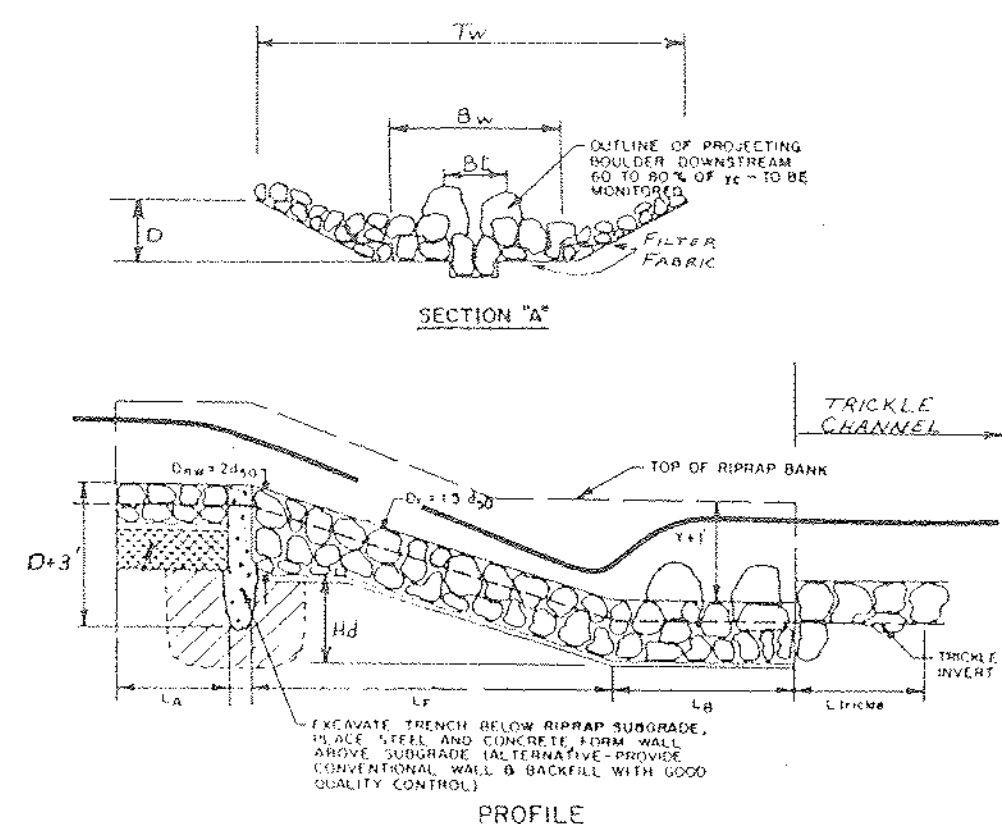


# SKYWAY HEIGHTS EROSION CONTROL DETAILS



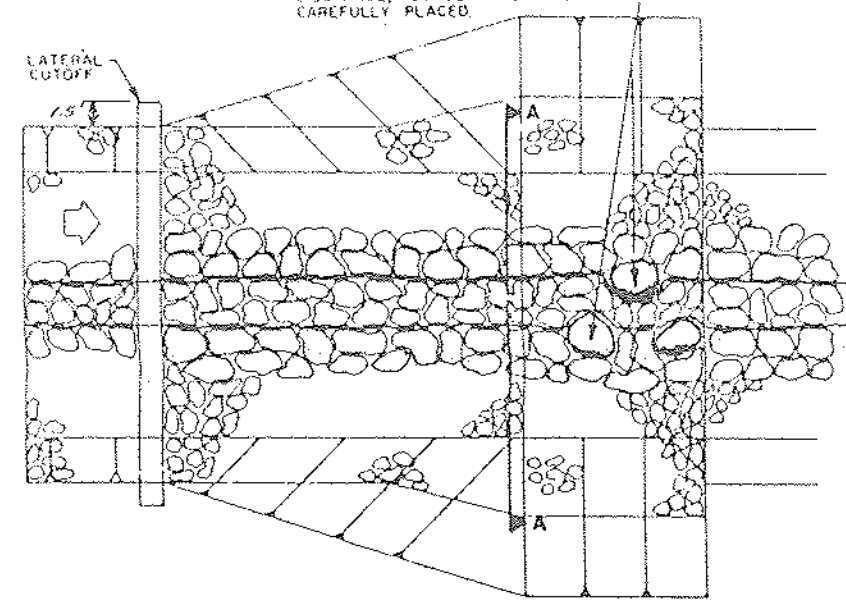
DP2.5 - DP2.6 GRADE CONTROL STRUCTURE

Damage Number: 2  
 G100: 47  
 Drop Amount: 8.0  
 Drop Slope: 0.15

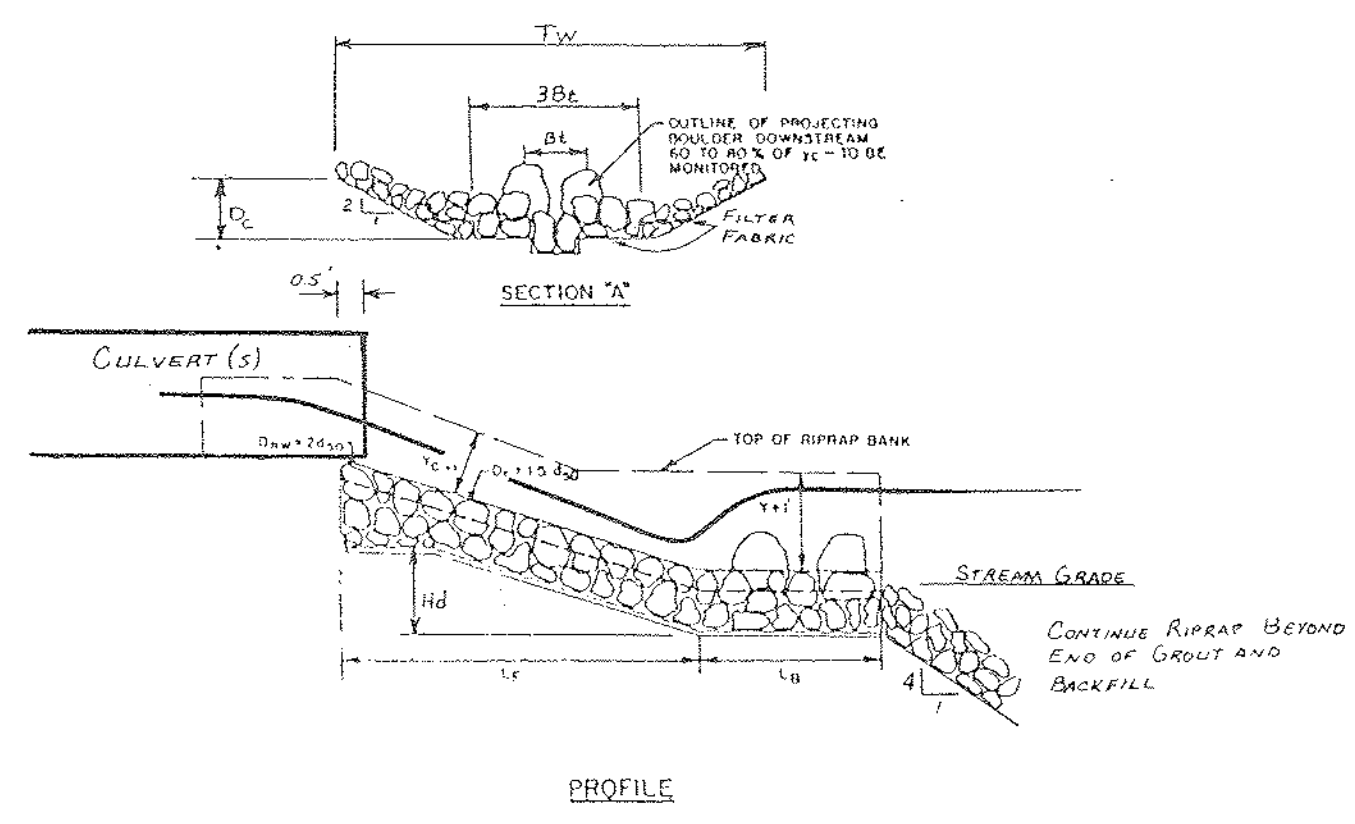
Geometry  
 Length (ft): 40.00  
 Approach Length (ft): 10  
 Runout Length (ft): 10  
 Bottom Width (ft) Bot: 30  
 Side Slope (ft): 1:1  
 Manning's n: 0.04  
 Slope (ft): 0.15  
 Water Depth (ft): 0.90  
