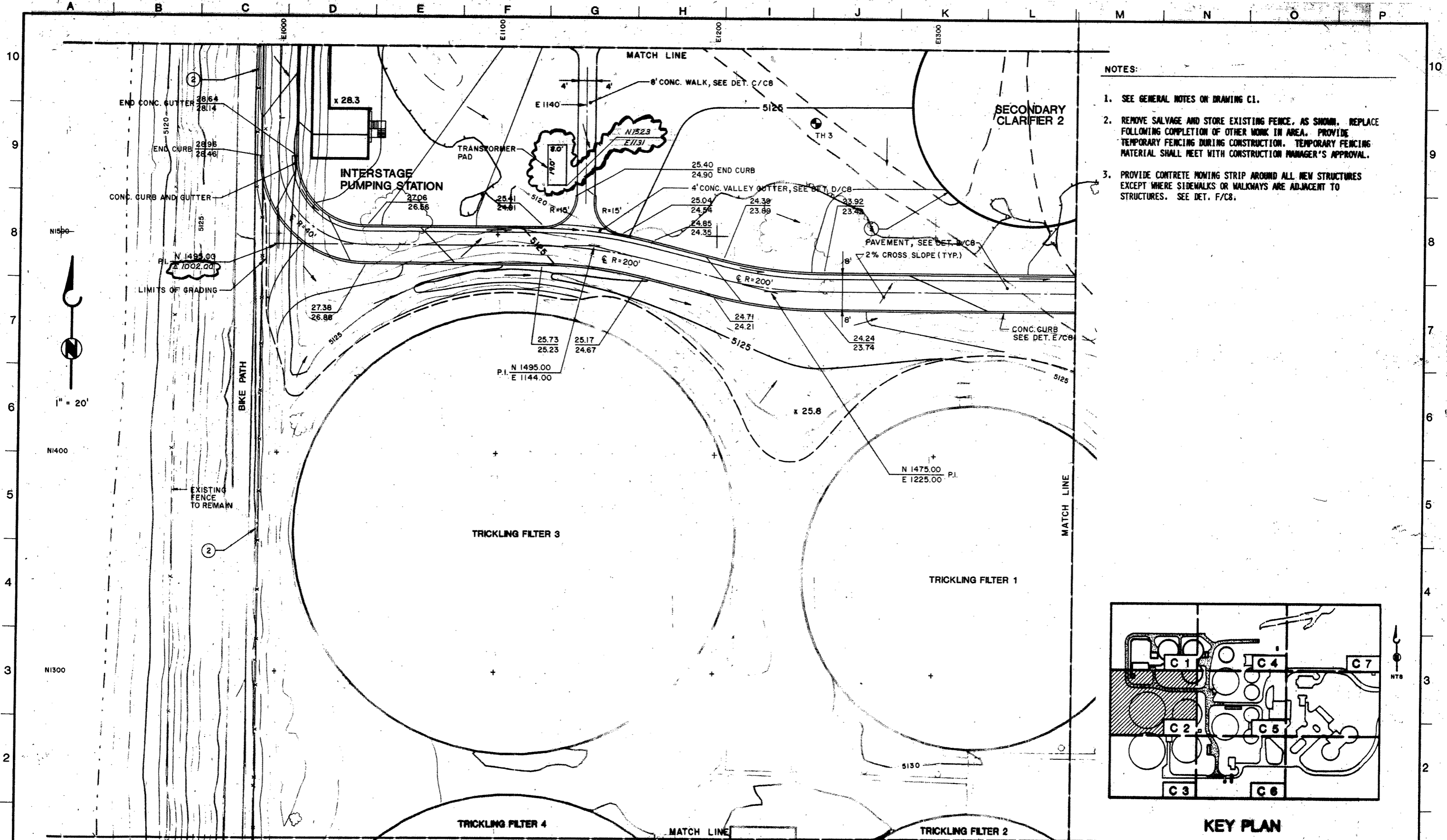
CITY OF BOULDER

75TH STREET  
WASTEWATER TREATMENT PLANT  
IMPROVEMENTS-PHASE 1A

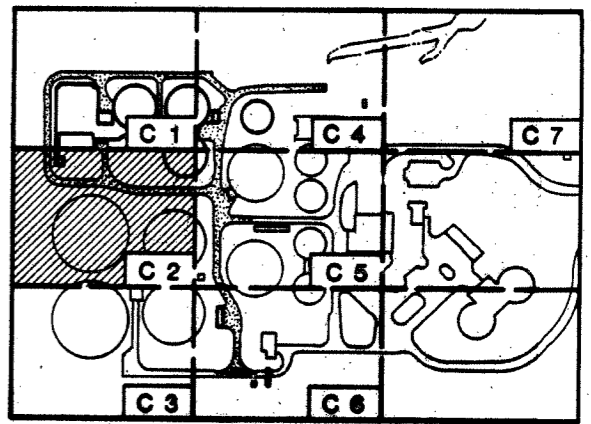
CIVIL **19364**

PAVING AND GRADING PLAN I

DRAWING NUMBER **C1**  
SHEET NUMBER 11 OF 167



- NOTES:
1. SEE GENERAL NOTES ON DRAWING C1.
  2. REMOVE SALVAGE AND STORE EXISTING FENCE. AS SHOWN. REPLACE FOLLOWING COMPLETION OF OTHER WORK IN AREA. PROVIDE TEMPORARY FENCING DURING CONSTRUCTION. TEMPORARY FENCING MATERIAL SHALL MEET WITH CONSTRUCTION MANAGER'S APPROVAL.
  3. PROVIDE CONCRETE MONING STRIP AROUND ALL NEW STRUCTURES EXCEPT WHERE SIDEWALKS OR WALKWAYS ARE ADJACENT TO STRUCTURES. SEE DET. F/C8.



KEY PLAN

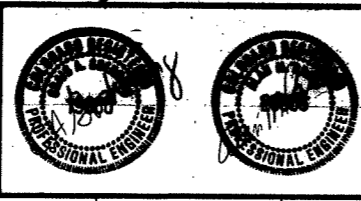
CIVIL 19365

**BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *Alan M. Hart* DATE: 9-87  
 APPROVED: *Alan M. Hart* DATE: 10/87  
 APPROVED: *Alan M. Hart* DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN DAP  
 DESIGNED DAP  
 CHECKED PMP  
 CHECKED

