INNOVATIVE DESIGN. **CLASSIC RESULTS.**

DRAINAGE MEMO FOR GREENWAYS AT SAND CREEK PUD CONCEPT PLAN

September 2019

Prepared for:
ELITE PROPERTIES OF AMERICA, INC.
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Job no. 1195.00

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DRAINAGE MEMO FOR GREENWAYS AT SAND CREEK
PUD CONCEPT PLAN

Engineer's Statement

This report and plan for the drainage design of **Greenways at Sand Creek** PUD Concept Plan was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the City of Colorado Springs Drainage Design and Technical Criteria and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SIGNATURE (Affix Seal):_____

Kyle Campbell, Colorado P.E. No. 29794 Date

Developer's Statement

Elite Properties of America, Inc. hereby certifies that the drainage facilities for **Greenways at Sand Creek** PUD Concept Plan shall be constructed according to the design presented in this report. I understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that are submitted to the City of Colorado Springs pursuant to section 7.7.906 of the City Code; and cannot, on behalf of **Greenways at Sand Creek**, PUD Concept Plan guarantee that final drainage design review will absolve **Elite Properties of America, Inc.** and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

Elite Properties of America, Inc.
Name of Developer

_____
Authorized Signature Date

_____
Printed Name

_____
Title

6385 Corporate Drive, Suite 200
Colorado Springs, CO 80919
Address:

City of Colorado Springs Statement:

Filed in accordance with Section 7.7.906 of the Code of the City of Colorado Springs, 2001, as amended.

_____ _____
For City Engineer Date
Conditions:

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GENERAL DESCRIPTION

The Greenways at Sand Creek PUD Concept Plan reflects a proposed predominantly residential community generally located north of Constitution Avenue (Sand Creek Pond #1) and south of existing North Carefree Circle and east of Tutt Boulevard, existing Springs Ranch residential neighborhoods site along the east boundary.

EXISTING DRAINAGE CONDITIONS

The proposed site currently predominantly drains in a southern direction as sheet flow through the existing Sand Creek golf course. Sand Creek runs through the site in a north-south alignment between existing City of Colorado Springs Sand Creek Pond #2 and Pond #1.

This site sits within the Sand Creek Drainage Basin – Per that DBPS (See Map Excerpt Attached), as well as flood verification and a meeting with City of Colorado Springs stormwater staff, no improvements are required within Sand Creek. The existing installed drainage improvements satisfy the major facility improvement obligations identified in the DBPS.

The overall site was previously studied in the "Springs Ranch Master Development Drainage Plan 2" dated April 1998, by Kiowa Engineering Corporation. The attached two maps are from the approved Master Development Drainage Plan with the proposed PUD Concept Plan boundary indicated.

1. **Exhibit 1:** Hydrologic Sub-basin map Colorado Springs Ranch Master Development Drainage Map Update:

   Exhibit 1 reflects in red the overall parcel boundary of the PUD Concept Plan. Even though adjacent development has taken place since this MDDP was prepared (as well as the Golf Course), drainage patterns of the sub-basins in the Greenways community (24,25,39,40,32,7,6,12,10) remain generally intact.
2. **Exhibit 2:** Existing and Proposed Improvements Colorado Springs Ranch Master Development Drainage Map Update:

   Exhibit 2 reflects the various Sand Creek and adjacent subdivision storm system outfalls required at the time of the MDDP. All required major improvements required in the MDDP have been installed.

Current conditions are generally reflected in the attached "Exhibit 2" drainage map from the same approved Master Development Drainage Plan.

Several storm systems discharge from adjacent developments into the Greenways Community. Some of these are:

1. **Springs Ranch Filing No. 7**

   Discharge from the easterly adjacent residential subdivision will continue into Sand Creek via a proposed public park area.

2. **First and Main Town Center Filing No. 18**

   Two existing storm pipes (15" and 18") discharge across the north portions of this golf course (south on North Carefree).

3. **Springs Ranch Filing No. 9 & 10**

   An Existing 66" public storm pipe discharges into Sand Creek.

4. **Lot 3, Seniors at Springs Ranch**

   Existing private storm outfall and SWQ pond to be accommodated with proposed site design.

5. **Enchanted Springs**

   Existing 30" private storm that crosses the golf course will be accommodated at the time of site Development Plan and Final Plat processing, all existing storm facilitates that affect the Greenways site development will be analyzed in detail to identify if they can be accommodated or possibly relocated.

PROPOSED DRAINAGE CONDITIONS

At this time, no specific land uses are known, nor are any Development Plan or Final Plats proposed to be submitted. Site specific Final Drainage Reports will be required for any development within this PUD Concept Plan area that details full adherence to the City Drainage Criteria Manual, including the use of Full Spectrum Detention. Utilization of Sand Creek Pond #2 for detention or stormwater quality is not proposed to take place. Dependent upon the phasing possibly associated with the next stage of entitlement and amendment to the DBPS may be required. Locations of required stormwater improvement will be detailed in subsequent Final Drainage Reports as development takes place full adherence to City of Colorado Springs drainage criteria will be realized.

FLOODPLAIN STATEMENT

Portions of the PUD Concept Plan site are within a designated F.E.M.A. 100-year floodplain, indicated on Map No. 08041C 0539 G of the Federal Emergency Management Agency's Flood Insurance Rate Map of the City of Colorado Springs, El Paso County, Colorado, prepared by the National Flood Insurance Program, effective December 7, 2018. No development of lots is proposed to take place within the 100-year floodplain.

DRAINAGE AND BRIDGE FEES

This site lies within Sand Creek Drainage Basin. Drainage and or bridge fees will be defined in future Final Drainage Reports.

SUMMARY

In summary, the proposed PUD Concept Plan was previously included in the Springs Ranch Master Development Drainage Plan, and at this time, no changes to the approved general drainage patterns are proposed. Future Final Drainage Reports will detail any possible modifications to proposed drainage patterns/systems once specific land uses are known. This development is proposed to conform with all previously approved reports which reflect this site.

PREPARED BY:

Kyle R. Campbell, P.E.
Division Manager

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REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual, May 2014.