 Freeboard (ft): 1.14  
 Total Channel Depth: 2.04  
 Channel Topwidth: 18.54  
 Feet of Drop: 14  
 Grout Thickness: 1.5

Riprap Sizing  
 SDO=10" Size 60  
 DRDO=5" 4  
 Riprap Type: SDO  
 Riprap D50 (in): 5  
 Riprap Depth (ft): 1.13

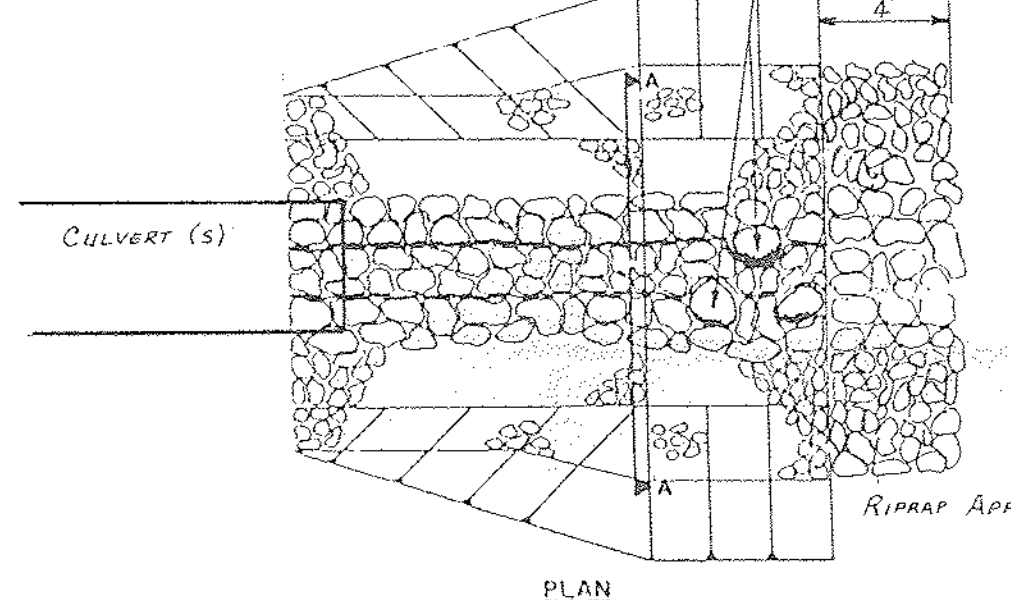
Hydraulics  
 Discharge (ft³/s): 47.66  
 Velocity (ft/s): 5.67  
 Froude Number: 1.18  
 Area (ft²): 8.41  
 Wetted Perimeter (ft): 12.01  
 Hydraulic Radius: 0.70  
 Top Width - Water Surface: 11.70