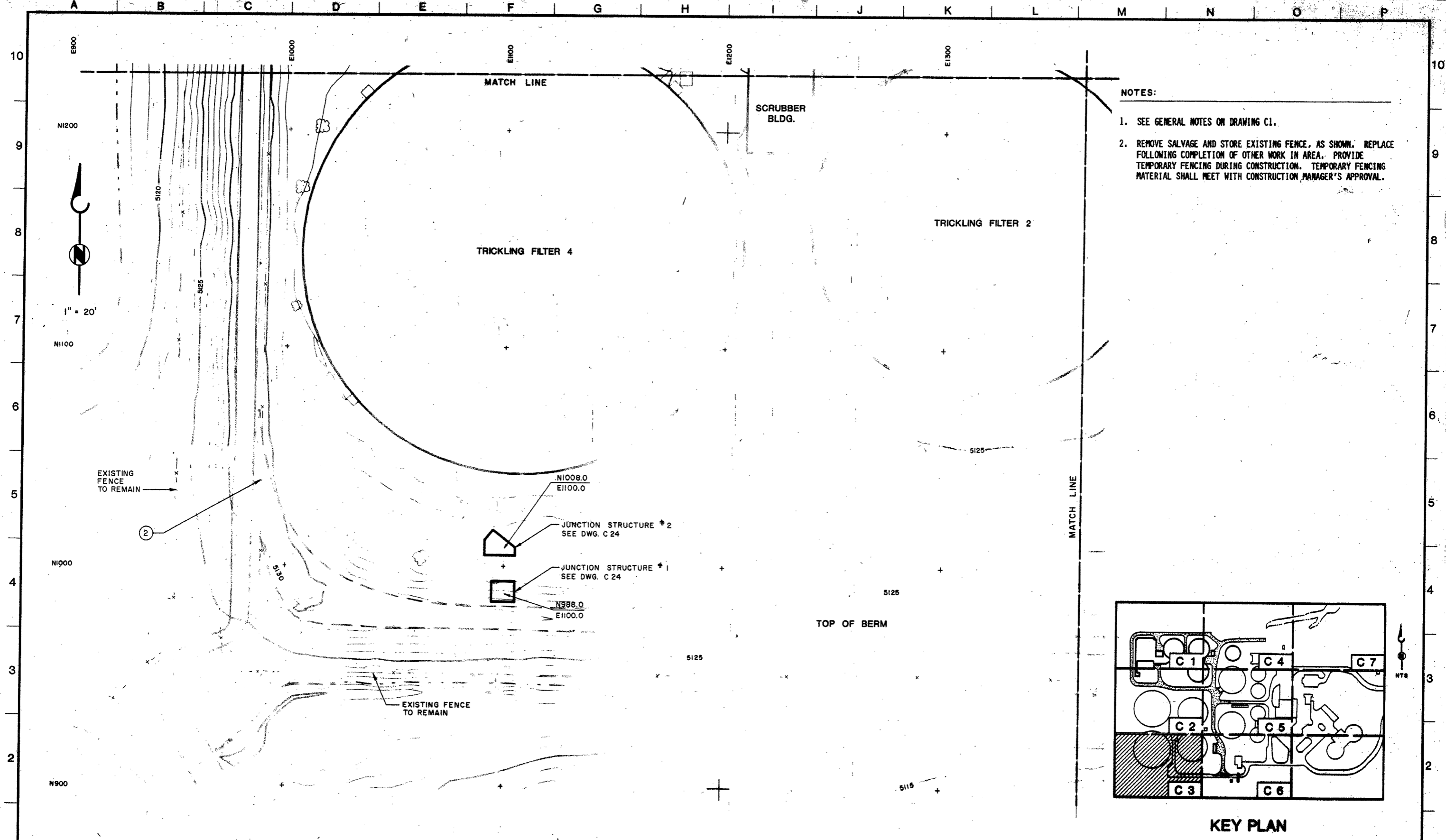


ZONE REV.	DESCRIPTION	BY	DATE	APP.
1	AS-BUILT	JRA	3/90	

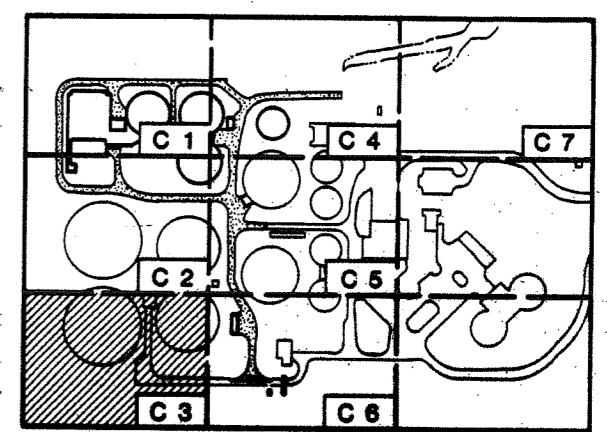
CITY OF BOULDER

75TH STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

DRAWING NUMBER C2  
 SHEET NUMBER 12 OF 167



- NOTES:
1. SEE GENERAL NOTES ON DRAWING C1.
  2. REMOVE SALVAGE AND STORE EXISTING FENCE, AS SHOWN. REPLACE FOLLOWING COMPLETION OF OTHER WORK IN AREA. PROVIDE TEMPORARY FENCING DURING CONSTRUCTION. TEMPORARY FENCING MATERIAL SHALL MEET WITH CONSTRUCTION MANAGER'S APPROVAL.



KEY PLAN

**BC BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *Alan M. Smith* DATE: 9-87  
 APPROVED: *CA Stocking* DATE: 1/87  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 City of Boulder

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)  
 FILE: 3030  
 DRAWN: DAP  
 DESIGNED: DAP  
 CHECKED: PMP  
 CHECKED: \_\_\_\_\_



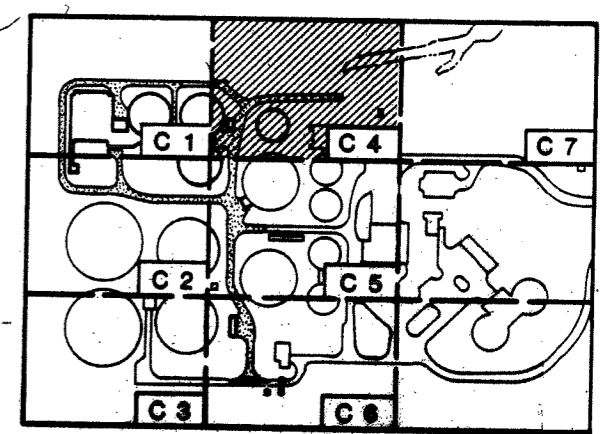
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1	AS-BUILT		JRA	3/90	

