

Proj. #: 420.20

MEMORANDUM

To: Alison Pedley
From: Nathan Chorey
Date: June 1, 2016
Re: TTAD – Trail Master Plan Cost Estimate

At the request of the Truckee Trails Foundation, Auerbach Engineering Corporation (AEC) has reviewed the Truckee-Tahoe Airport District's (TTAD) Trail Master Plan and prepared a concept-level construction cost estimate for approximately 25,400 linear feet of hard surface paved trail.

To develop the cost estimate, AEC relied upon their previous project experience, as well as bid results from the following local projects.

- Northstar Community Services District, Martis Valley Trail Segment 1A.
- Northstar Community Services District, Martis Valley Trail Segment 1B1.
- Town of Truckee, Truckee River Legacy Trail Phase 3A.
- Town of Truckee, Truckee River Legacy Trail Phase 3B.

We analyzed the bid results of the above projects and calculated a cost per unit length of trail (\$/LF). The unit cost for each of the above trails varies wildly at first glance, but upon studying it further, the variation can be attributed to a number of factors including the extent of amenities along the trail, number of trailheads, road crossings, drainage crossings, boardwalks, and slope of the existing terrain.

For the prepared cost estimate, we provided individual line items for each variable we identified during our review of the local bid results. Generally, we have assumed a moderate level of amenities similar to what is provided along the Martis Valley Trail. The number of trailheads, road crossings, drainage crossings, and linear feet of boardwalk is based on our review of Attachment A provided by Truckee Trails Foundation, and the profile generated from LiDAR contour data. This profile is too conceptual to see every potential need for a drainage structure or boardwalk or bridge, but it does give us some indication of the terrain.

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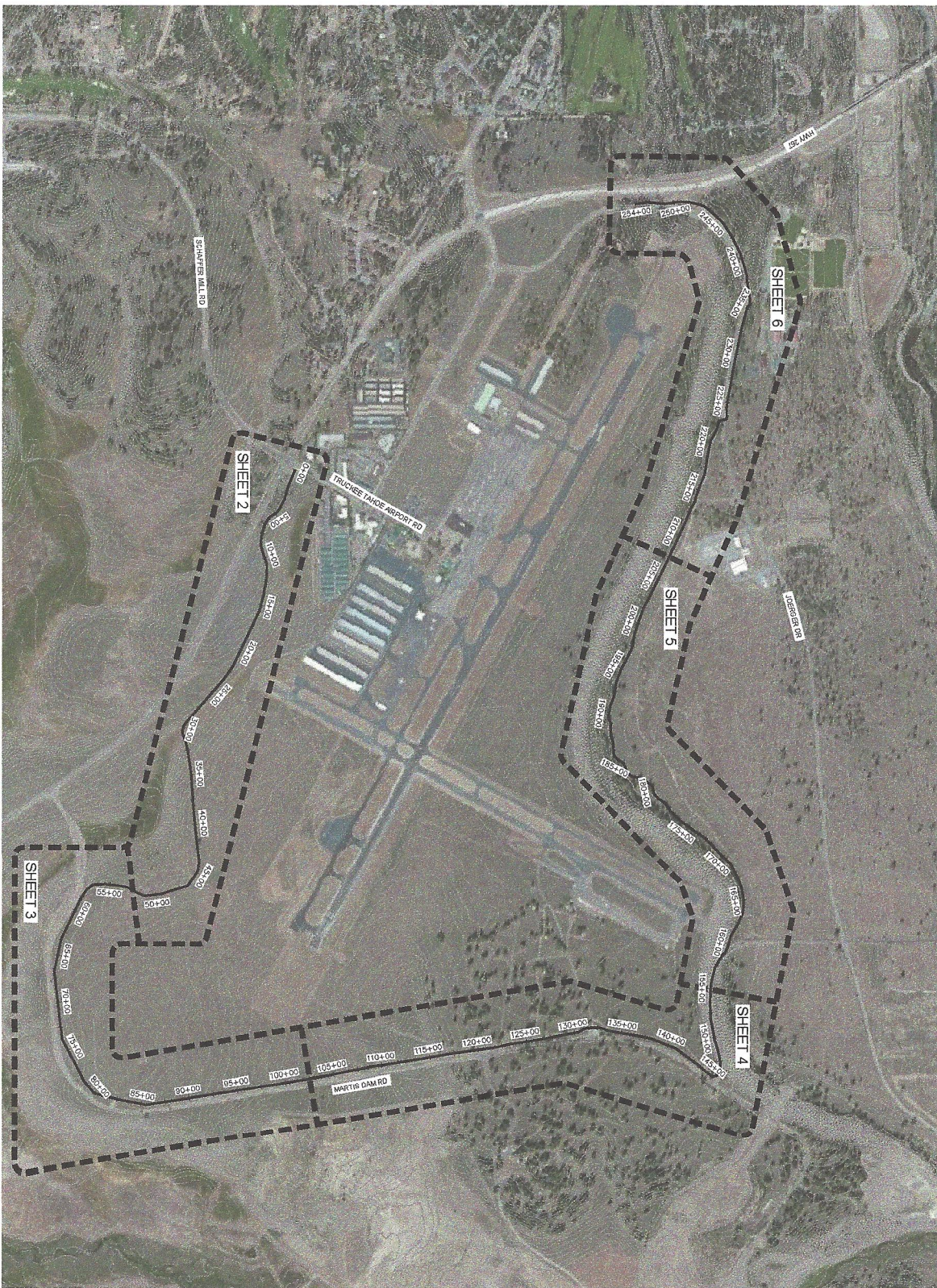
Lastly, utilizing available LiDAR data, the slopes of the existing terrain were analyzed, and categories (or ranges) of slopes through the project corridor were created. Our experience is that the cost per unit of trail rise as the natural ground slopes rise, primarily due to grading requirements. We calculated the total quantity of trail within each slope category, and applied a unit cost to those quantities.