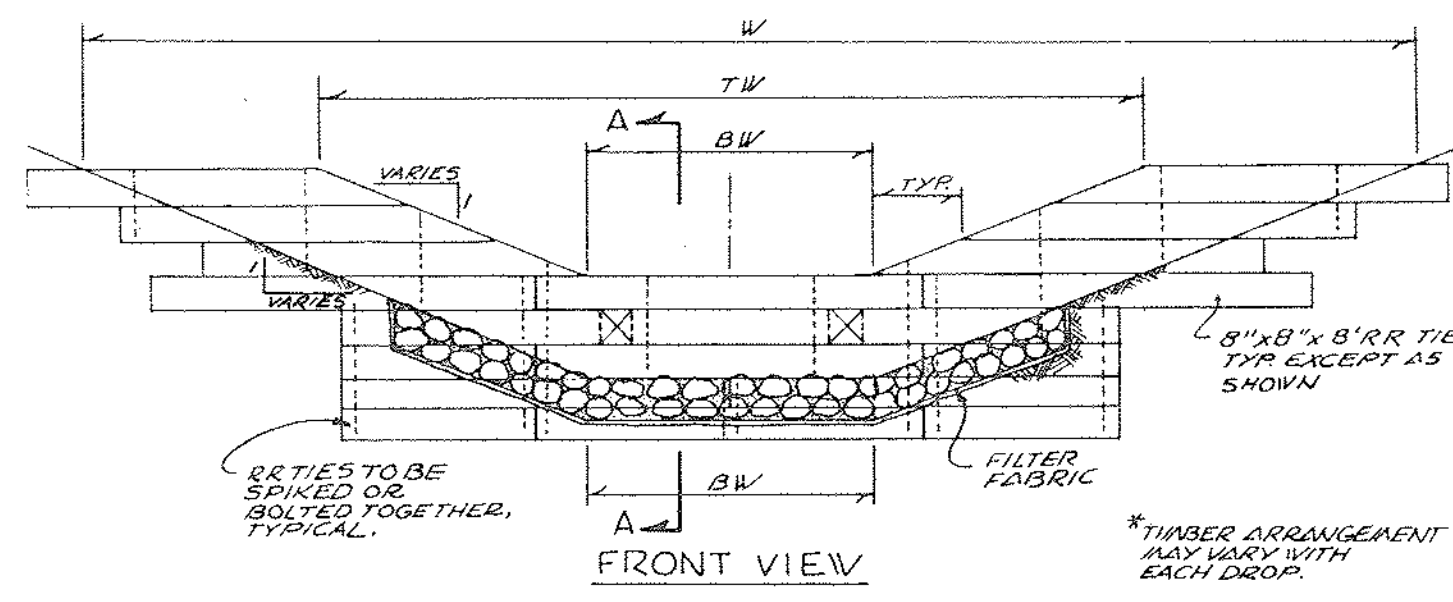
DETAIL 1



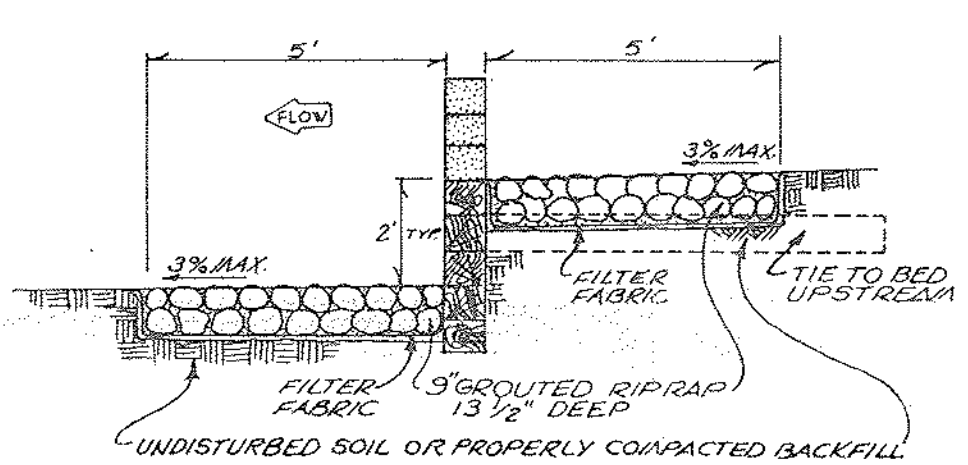
PROFILE



DETAIL 2



FRONT VIEW



SECTION A-A

WOODEN DROP

DETAIL 3

Pond Inlet Structures

Channel Dimensions	Pond 1		Pond 2		Pond 3		Pond 4		Pond 5		Pond 6		Pond 7		Pond 8		Pond 9		Pond 10	
	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel
Length (ft)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Approach Length (ft)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bottom Width (ft)	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00	8.00	1.00
Side Slope (ft)	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
Manning's n	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Slope (ft)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Water Depth (ft)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Freeboard (ft)	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Total Channel Depth (ft)	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Channel Topwidth (ft)	20.00	9.00	18.74	8.81	18.64	8.78	18.58	8.74	18.52	8.69	18.42	8.64	18.34	8.59	18.22	8.54	18.10	8.49	18.02	8.45
Area (ft²)	29.7	8.1	27.1	7.6	26.8	7.3	26.9	7.0	26.7	6.7	26.1	6.5	25.3	6.4	24.7	6.3	24.1	6.2	23.5	6.1
Feet of Drop	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Total Drop	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25

CULVERT OUTLET STRUCTURES

Outlet	C1	C2	C3	C4	C5	C6	C7	C8	C9
Number of Poles	1	1	2	2	2	2	2	2	2
Drop Amount (ft)	3.5	1.5	1.5	2	1.5	3.5	2	2	5
Drop Slope (ft)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Drop Rate (ft)	0.3	0.1	0.3	0.7	0.1	1.2	0.7	0.7	1.2
Drop Rate (ft)	4.0	6.0	2.5	3.7	5.0	5.0	3.0	3.0	7.0
Drop Rate (ft)	0.16	0.24	0.10	0.17	0.20	0.20	0.15	0.15	0.28