2. Sand Creek Drainage Basin Planning Study, Kiowa Engineering Corporation, Revised March 1996

3. Springs Ranch Master Development Drainage Plan Update, Kiowa Engineering Corporation, Revised April 1998.

APPENDIX

VICINITY MAP

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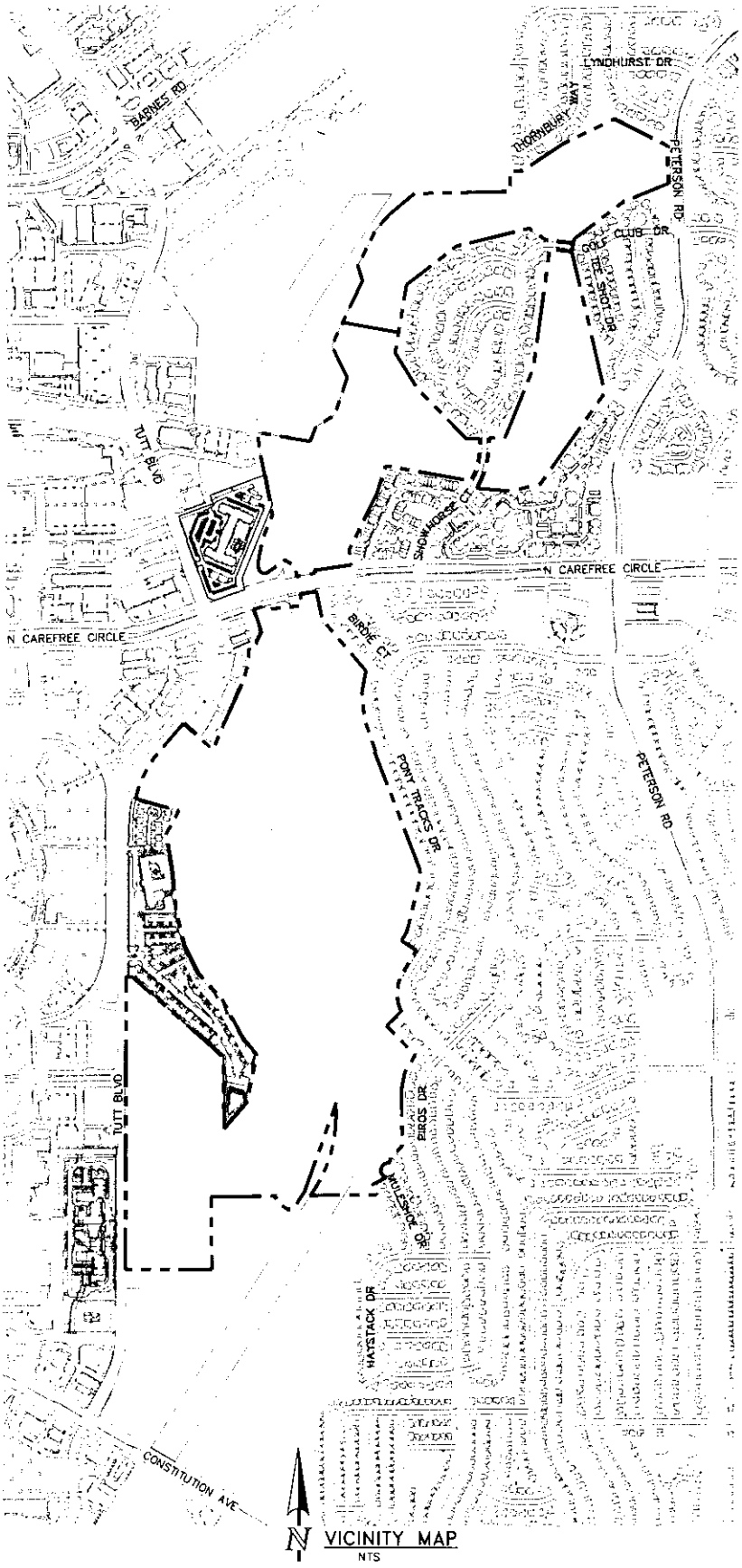

VICINITY MAP
NTS

SOILS MAP (NRCS WEB SOIL SURVEY)

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Soil Map—El Paso County Area, Colorado
(Greenways North)

Map Scale: 1:6,530 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2014—Jun 17, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	10.1	11.8%
97	Truckton sandy loam, 3 to 9 percent slopes	75.8	88.2%
Totals for Area of Interest		**86.0**	**100.0%**

Soil Map—El Paso County Area, Colorado
(Greenways South)

Map Scale: 1:8,080 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
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Water Features
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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2014—Jun 17, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Blendon sandy loam, 0 to 3 percent slopes	99.9	77.4%
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	28.2	21.9%
97	Truckton sandy loam, 3 to 9 percent slopes	1.0	0.7%
Totals for Area of Interest		**129.0**	**100.0%**

El Paso County Area, Colorado

28—Ellicott loamy coarse sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 3680
Elevation: 5,500 to 6,500 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Ellicott and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ellicott

Setting

Landform: Flood plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

A - 0 to 4 inches: loamy coarse sand
C - 4 to 60 inches: stratified coarse sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: Sandy Bottomland LRU's A & B (R069XY031CO)
Other vegetative classification: SANDY BOTTOMLAND (069AY031CO)
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquoll
Percent of map unit:
Landform: Swales
Hydric soil rating: Yes

Other soils
Percent of map unit:
Hydric soil rating: No

Pleasant
Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

El Paso County Area, Colorado

97—Truckton sandy loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2x0j2
Elevation: 5,300 to 6,850 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 85 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Truckton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Interfluves, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Re-worked alluvium derived from arkose

Typical profile

A - 0 to 4 inches: sandy loam
Bt1 - 4 to 12 inches: sandy loam
Bt2 - 12 to 19 inches: sandy loam
C - 19 to 80 inches: sandy loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline (0.1 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A

Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Blakeland

Percent of map unit: 8 percent
Landform: Interfluves, hillslopes
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Bresser

Percent of map unit: 7 percent
Landform: Interfluves, low hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

El Paso County Area, Colorado

10—Blendon sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 3671
Elevation: 6,000 to 6,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blendon and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blendon

Setting

Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

A - 0 to 10 inches: sandy loam
Bw - 10 to 36 inches: sandy loam
C - 36 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

F.E.M.A. FLOODPLAIN MAP

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NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

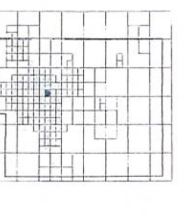
Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