The completed conceptual cost estimate is attached. Note that several sections of trail were identified that would not meet strict ADA standards of 5% longitudinal slope. That goal is the highest standard, but may not be achievable in all cases, and there are other standards which could be relied upon to increase profile grade. Having said that, if 5% is the target, these sections of trail will cost more to construct as it will require lengthening the trail between landing points to reach that maximum grade.

We have applied a fairly generous contingency to the estimate to account for the above unknowns. The contingency might also be seen as a buffer for cost escalation over time. As the design progresses and a schedule becomes more in focus, both the unit costs and cost escalation can be accounted for in a more detailed manner, and the contingency can be reduced.

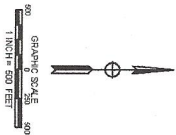
Truckee Trails Foundation
 TTAD - Trails Master Plan
 Concept-Level Estimate of Costs
 June 1, 2016

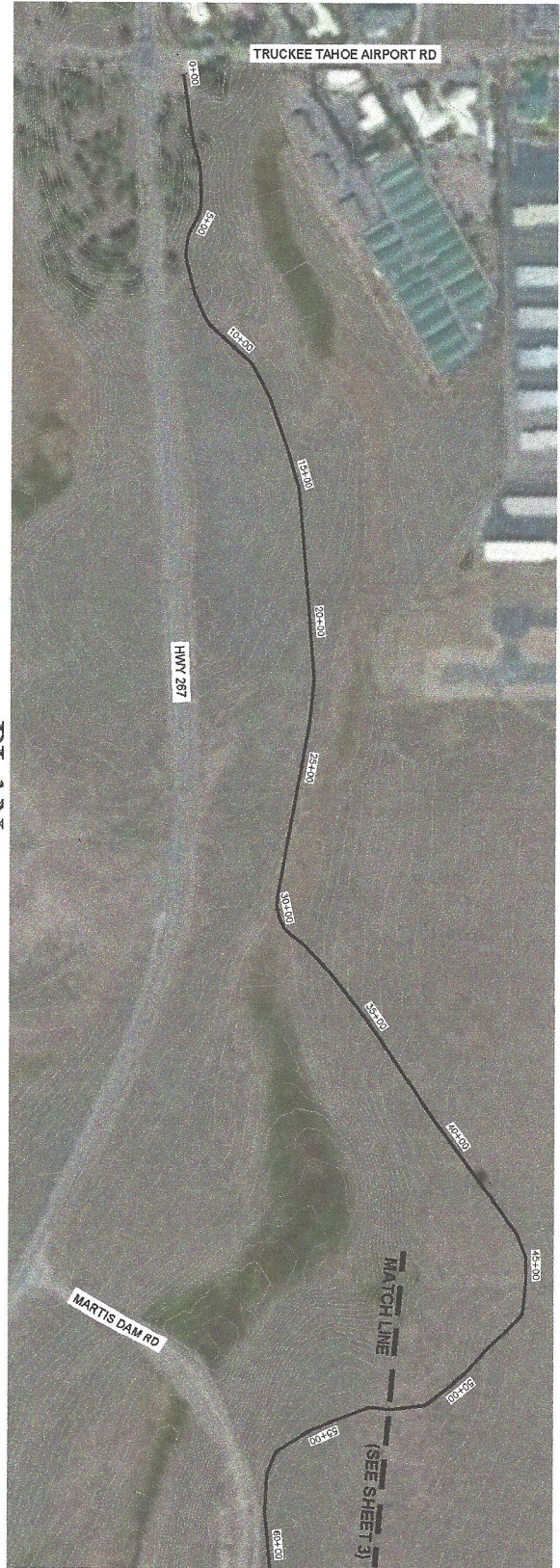
Item Number	Description	Quantity	Unit	Unit Price	Total
1	0% - 2% Trail	7,381	LF	\$ 170	\$ 1,254,770
2	2% - 10% Trail	14,677	LF	\$ 190	\$ 2,788,630
3	10% - 20% Trail	2,525	LF	\$ 220	\$ 555,500
4	20% - 30% Trail	479	LF	\$ 280	\$ 134,120
5	30%+ Trail	322	LF	\$ 360	\$ 115,920
6	Boardwalk	150	LF	\$ 1,500	\$ 225,000
7	Road Crossing	1	EA	\$ 60,000	\$ 60,000
8	Trailhead	5	EA	\$ 2,000	\$ 10,000
9	Drainage Crossing	3	EA	\$ 20,000	\$ 60,000
				Sub-Total \$	5,203,940
				Contingency (25%) \$	1,300,985
				Total \$	6,504,925



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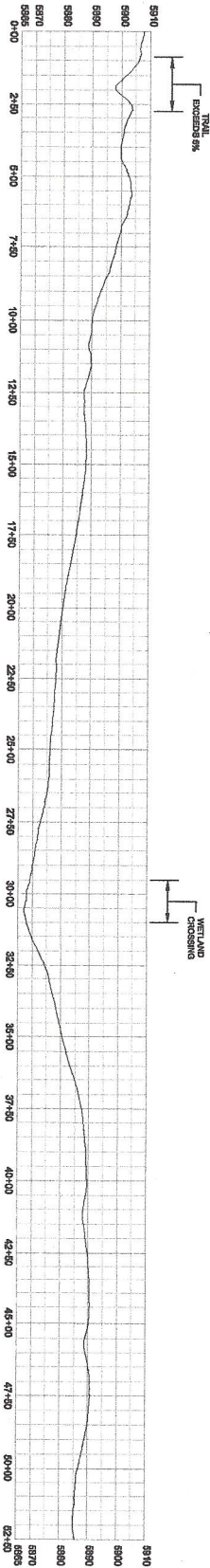
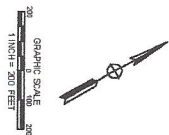
Sheet 1 of 7
Overall Layout
 TTAD Trail Master Plan
 Truckee Trails Foundation
 420.20 June 1, 2016





PLAN

SCALE: 1" = 30'