WOODEN LOW DROP STRUCTURES

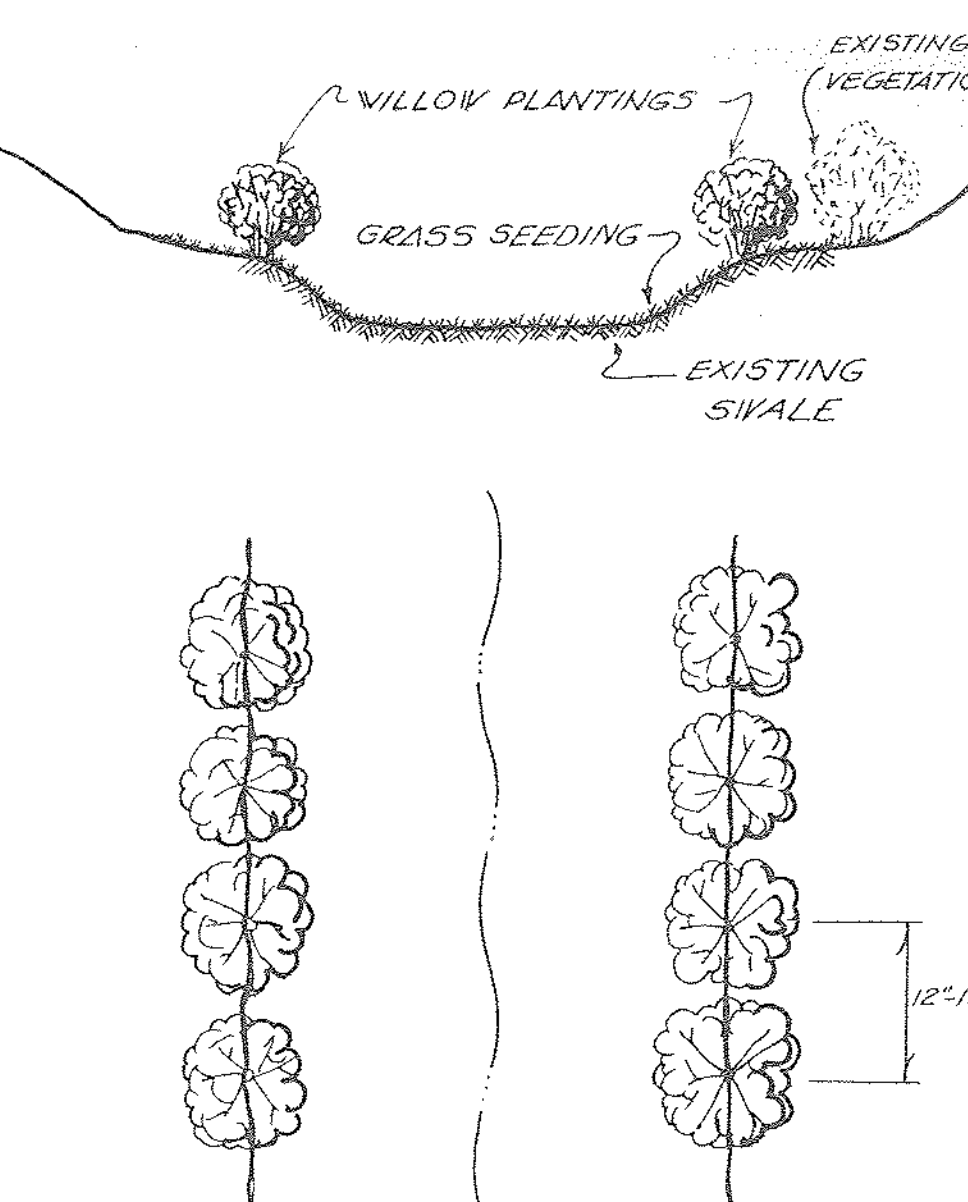
Structure	SP1-SP1	SP1-2	SP2-2	SP2-3	SP3-3	SP3-4	SP4-4	SP4-5	SP5-5
Bottom Width (ft)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Side Slope (ft)	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00
Manning's n	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Slope (ft)	0.09	0.06	0.10	0.07	0.10	0.07	0.12	0.06	0.08
Water Depth (ft)	0.81	1.24	0.92	1.28	0.72	1.04	0.55	0.81	1.00
Freeboard (ft)	1.19	1.12	1.19	1.12	1.18	1.11	1.15	1.10	1.25
Total Channel Depth	2.0	2.4	2.0	2.4	1.9	2.3	1.7	1.9	2.4
Channel Topwidth	22.2	24.9	22.1	25.2	17.4	19.8	16.1	17.5	25.5

Wooden Drop Design Parameters

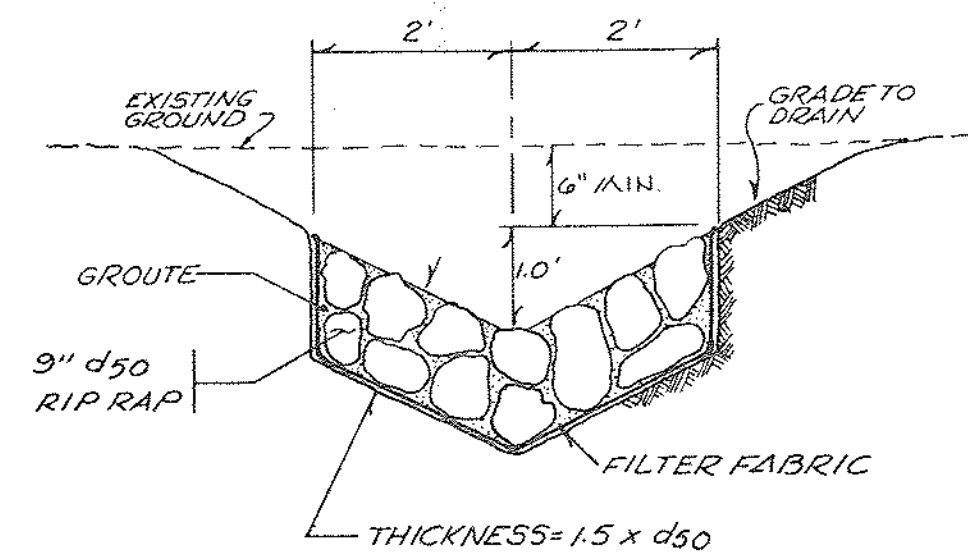
Parameter	SP1-SP1	SP1-2	SP2-2	SP2-3	SP3-3	SP3-4	SP4-4	SP4-5	SP5-5
Number of Drops	3	6	2	2	2	2	2	2	5
Feed Drop	2	2	2	2	2	2	2	2	2
Total Feet of Drop	6	12	4	4	4	4	4	4	10
Trapezoidal opening (ft²)	10	10	10	10	10	10	10	10	10
Width (ft)	6	6	6	6	6	6	6	6	6
Depth (ft)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Side Slope	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00
Channel Topwidth (ft)	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Riprap Type	L	L	L	L	L	L	L	L	L
Riprap Depth (inches)	6	6	6	6	6	6	6	6	6
Riprap Depth (inches)	18	18	18	18	18	18	18	18	18
Approach Length	5	5	5	5	5	5	5	5	5
Runout Length	10	10	10	10	10	10	10	10	10
Layers of 8" ties	4	4	4	4	4	4	4	4	4
Shove crest	3	3	3	3	3	3	3	3	3
Down crest	3	3	3	3	3	3	3	3	3
Any below crest	3	3	3	3	3	3	3	3	3
Total	9	9	9	9	9	9	9	9	9