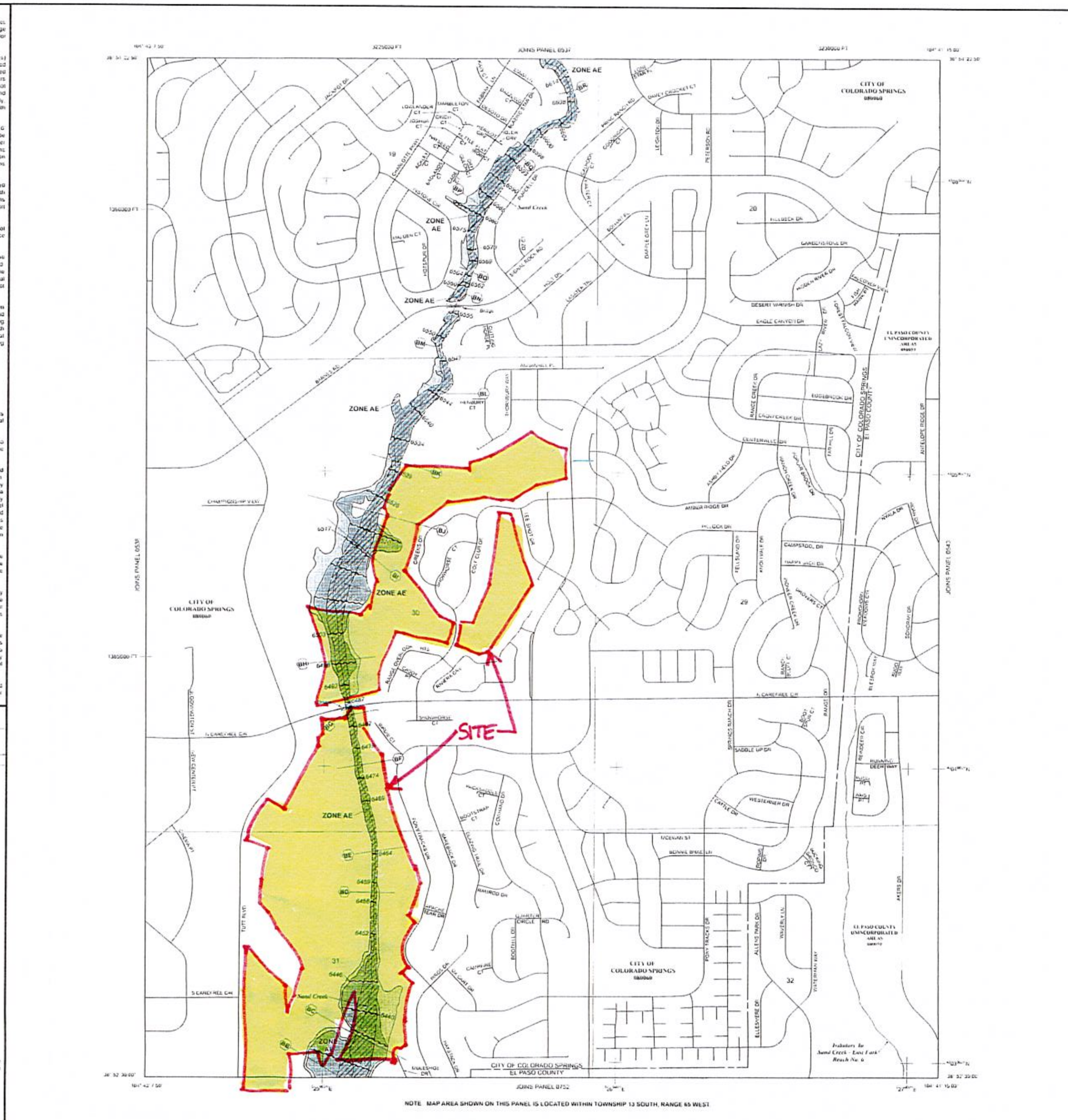
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 65 WEST

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- ~~ 513 ~~ Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- (A)——(A) Cross section line
- (23)------(23) Transect line
- 97° 07' 30.00", 32° 22' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 FT 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0539G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 539 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	[illegible]	[illegible]	G
EL PASO COUNTY	[illegible]	[illegible]	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

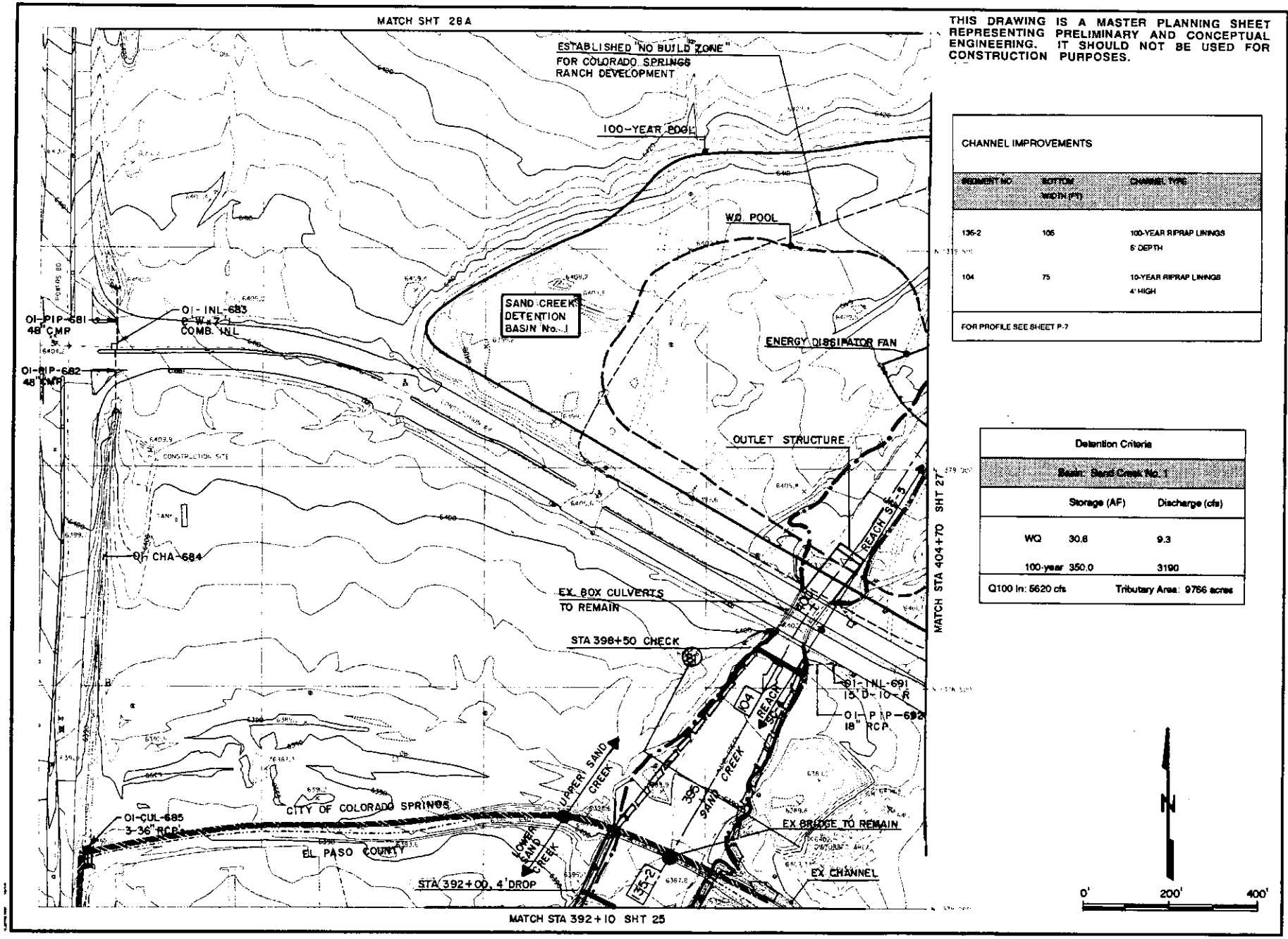
MAP NUMBER 08041C0539G

MAP REVISED DECEMBER 7, 2018

Federal Emergency Management Agency

SAND CREEK DBPS MAPS

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS



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

CHANNEL IMPROVEMENTS

SEGMENT NO.	BOTTOM WIDTH (FT)	CHANNEL TYPE
135-2	105	100-YEAR RIPRAP LININGS 5' DEPTH
104	75	10-YEAR RIPRAP LININGS 4' HIGH