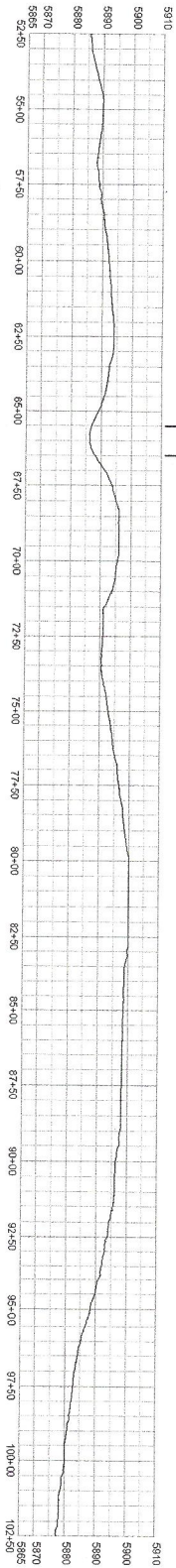
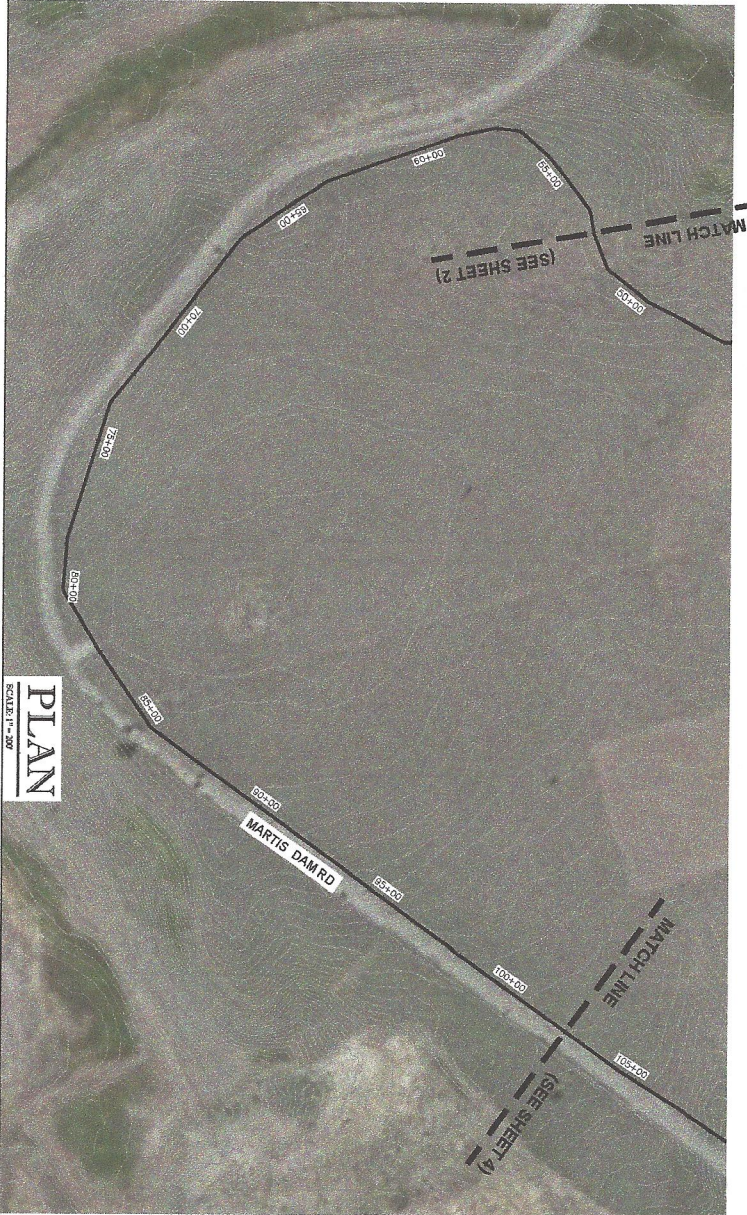