NOTES:  
 (1) Drops all have trapezoidal openings of 6 feet bottom width (approximate existing channel with various depths)  
 (2) Trapezoidal channel dimensions pertain to the upstream approach, the downstream runout, and the trapezoid defined by the timber tie wall.  
 (3) Depth includes freeboard.  
 (4) Width of trapezoidal channel plus 6 feet on each side if valley is wide enough.

- GENERAL NOTES:
- DIMENSIONS ON STRUCTURES MAY REQUIRE ADJUSTMENT TO MEET SITE SPECIFIC TOPOGRAPHY.
  - SPECIFIC SITES FOR DROP STRUCTURES WILL BE SELECTED BY KIH STAFF.
  - COLORADO SPRINGS UTILITIES GUIDELINES WILL BE ADHERED TO TO AVOID UTILITIES DAMAGE.



DETAIL 4



DETAIL 5

GROUDED SIVALE - MATCH TO 2' CURB CUT AT LOW END OF LYRIC POINT & MOONSTONE VIEW. IN POND # 5 MATCH TO TRICKLE CHANNEL. PROVIDE 5'x5' ROCK PAD @ BASE OF SIVALE BELOW MOONSTONE VIEW.

- VEGETATION:
- VEGETATION IS TO BE PLANTED WITH PROPER CARE AND HANDLING TO ENSURE PLANT GROWTH.
  - SOIL AMENDMENTS MAY BE REQUIRED.
  - INDIVIDUAL PLANTS ARE TO BE PLANTED ALONG EXISTING CHANNEL BANKS AT DISTANCES OF 12" TO 18".

DATE: 4/14/92  
 PLOT: 4/14/92

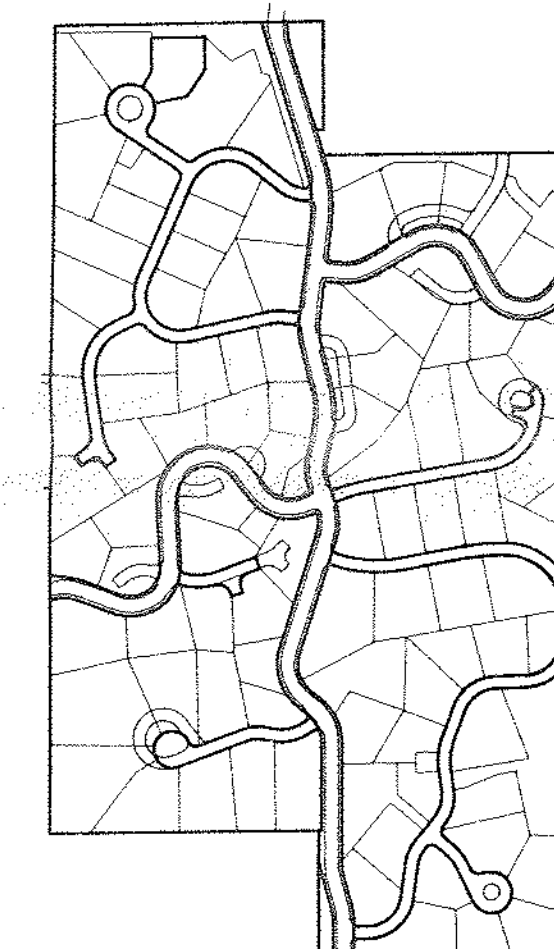
**KLH ENGINEERING, INC.**  
 ENGINEERS / SURVEYORS / PLANNERS  
 208-208 SUTTON LANE, COLORADO SPRINGS, COLORADO 80907 719-594-4200