FOR PROFILE SEE SHEET P-7

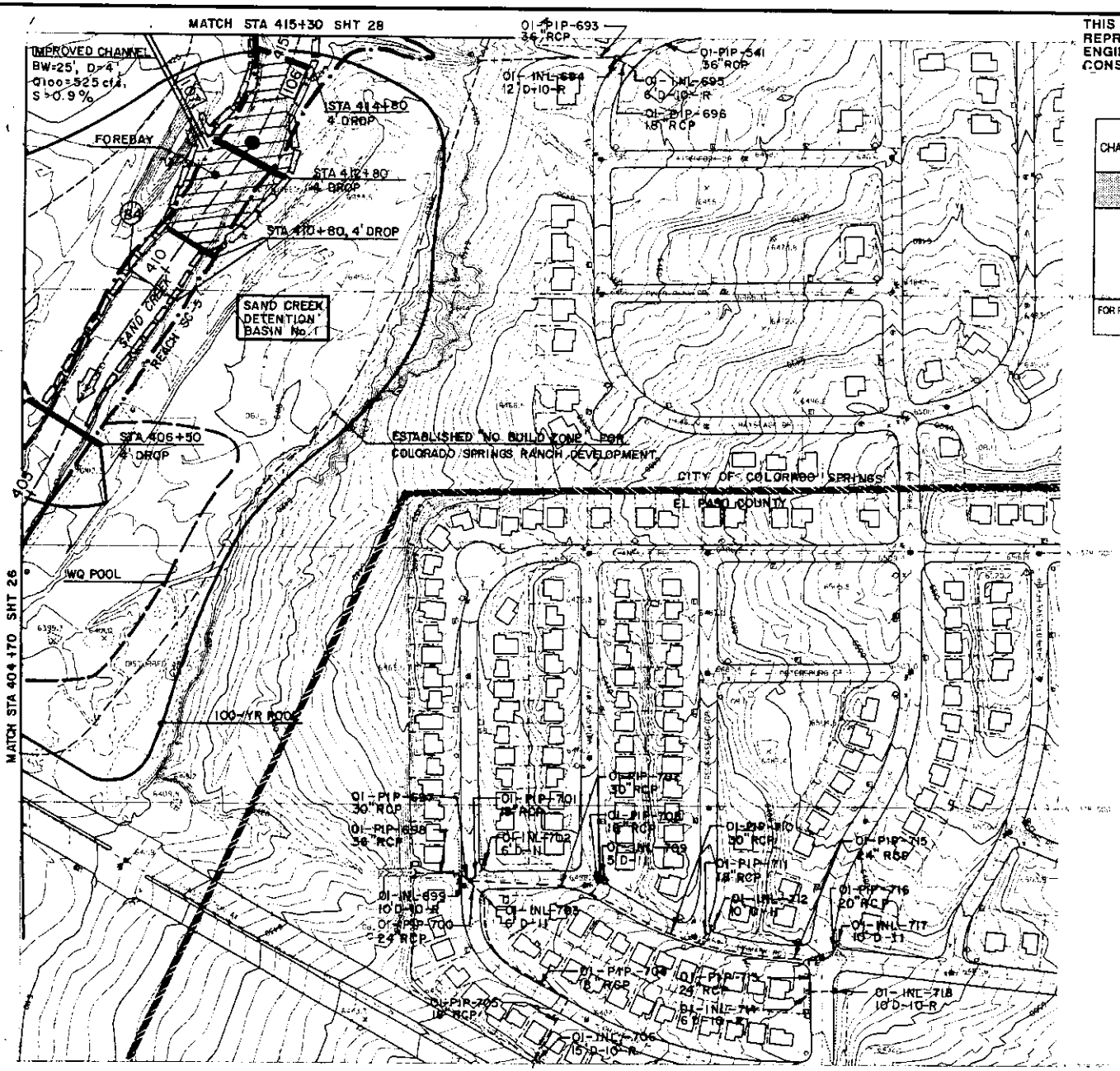
Detention Criteria

Basin: Sand Creek No. 1	Storage (AF)	Discharge (cfs)
WQ	30.8	9.3
100-year	350.0	3190
Q100 In: 5620 cfs	Tributary Area: 9766 acres	

Kiowa Engineering Corporation
419 W. Bijou Street
Colorado Springs, Colorado
80905-1308

SAND CREEK DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN PLANS

Project No.	90-04-09
Date:	9-92
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	



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CHANNEL IMPROVEMENTS

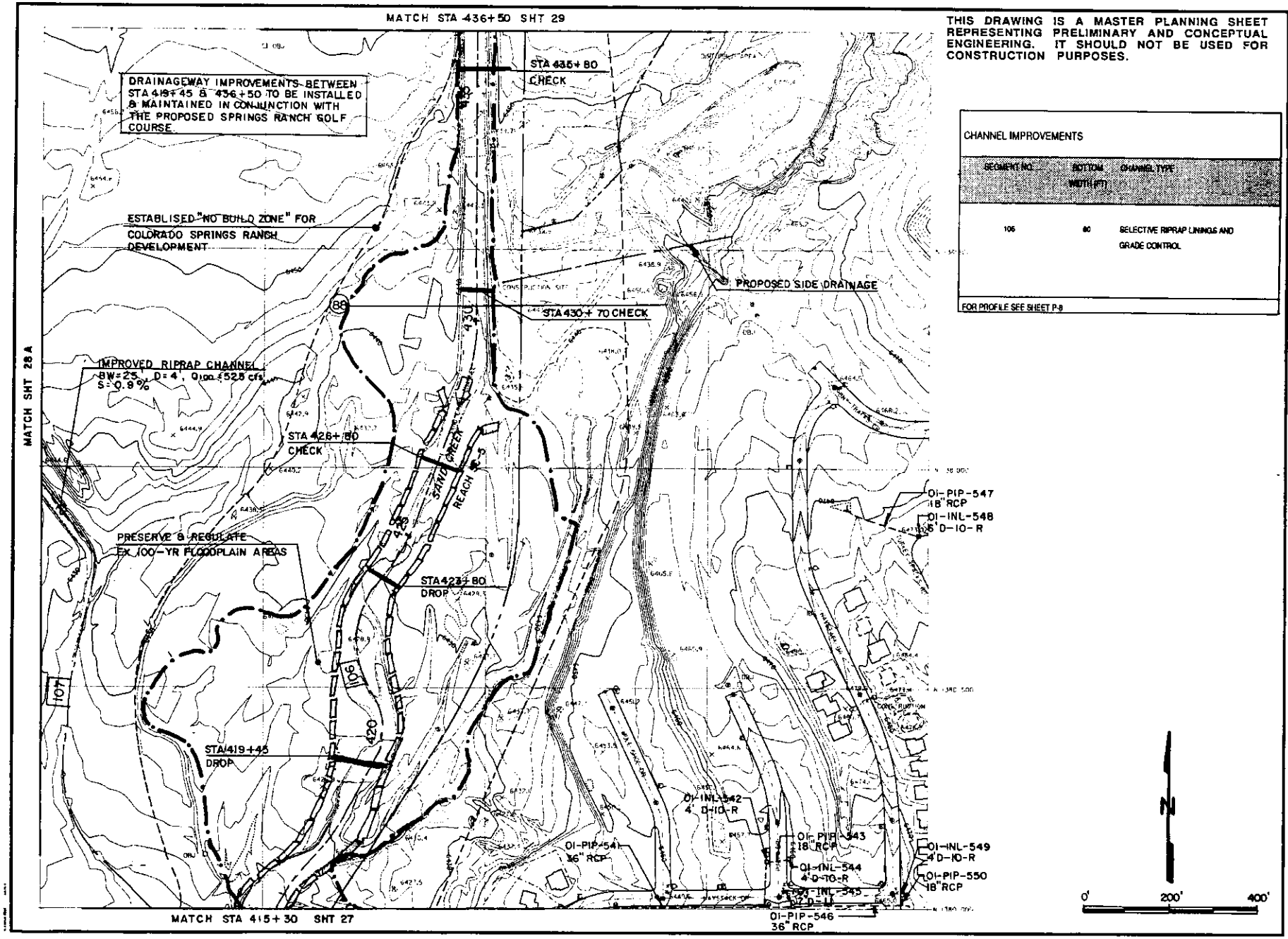
SEGMENT NO.	BOTTOM WIDTH (FT)	CHANNEL TYPE
106	80	SELECTIVE RIPRAP LININGS AND GRADE CONTROL