CITY OF BOULDER  
 75TH STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

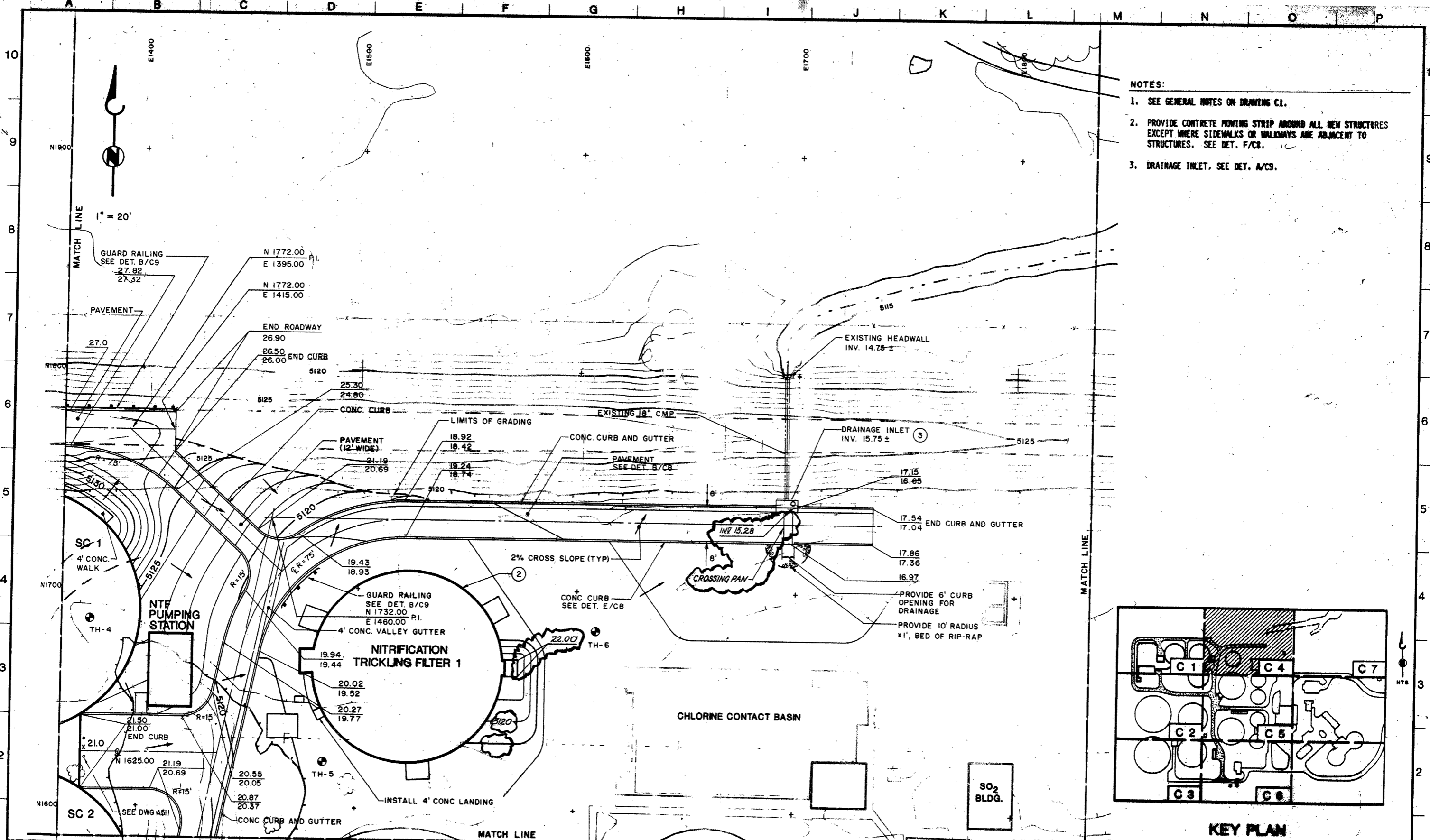
CIVIL **19366**  
 PAVING AND GRADING PLAN 3

DRAWING NUMBER  
**C3**  
 SHEET NUMBER  
 13 OF 167

- NOTES:**
1. SEE GENERAL NOTES ON DRAWING C1.
  2. PROVIDE CONCRETE MOWING STRIP AROUND ALL NEW STRUCTURES EXCEPT WHERE SIDEWALKS OR WALKWAYS ARE ADJACENT TO STRUCTURES. SEE DET. F/C8.
  3. DRAINAGE INLET, SEE DET. A/C9.



**KEY PLAN**



**BC BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *[Signature]* DATE: 9-87  
 APPROVED: *[Signature]* DATE: 1-88  
 APPROVED: *[Signature]* DATE: *[Signature]*

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)  
 FILE 3030  
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 CHECKED AMP  
 CHECKED