SKYWAY HEIGHTS  
 EROSION CONTROL DETAILS

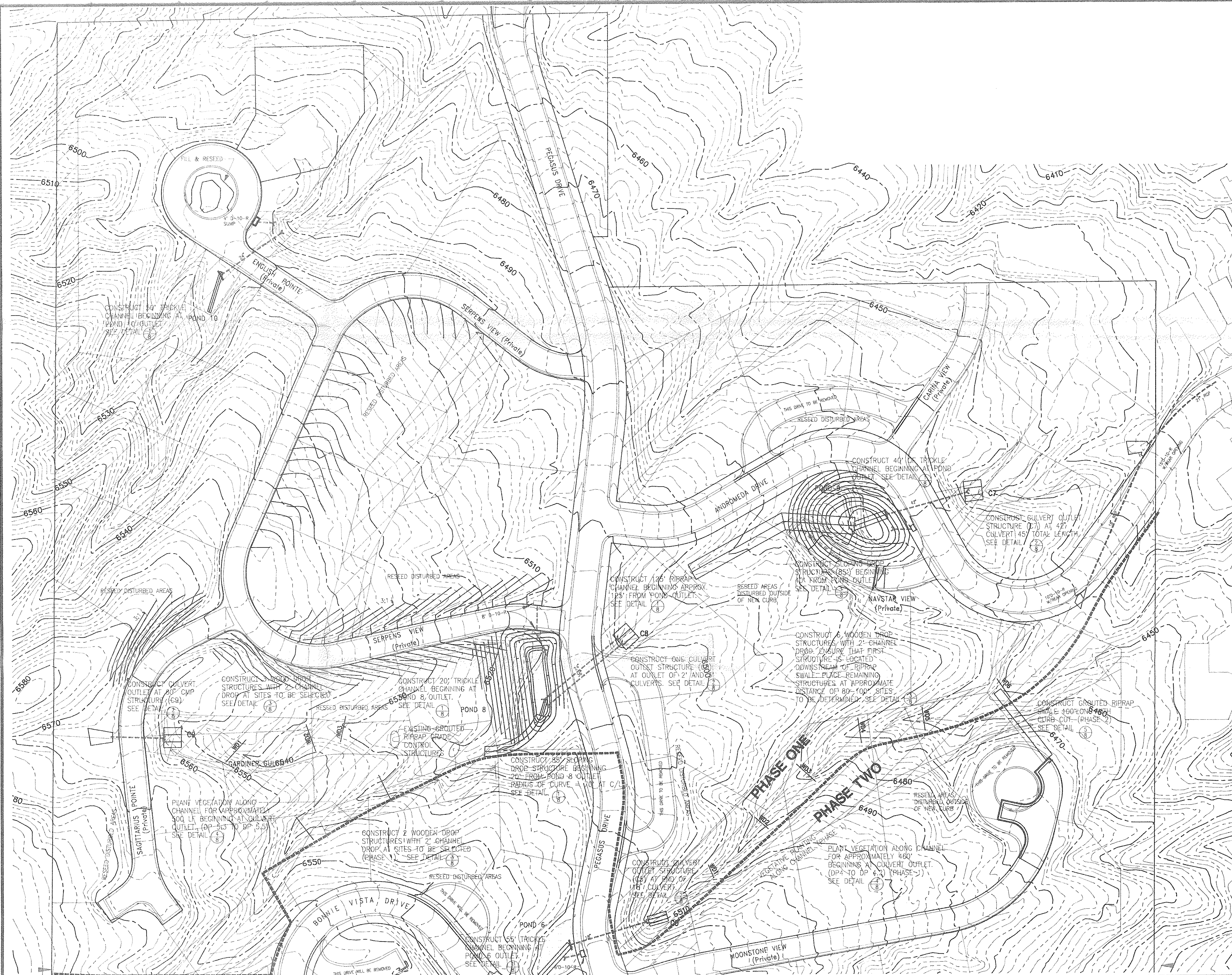
TITLE: 8 OF 8  
 SHEET: 8 OF 8  
 DWG FILE: DTL-EROS  
 VIEW DIRECTION: DATE: 4/14/92  
 SCALE: N.T.S. DRAWN BY: MFS  
 JOB NO: 91-559-00



# SKYWAY HEIGHTS GRADING & EROSION CONTROL - NORTH



OVERALL VIEW



**LEGEND**

- 2' CONTOURS
- 10' CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- PRESERVATION EASEMENTS
- TRICKLE CHANNEL  
SEE DETAIL 1 SHEET B
- SLOPING DROP STRUCTURE  
SEE DETAIL 1 SHEET B
- CULVERT OUTLET STRUCTURE  
SEE DETAIL 2 SHEET B
- PIPE/CULVERT
- MAXIMUM WATER SURFACE AT OVERTOPPING LEVEL

DATE: 4/23/92  
 PLOT: 4/27/92  
 XREF: SW-BASIN, INDEX, INTER, SKYPONDS, LOTS

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 206-208 SUTTON LANE, COLORADO SPRINGS, COLORADO 80907 719-594-4200

**SKYWAY HEIGHTS GRADING & EROSION CONTROL**

TITLE: SKYWAY HEIGHTS GRADING & EROSION CONTROL  
 SHEET: 6 OF 8 DWG. FILE: EROSC1  
 VIEW DIRECTION: DATE: 4/23/92 91-559-00  
 SCALE: 1"=50' DRAWN BY: RKN JOB NO.