FOR PROFILE SEE SHEETS P-7, AND P-8

Kiowa Engineering Corporation
419 W. Bijou Street
Colorado Springs, Colorado
80905-1308

SAND CREEK DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN PLANS

Project No.	80-04-02
Date:	9-92
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	



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CHANNEL IMPROVEMENTS

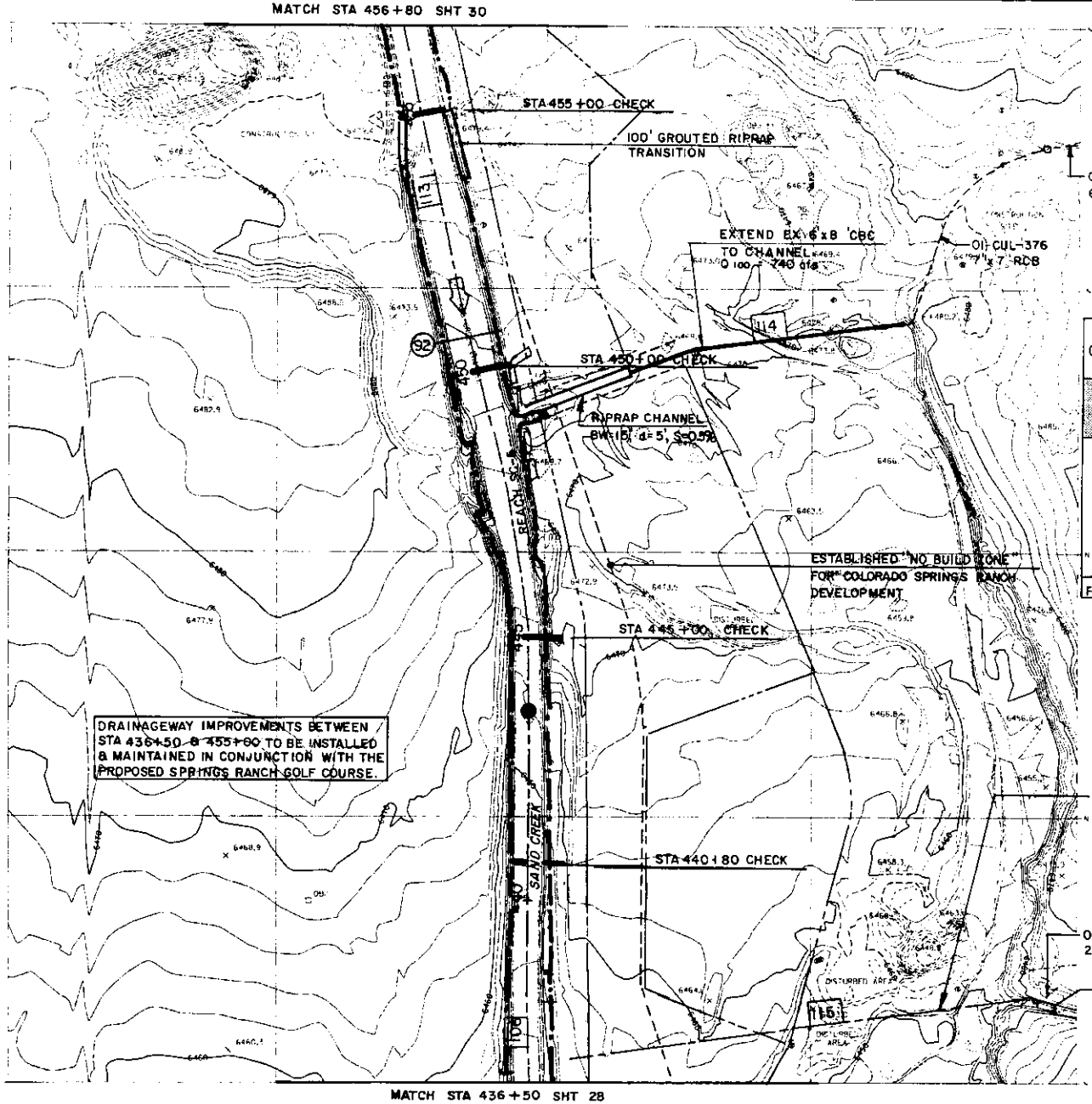
SEGMENT NO.	BOTTOM WIDTH (FT)	CHANNEL TYPE
106	80	SELECTIVE RIPRAP LININGS AND GRADE CONTROL

FOR PROFILE SEE SHEET P-8

Kiowa Engineering Corporation
419 W. Bijou Street
Colorado Springs, Colorado
80905-1308

SAND CREEK DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN PLANS

Project No	90-04-09
Date:	8-92
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	