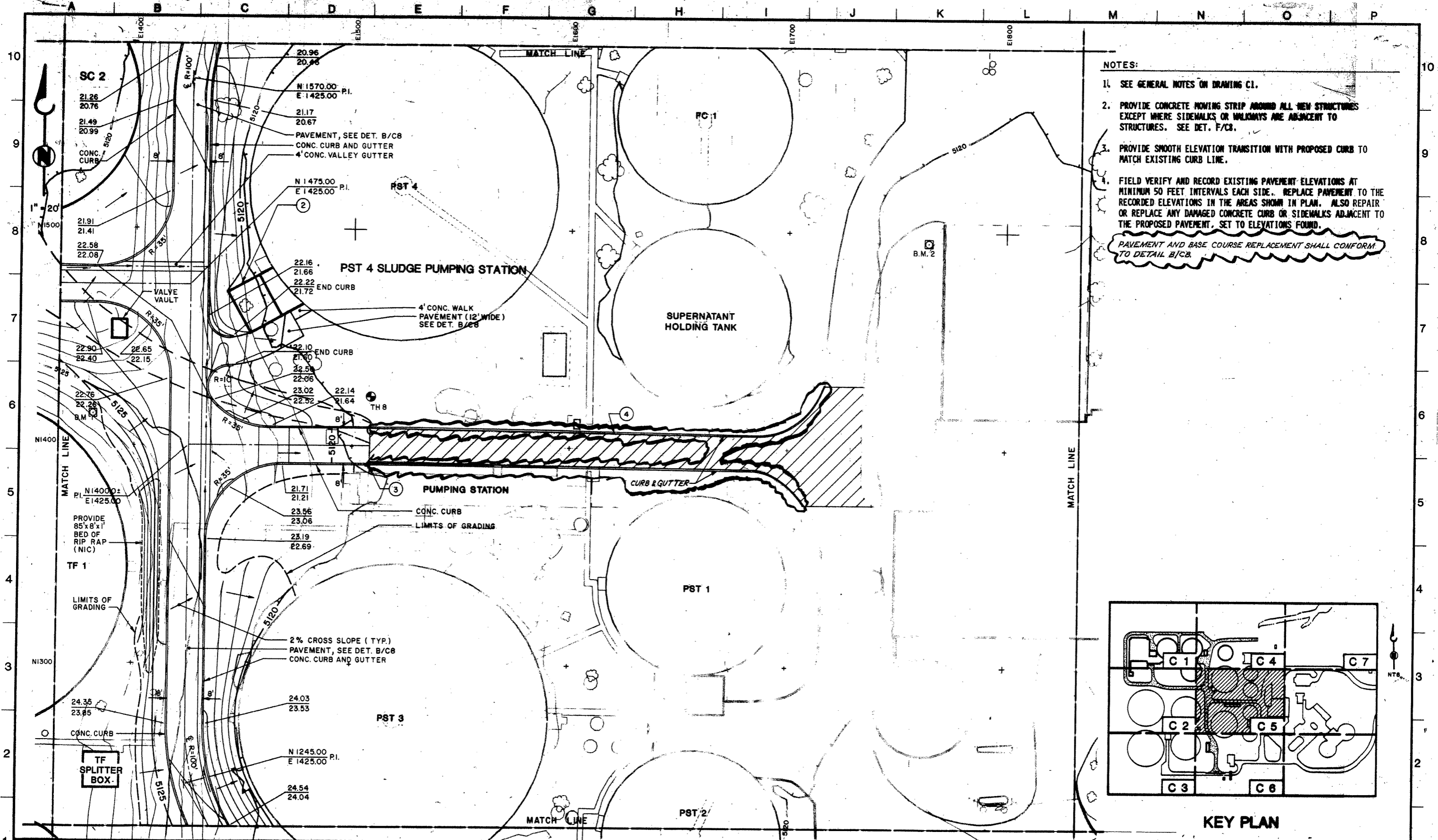


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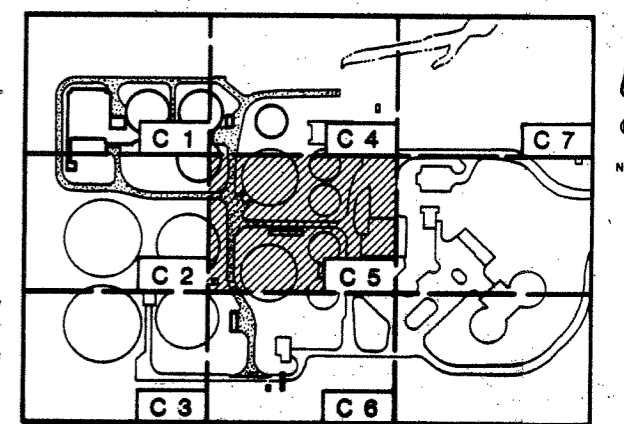
CITY OF BOULDER  
 75TH STREET WASTEWATER TREATMENT PLANT IMPROVEMENTS-PHASE 1A