PROFILE

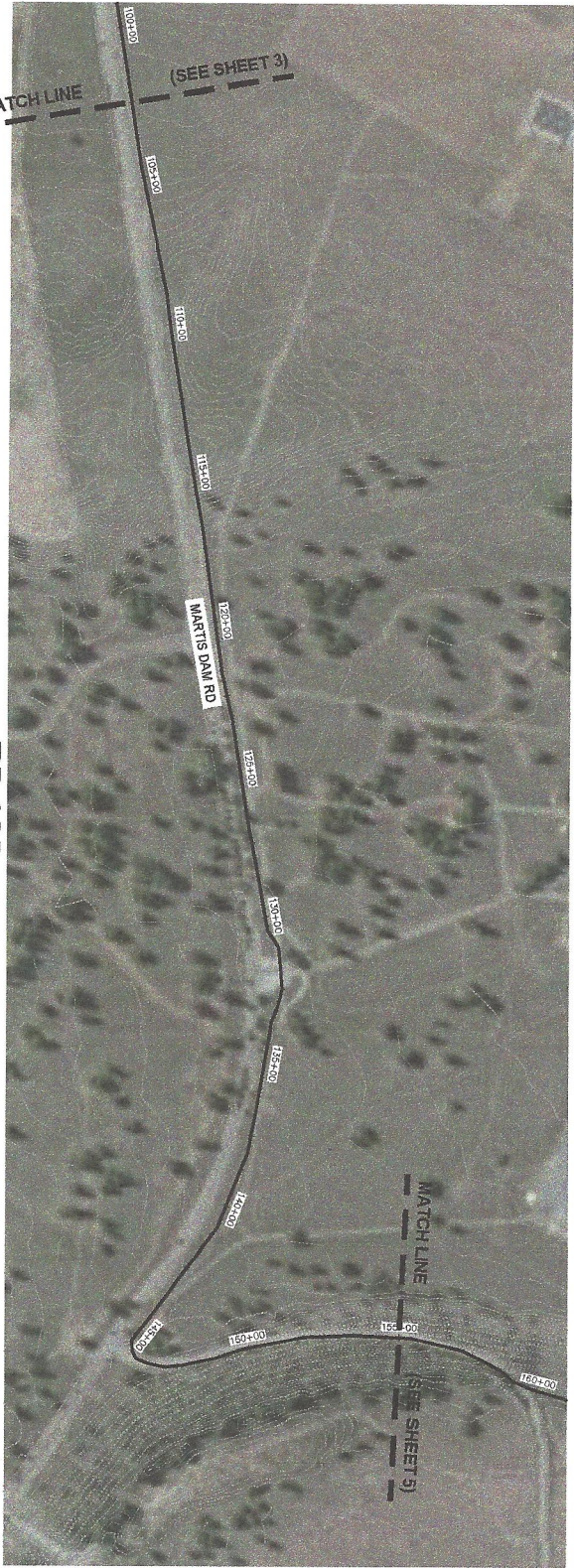
SCALE: (H) 1" = 200'
(V) 1" = 20'

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Plan and Profile
 TTAD Trail Master Plan
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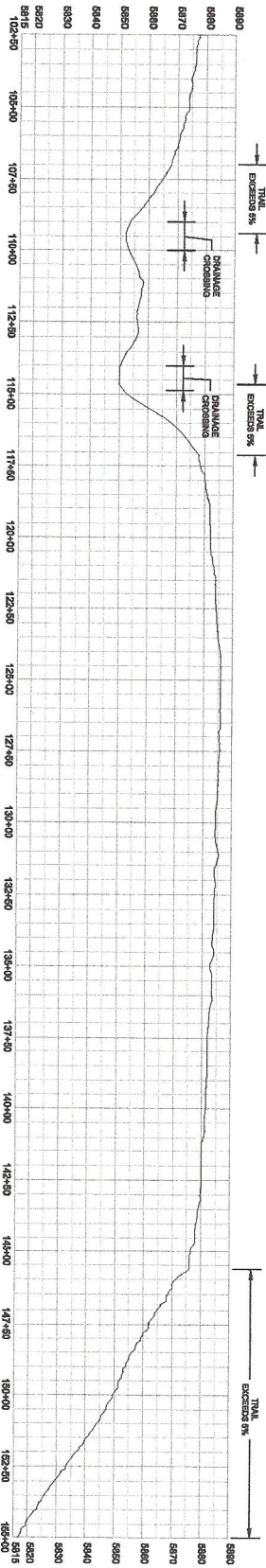
PROFILE
SCALE: (H) 1" = 200'
(V) 1" = 20'



PLAN

SCALE: 1" = 20'