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

CHANNEL IMPROVEMENTS

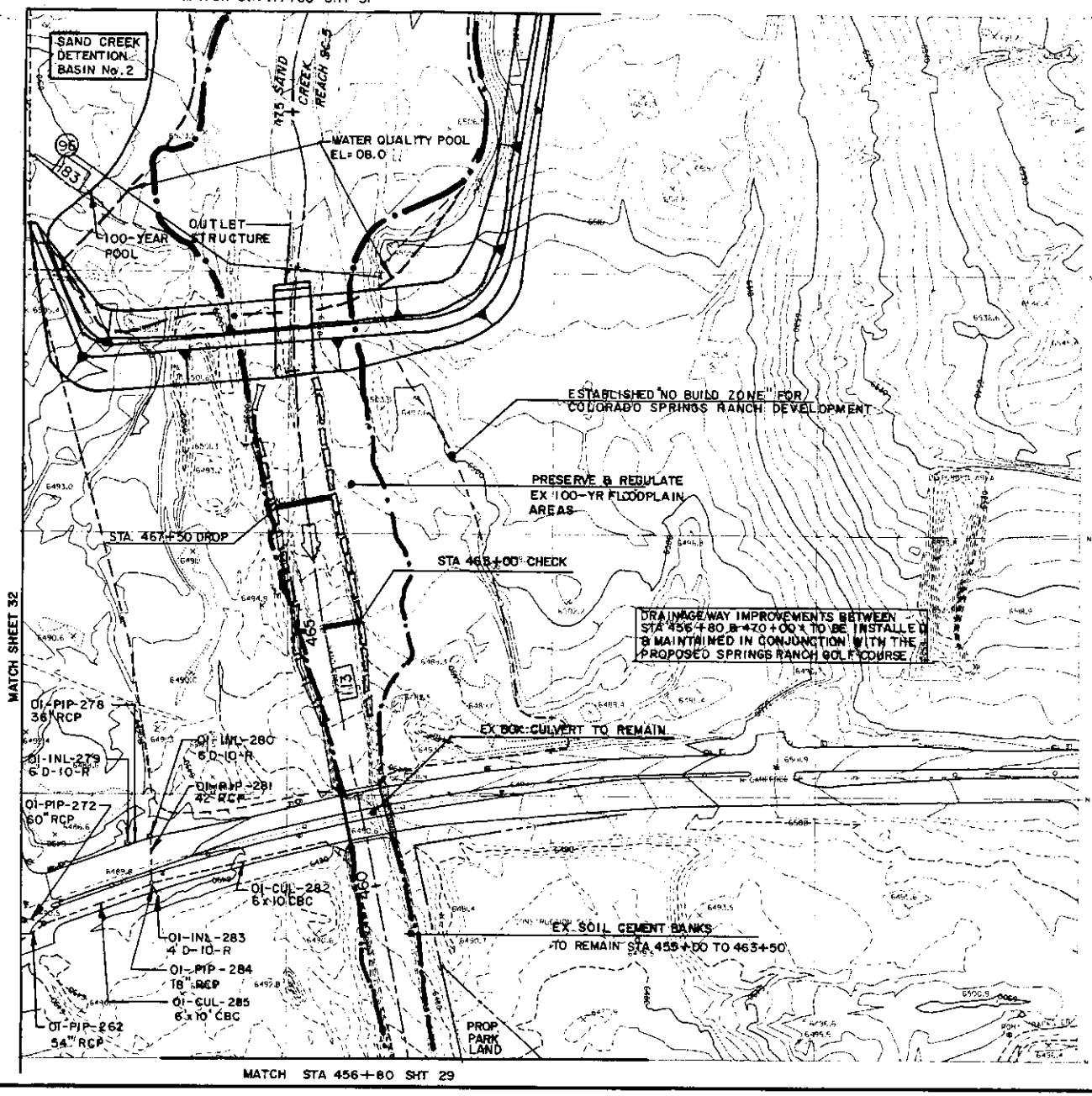
SEGMENT NO.	BOTTOM WIDTH (FT)	CHANNEL TYPE
113	60	SELECTIVE RIPRAP LININGS 4' HIGH

FOR PROFILE SEE SHEET P-8

Kiowa Engineering Corporation
419 W. Bijou Street
Colorado Springs, Colorado
80905-1308

SAND CREEK DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN PLANS

Project No. 92-04-09
Date: 5-99
Design: RNW
Drawn: EAK
Check: RNW
Revisions:



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

CHANNEL IMPROVEMENTS

SEGMENT NO.	BOTTOM WIDTH (FT)	CHANNEL TYPE
113	80	SELECTIVE RIPRAP LININGS AND GRADE CONTROL

FOR PROFILE SEE SHEETS P-8 AND P-9

Detention Criteria

Detention Basin: Sand Creek No. 2		
	Storage (AF)	Discharge (cfs)
WQ	60.3	18.2
100-year	230	4670
Q100 In: 8540 cfs		Tributary Area: 8645 acres

Kiowa Engineering Corporation
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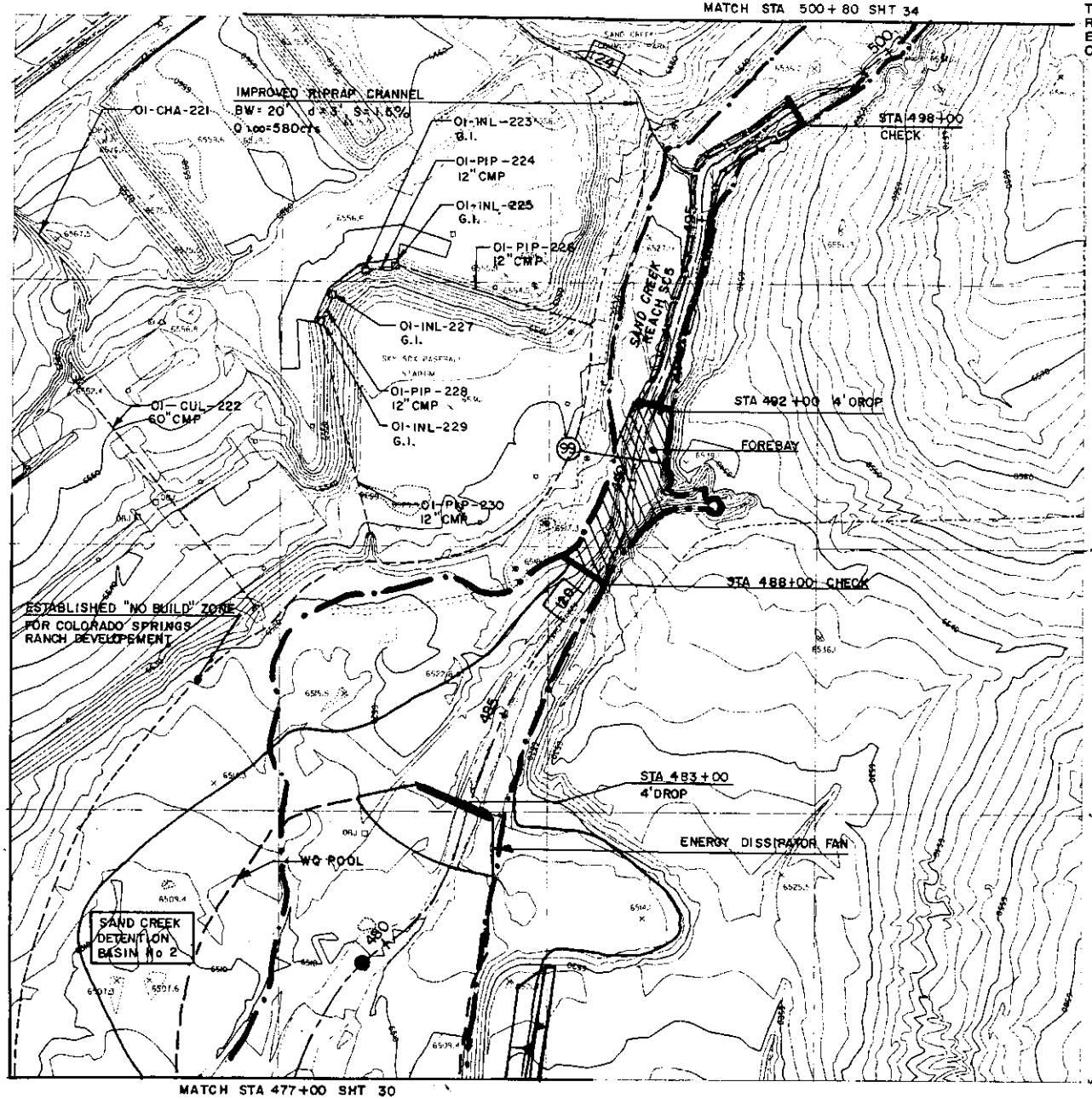
80905-1308