CIVIL **19367**  
 PAVING AND GRADING PLAN 4

DRAWING NUMBER **C4**  
 SHEET NUMBER 14 OF 167



- NOTES:**
1. SEE GENERAL NOTES ON DRAWING C1.
  2. PROVIDE CONCRETE MOWING STRIP AROUND ALL NEW STRUCTURES EXCEPT WHERE SIDEWALKS OR WALKWAYS ARE ADJACENT TO STRUCTURES. SEE DET. F/C8.
  3. PROVIDE SMOOTH ELEVATION TRANSITION WITH PROPOSED CURB TO MATCH EXISTING CURB LINE.
  4. FIELD VERIFY AND RECORD EXISTING PAVEMENT ELEVATIONS AT MINIMUM 50 FEET INTERVALS EACH SIDE. REPLACE PAVEMENT TO THE RECORDED ELEVATIONS IN THE AREAS SHOWN IN PLAN. ALSO REPAIR OR REPLACE ANY DAMAGED CONCRETE CURB OR SIDEWALKS ADJACENT TO THE PROPOSED PAVEMENT. SET TO ELEVATIONS FOUND.
- PAVEMENT AND BASE COURSE REPLACEMENT SHALL CONFORM TO DETAIL B/C8.*



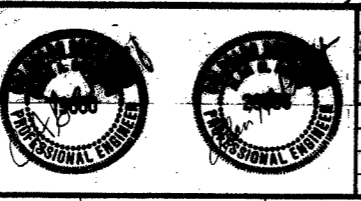
**KEY PLAN**

**BC BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *Alan M. [Signature]* DATE: 9-87  
 APPROVED: *Ch. [Signature]* DATE: 11/87  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN DAP  
 DESIGNED DAP  
 CHECKED PMP  
 CHECKED \_\_\_\_\_



REV.	DESCRIPTION	BY	DATE	APP.
1	AS-BUILT	JRA	3/90	

CITY OF BOULDER

75TH STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

CIVIL **19368**

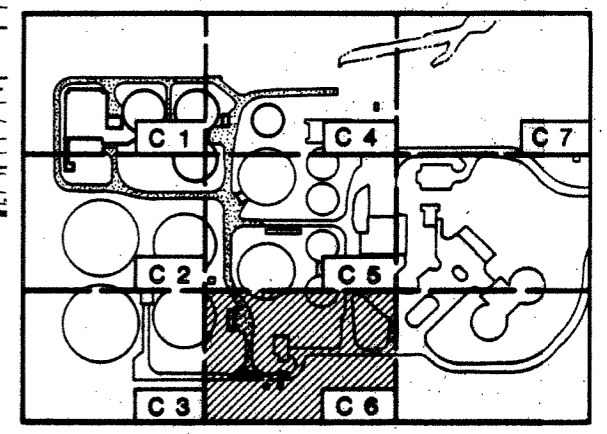
PAVING AND GRADING PLAN 5

DRAWING NUMBER  
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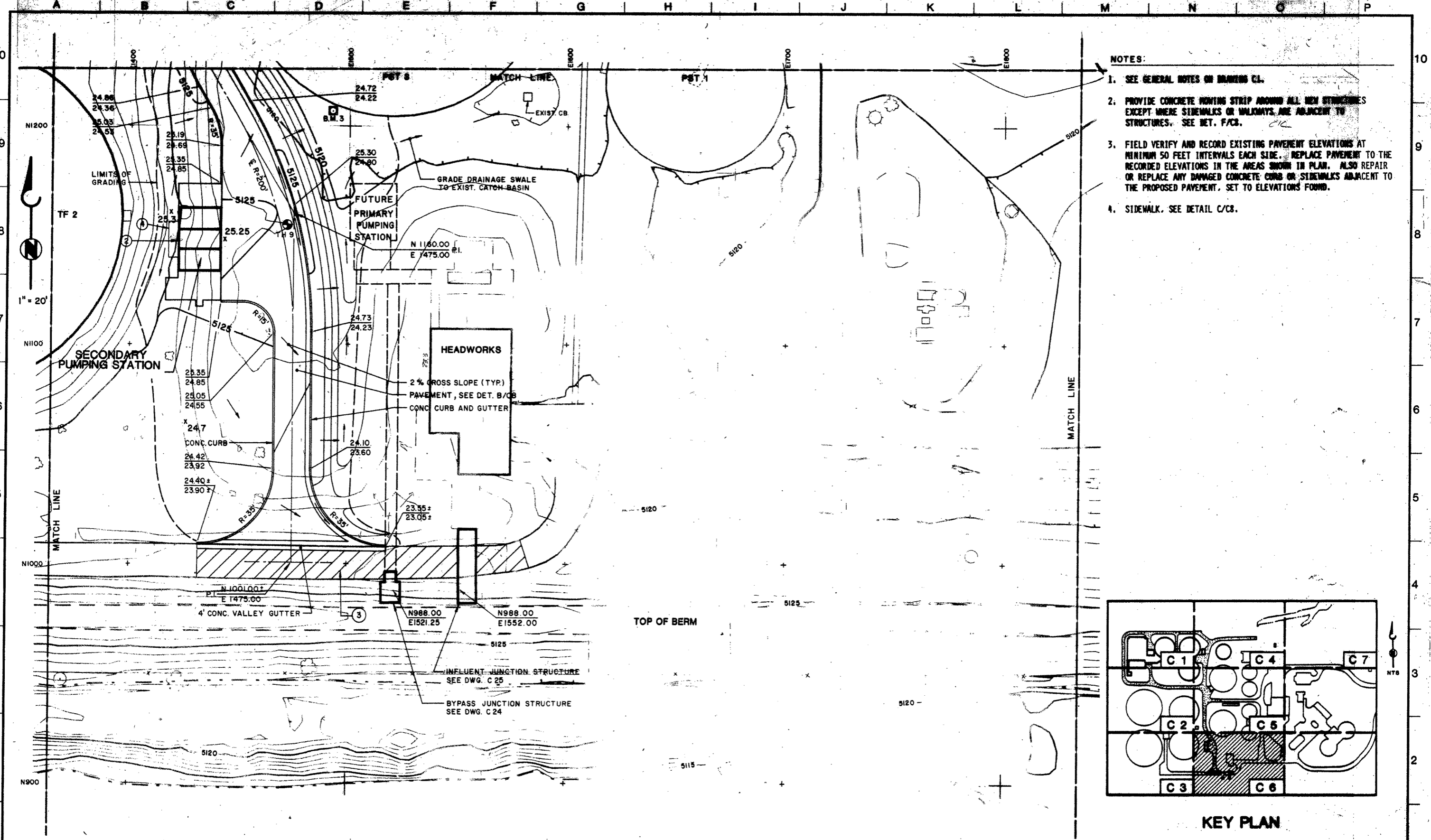
SHEET NUMBER  
15 OF 167