GRAPHIC SCALE
1" = 200 FEET



PROFILE

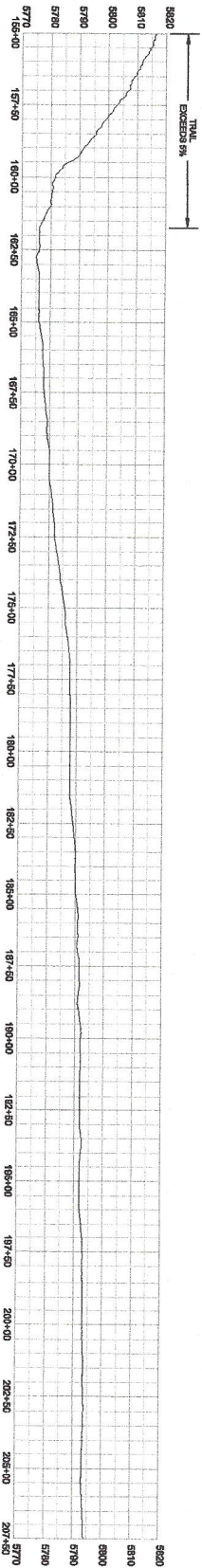
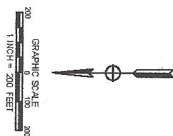
SCALE: (H) 1" = 20'
(V) 1" = 5'

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 Plan and Profile
 TTAD Trail Master Plan
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PLAN

SCALE: 1" = 200'



PROFILE

SCALE: (H) 1" = 200'

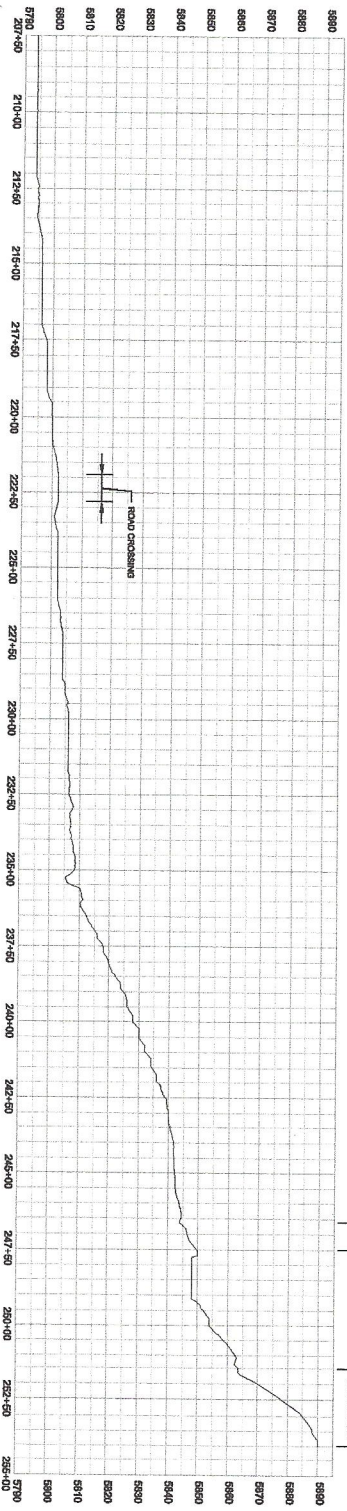
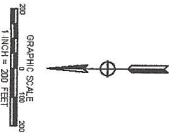
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 Plan and Profile
 TTAD Trail Master Plan
 Truckee Trails Foundation
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PLAN

SCALE: 1" = 20'