SAND CREEK DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN PLANS

Project No.	90-04.09
Date:	9-92
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	



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CHANNEL IMPROVEMENTS		
SEGMENT NO.	BOTTOM WIDTH (FT)	CHANNEL TYPE
120	N/A	SELECTIVE RIPRAP LININGS AND GRADE CONTROL & 10-YEAR RIPRAP BANK LININGS
FOR PROFILE SEE SHEET P-9		

Detention Criteria		
Detention Basin: Sand Creek No. 2		
	Storage (AF)	Discharge (cfs)
WQ	60.3	18.2
100-year	230	4670
Q100 In: 8540 cfs		Tributary Area: 8646 acres

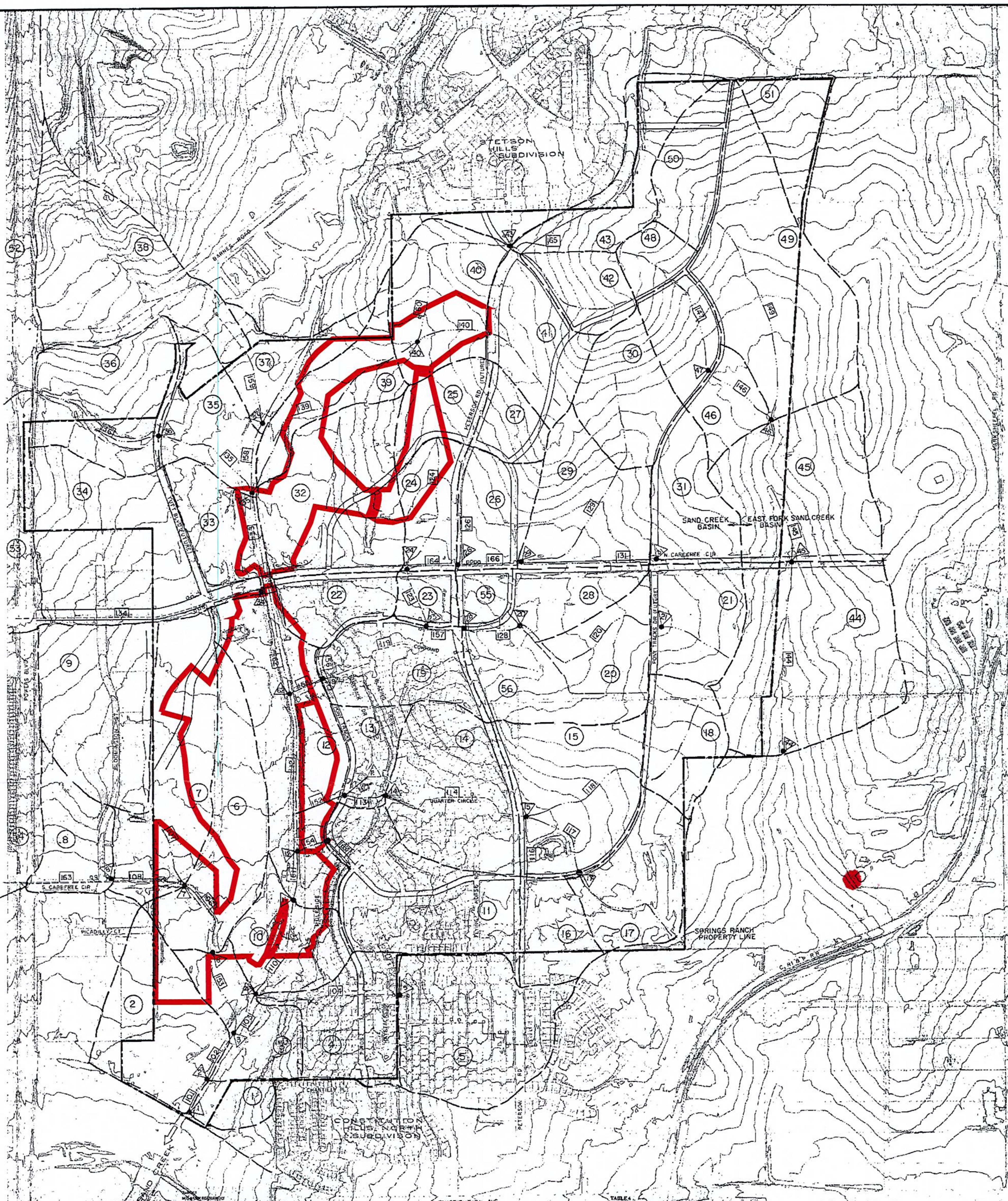
Kiowa Engineering Corporation
419 W. Bijou Street
Colorado Springs, Colorado
80905-1308

SAND CREEK DRAINAGE BASIN PLANNING STUDY
PRELIMINARY DESIGN PLANS

Project No	90-04-09
Date:	9-92
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	

MDDP DRAINAGE MAPS

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS



LEGEND

- BASIN BOUNDARY
- DESIGN POINT
- (15) SUB-BASIN
- DRAINAGE WAY
- REACH NO.