# SKYWAY HEIGHTS GRADING & EROSION CONTROL - SOUTH



OVERALL VIEW



### LEGEND

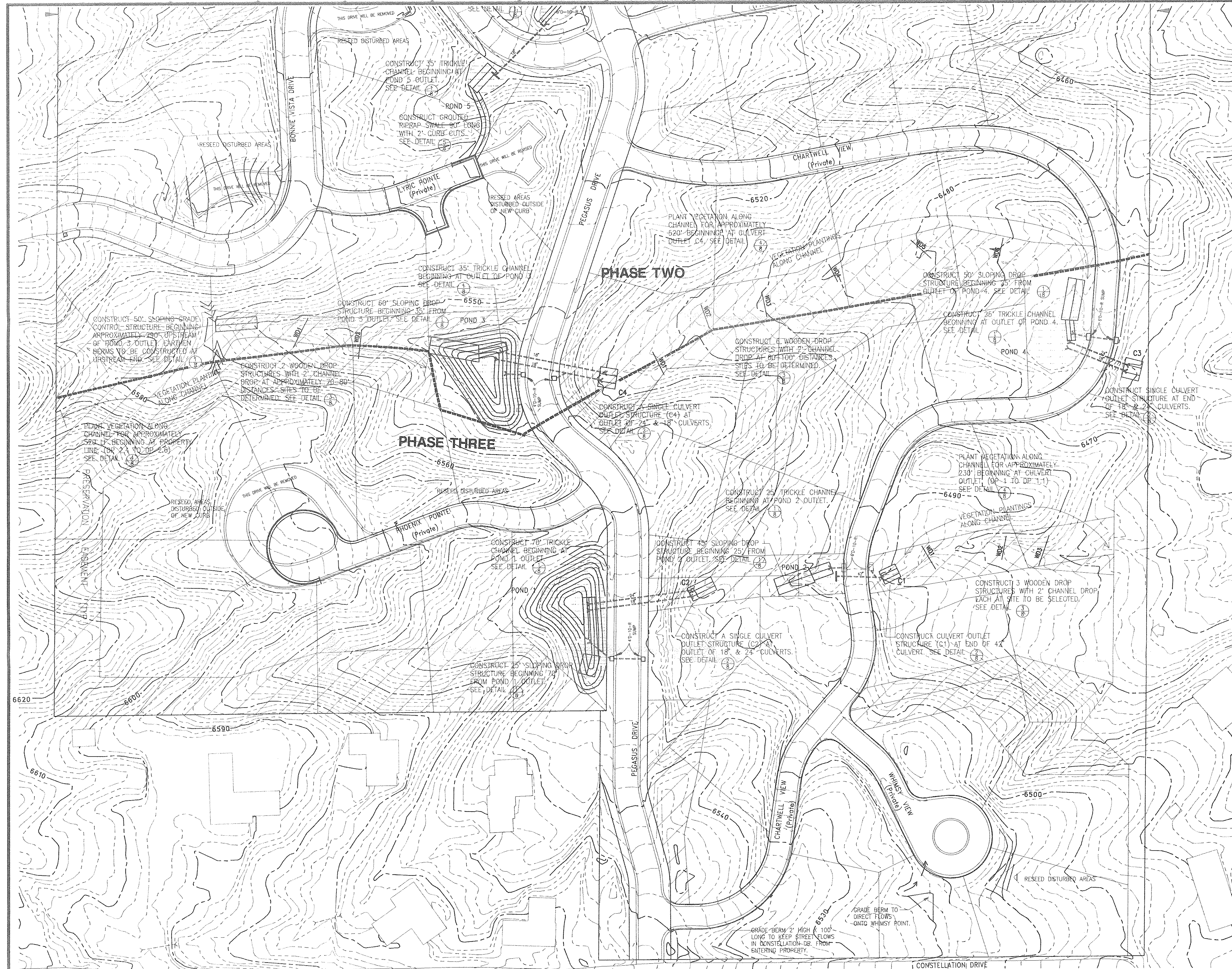
- 2' CONTOURS
- 10' CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- PRESERVATION EASEMENTS
- TRICKLE CHANNEL SEE DETAIL 1 SHEET B
- SLOPING DROP STRUCTURE SEE DETAIL 1 SHEET B
- CULVERT OUTLET STRUCTURE SEE DETAIL 2 SHEET B
- PIPE/CULVERT
- MAXIMUM WATER SURFACE AT OVERTOPPING LEVEL

DATE: 4/23/92  
 PLOT: 4/27/92  
 XREF: SW-BASIN, INDEX, INTER, SKYPONDS, LOTS

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 ENGINEERS / SURVEYORS / PLANNERS  
 208-208 SUTTON LANE, COLORADO SPRINGS, COLORADO 80907 719-594-4200

**SKYWAY HEIGHTS GRADING & EROSION CONTROL**

SHEET 7 OF 8 DWG FILE: EROSCTL  
 VIEW DIRECTION: DATE: 4/23/92 91-559-00  
 SCALE: 1"=50' DRAWN BY: RKN JOB NO.





**EROSION CONTROL/GRADING PLAN STATEMENTS**

**ENGINEER'S STATEMENT:**

This Erosion Control/Grading Plan was prepared under my direction and supervision and is, to the best of my knowledge and belief, in accordance with the best engineering practice. I am not responsible for any hazard to life and limb, endangering property or other property, or for any other liability of any kind, arising from the use of this plan, or for any other liability of any kind, arising from the use of this plan, or for any other liability of any kind, arising from the use of this plan.

*Kent Rockwell*  
 PROFESSIONAL ENGINEER  
 No. 25886  
 Exp. 12/31/92

**DEVELOPER'S STATEMENT:**

I, the developer, have reviewed and will comply with all the requirements in this Erosion Control/Grading Plan.

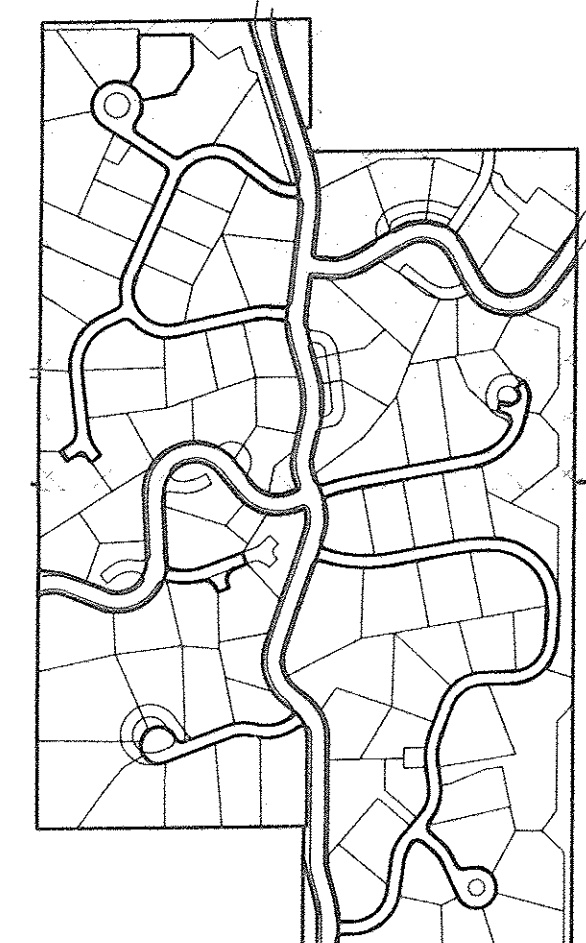
BY: *[Signature]*  
 TITLE: *[Title]*  
 ADDRESS: *[Address]*

**CITY OF COLORADO SPRINGS**

Filed in accordance with Section 15-3-1501 of the Code of the City of Colorado Springs, 1980, as amended.  
 \* *[Signature]* 5/20/92  
 CITY ENGINEER DATE