- NOTES:
1. SEE GENERAL NOTES ON DRAWING C1.
  2. PROVIDE CONCRETE MOWING STRIP AROUND ALL NEW STRUCTURES EXCEPT WHERE SIDEWALKS OR WALKWAYS ARE ADJACENT TO STRUCTURES. SEE DET. P/C8.
  3. FIELD VERIFY AND RECORD EXISTING PAVEMENT ELEVATIONS AT MINIMUM 50 FEET INTERVALS EACH SIDE. REPLACE PAVEMENT TO THE RECORDED ELEVATIONS IN THE AREAS SHOWN IN PLAN. ALSO REPAIR OR REPLACE ANY DAMAGED CONCRETE CURB OR SIDEWALKS ADJACENT TO THE PROPOSED PAVEMENT. SET TO ELEVATIONS FOUND.
  4. SIDEWALK. SEE DETAIL C/C8.



KEY PLAN

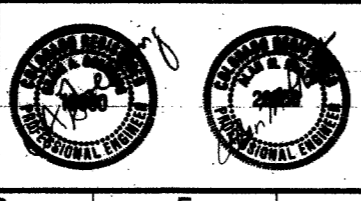


**BROWN AND CALDWELL**  
DENVER, COLORADO

SUBMITTED: *Alan M. Smith* DATE: 9-87  
 APPROVED: *Chas. J. Brown* DATE: 10/87  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)