N

0' 200' 400' 600' 800' 1,000'

TABLE 5
SUB-BASIN DISCHARGES
SPRINGS RANCH DEVELOPMENT MDDP UPDATE

SUB BASIN #	DRAINAGE AREA (SM)	DISCHARGE/FREQUENCY (CFS)(1)			
		10YR EX	10YR FUT	100YR EX	100YR FUT

(1) ALL DISCHARGES ARE FOR THE 24-HOUR DURATION RAINFALL

TABLE 4
DESIGN POINT DISCHARGES
SPRINGS RANCH DEVELOPMENT MDDP UPDATE

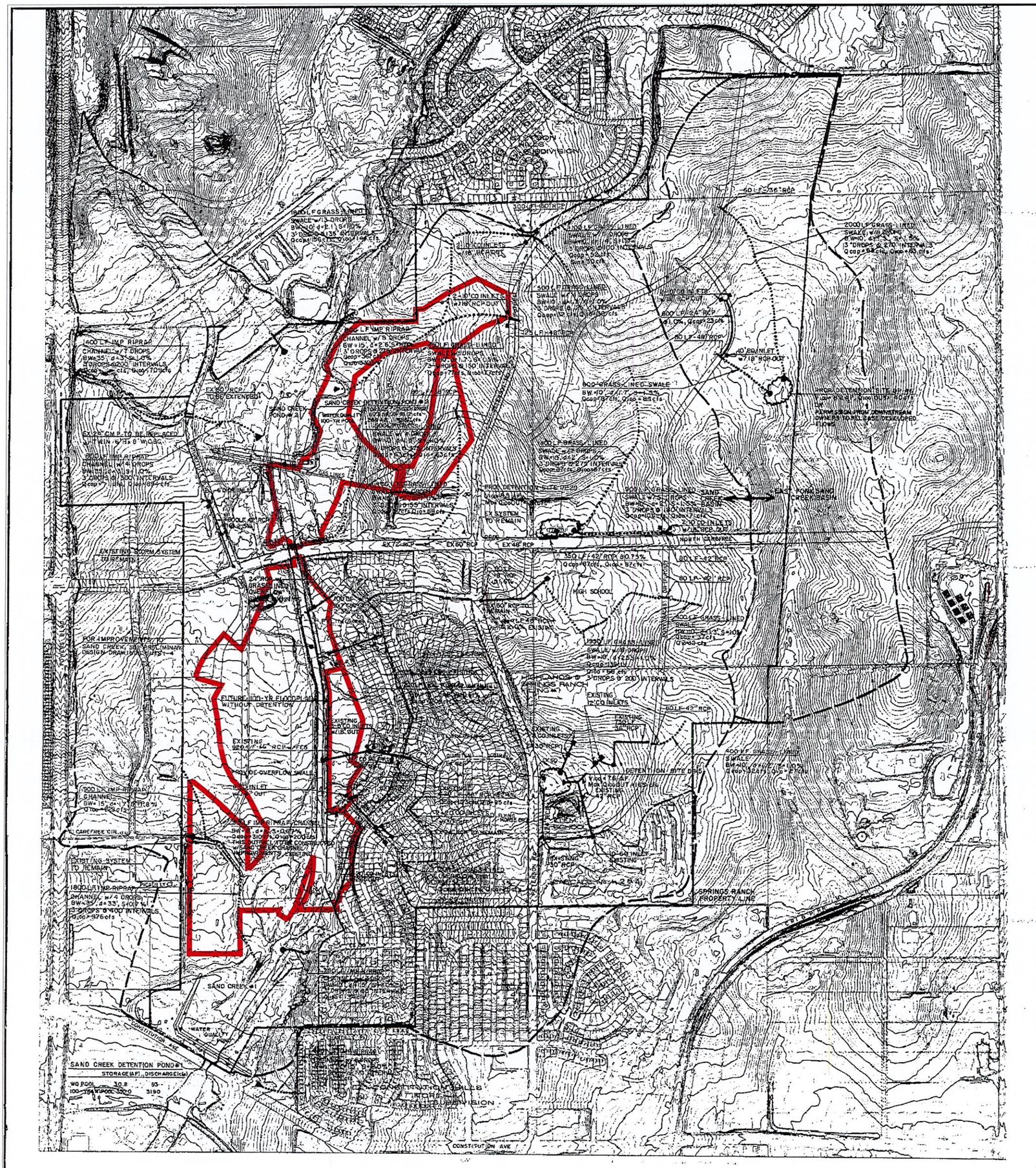
DESIGN POINT #	DISCHARGE/FREQUENCY (CFS) (1)				
	10YR EX	10YR FUT	100YR EX	100YR FUT	
5	62	62	135	135	
6	250	490	520	930	
7	254	450	540	850	
8	200	180	440	540	
13	60	250	130	470	
14	75	140	230	240	
15	34	200	170	390	
15	54	115	140	165	
17	25	65	75	115	
19	79	370	390	840	
20		73		175	
23	75	340	260	740	
24	63	229	210	460	
26	47	35	140	100	
28	11	139	41	250	
29	56	150	115	350	
31	15	37	39	73	
36	280	500	610	900	
37	83	200	185	330	
40	48	140	120	250	
43	17	60	51	115	
44	75	282	273	647	
45	63	225	215	494	
46	52	166	166	390	
47	13	43	41	85	
SAND CREEK @ N PROPERTY LINE	1100	4160	3670	9280	(2)
SAND CREEK D/S N. CAREFREE CIR.	1660	4590	4470	10500	(2)
SAND CREEK D/S CONSTITUTION	1930	5400	5040	12100	(2)

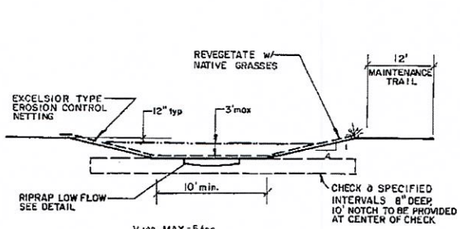
NOTES:

1. ALL DISCHARGES ARE FOR THE 24-HOUR DURATION RAINFALL.
2. DISCHARGES FOR SAND CREEK WERE OBTAINED FROM THE SAND CREEK DRAINAGE BASIN PLANNING STUDY, OCTOBER, 1996.

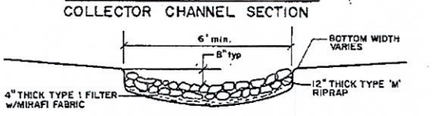
EXHIBIT 1

HYDROLOGIC SUB-BASIN MAP
COLORADO SPRINGS RANCH
MASTER DEVELOPMENT DRAINAGE PLAN UPDATE

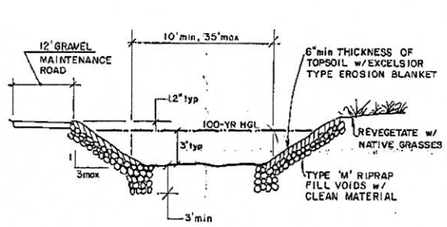




TYPICAL GRASS-LINED
COLLECTOR CHANNEL SECTION



RIPRAP LOW FLOW



TYPICAL RIPRAP LINED
COLLECTOR CHANNEL

LEGEND

- GRASS-LINED OR RIPRAP COLLECTOR CHANNEL w/ OUTLET STRUCTURE
- BASIN DIVIDE
- LOCAL DETENTION BASIN

EXHIBIT 2

EXISTING AND PROPOSED IMPROVEMENTS
COLORADO SPRINGS RANCH
MASTER DEVELOPMENT DRAINAGE PLAN UPDATE