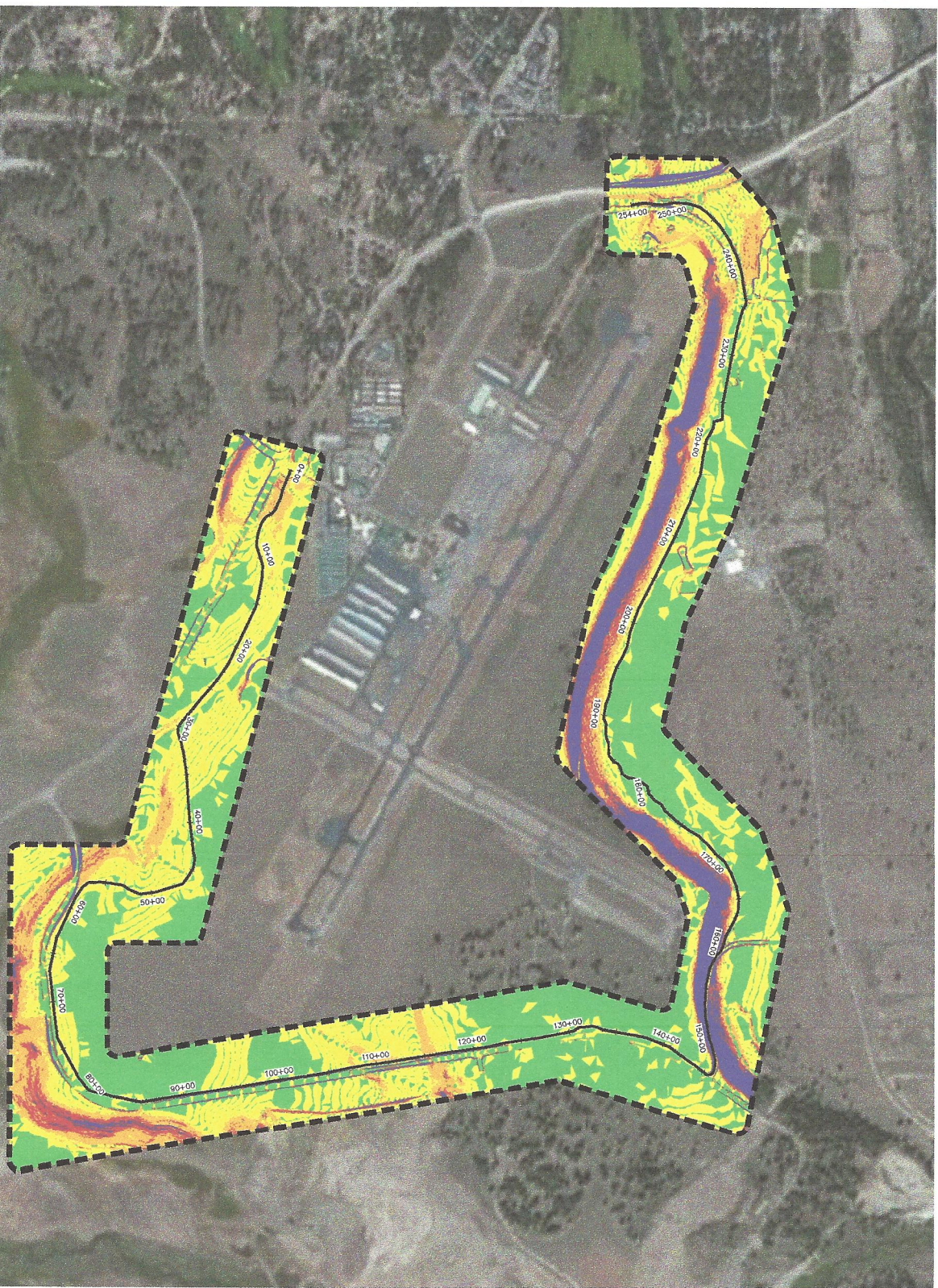


PROFILE

SCALE: (H) 1" = 20'
(V) 1" = 2'

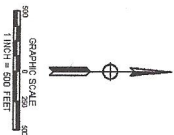
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 Plan and Profile
 TTAD Trail Master Plan
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Slopes Table			
Number	Minimum Slope	Maximum Slope	Color
1	0%	2%	Green
2	2%	10%	Yellow
3	10%	20%	Orange
4	20%	30%	Red
5	30%	34+	Dark Red

TOTAL LENGTHS
 0% - 2% = 7,391 LF
 2% - 5% = 1,252 LF
 5% - 10% = 1,252 LF
 10% - 20% = 4,752 LF
 20% - 30% = 4,752 LF
 30% - 34% = 426 LF



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Slope Map
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