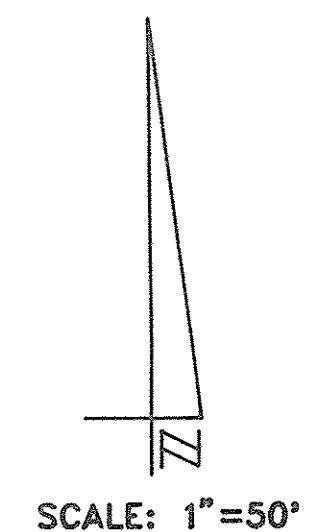
# SKYWAY HEIGHTS GRADING & EROSION CONTROL - NORTH

## PHASE ONE ONLY



### OVERALL VIEW

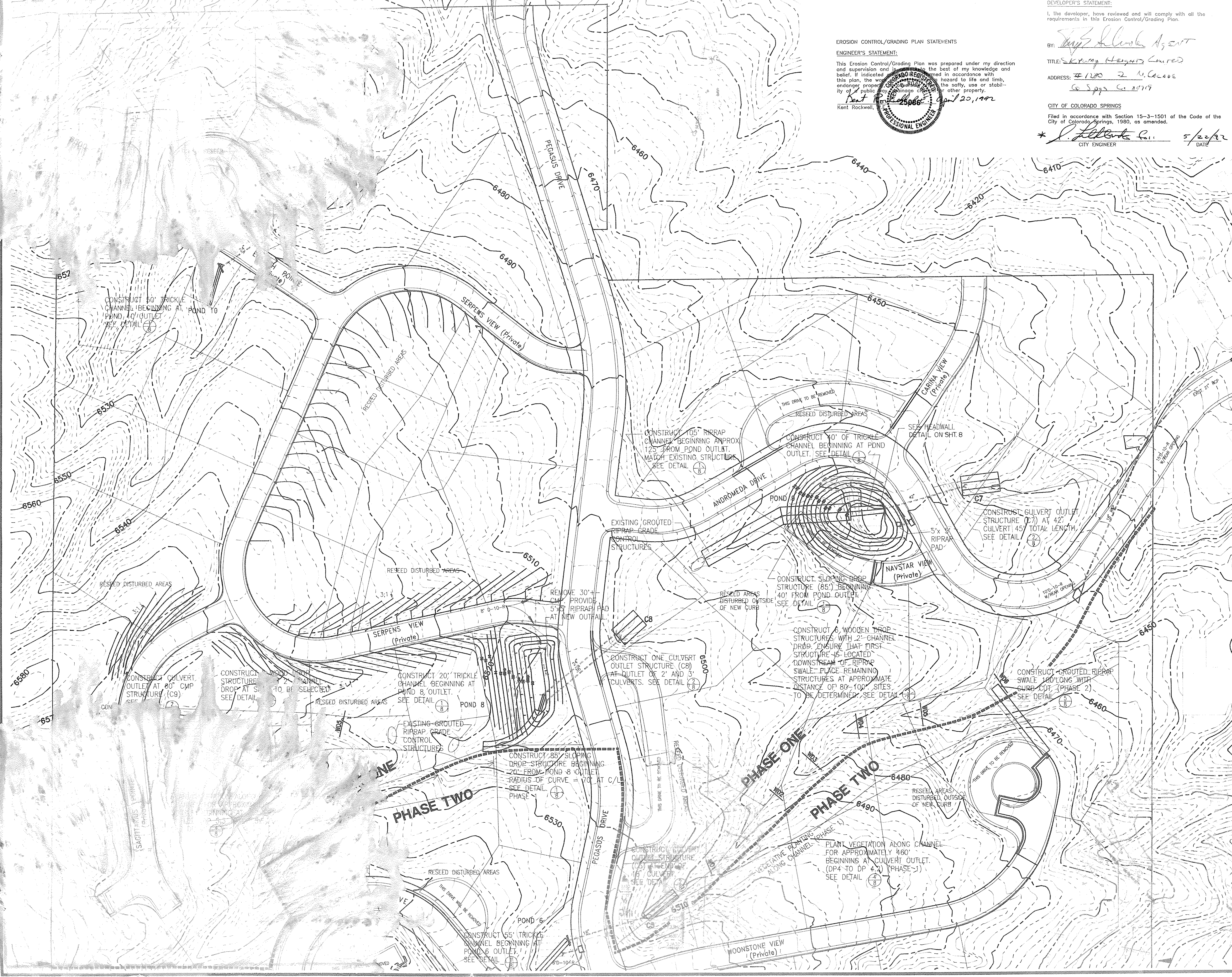
NOTES:  
 1.) SHOWN AS "PROPOSED" IN BID DOCUMENT.  
 2.) SLOPE BOTTOM OF PONDS TO DRAIN AT 1:20 MIN.  
 3.) MAX. SIDE SLOPE IN PONDS TO BE 2.5:1



SCALE: 1"=50'

**LEGEND**

- 2' CONTOURS
- 10' CONTOURS
- PROPOSED CONTOURS
- PROPERTY LINES
- PRESERVATION EASEMENTS
- TRICKLE CHANNEL SEE DETAIL 1 SHEET 8
- SLOPING DROP STRUCTURE SEE DETAIL 1 SHEET 8
- CULVERT OUTLET STRUCTURE SEE DETAIL 2 SHEET 8
- PIPE/CULVERT
- MAXIMUM WATER SURFACE AT OVERTOPPING LEVEL



DATE: 5/19/92  
 PROJECT: SKYWAY HEIGHTS GRADING & EROSION CONTROL  
 SHEET: 2 OF 4  
 DRAWN BY: RKN  
 CHECKED BY: [Signature]  
 DATE: 5/19/92  
 SCALE: 1"=50'

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 ENGINEERS / SURVEYORS / PLANNERS  
 200-25 SUTTON LANE, COLORADO SPRINGS, COLORADO 80907 719-594-4200

**SKYWAY HEIGHTS GRADING & EROSION CONTROL**  
 EROSCITL  
 91-559-00