FILE 3030  
 DRAWN DAP  
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REVISIONS			
ZONE	REV.	DESCRIPTION	BY DATE APP.
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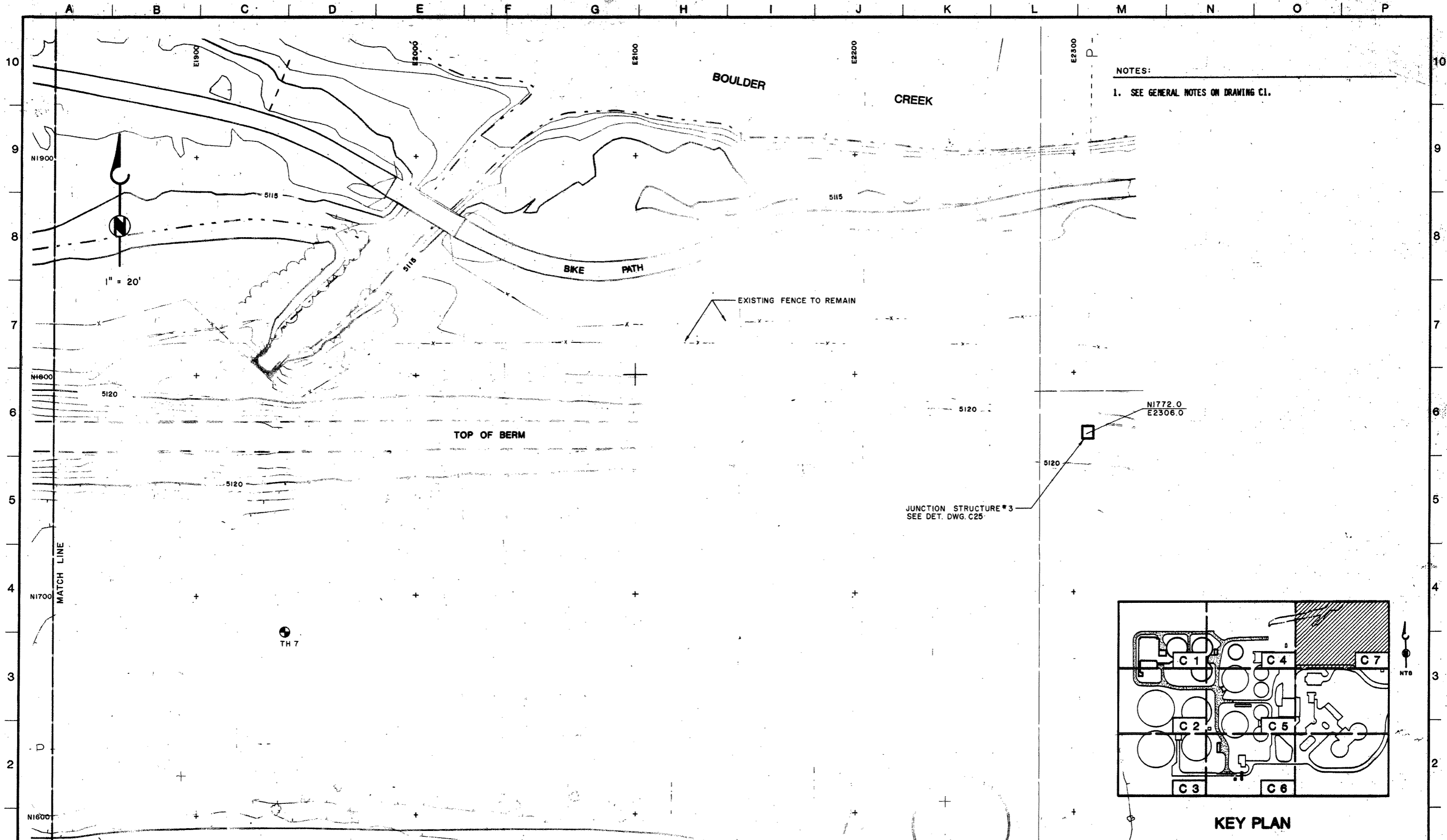
CITY OF BOULDER

75TH STREET  
WASTEWATER TREATMENT PLANT  
IMPROVEMENTS-PHASE 1A

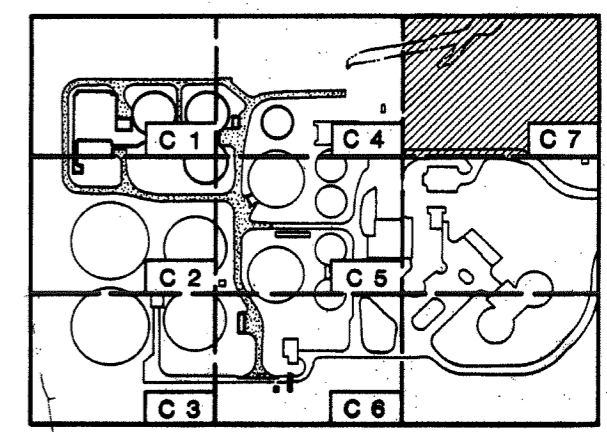
CIVIL **19369**

PAVING AND GRADING PLAN 6

DRAWING NUMBER **C6**  
 SHEET NUMBER 16 OF 167



NOTES:  
 1. SEE GENERAL NOTES ON DRAWING C1.



KEY PLAN

**BROWN AND CALDWELL**  
 DENVER, COLORADO

SUBMITTED: *[Signature]* DATE: 9-87  
 APPROVED: *[Signature]* DATE: 12/87  
 APPROVED: *[Signature]* DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"=SCALE ACCORDINGLY)

FILE 3030  
 DRAWN DAP  
 DESIGNED DAP  
 CHECKED PMP  
 CHECKED \_\_\_\_\_



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	AS-BUILT	JRA	3/90	

CITY OF BOULDER

75TH. STREET  
 WASTEWATER TREATMENT PLANT  
 IMPROVEMENTS-PHASE 1A

CIVIL **19370**

PAVING AND GRADING PLAN 7

DRAWING NUMBER  
**C7**  
 SHEET NUMBER  
 17 OF 167