

# TECHNICAL MEMORANDUM



**MONTGOMERY WATSON**

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**To:** Dan Brewster, The Summit at Snoqualmie  
**From:** Frank Postlewaite  
**Subject:** Summit At Snoqualmie – Mountaintop Restaurant Utility Corridors

**Date:** September 6, 2000  
**Reviewed by:** Pat Burke  
**Enclosure:** Utility Alignment & Detail Drawings

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## SCOPE OF WORK

Montgomery Watson was contracted by The Summit at Snoqualmie to evaluate utility extensions to proposed mountaintop restaurants at the Alpentel and Summit East ski areas, and at a renovation of the Thunderbird Lodge at Summit West. Each of the restaurant facilities will require pipelines for water supply and wastewater collection. Additionally power and communications will be required for the upper Alpentel alignment. This evaluation consists of two tasks. Task 1 was completed on September 2, 1999 and consisted of a one-day site visit of each potential corridor. Task 2 consists of developing this technical memorandum and includes the following:

- estimating potable water demand and wastewater generation at each of the proposed restaurants
- establishing design criteria
- sizing facilities for the projected demands
- proposing alignments for each utility
- estimating costs for proposed improvements

### Potable Water Demand and Wastewater Generation

The restaurant water demand and wastewater generation dictates the sizing of the potable water supply and wastewater sewer facilities. Daily flow estimates for water supply and wastewater flow are equal since the only water use is associated with the kitchen and restroom facilities. No flow for fire protection or other uses is considered.

The unit flow values, which serve as the basis of the estimated flow, are based on the values presented by the "American Water Works Association" and the "National Small Flows Clearinghouse." Restaurants with toilets have an associated water use of 7 to 10-gallons per patron per day. Restaurants without toilets require 2.5 to 3 gallons per patron per day. The proposed facility will have "very low flush" type toilets (assumed to require about 1-gallon per flush). The unit flow, for restaurants with toilets, is assumed to be based on restaurants with toilets requiring at least 4 gallons per flush. Therefore, the flow attributed to restrooms use is

reduced by 25-percent, resulting in a revised unit flow of 3.60 to 4.75 gallons per patron per day. For the purposes of this technical memorandum a unit flow value of 5-gallons per patron per day is used.

Further assumptions are necessary to complete the demand estimate. For peak use, the hours of operation for the restaurants is assumed to be 10-hours per day, the average stay between customers is assumed at 1.5-hours, and the seating fully utilized. The following Table 1 – Restaurant Flow & BOD<sub>5</sub> Estimates, presents the estimated flow associated with each facility.

An estimate of Biological Oxygen Demand (BOD<sub>5</sub>) is also presented in Table 1. This estimate is based on a unit value of 0.021-lbs. BOD<sub>5</sub> per patron per day (“National Small Flows Clearinghouse”).

**Table 1 – Restaurant Flow & BOD<sub>5</sub> Estimates**

Facility	Seating	Patrons / day	Flow, gpd	Lbs BOD <sub>5</sub> / day
Alpental	150	1,000	5,000	21
Summit West	100	667	3,335	14
Summit East	120	800	4,000	17

Note the average design flowrate required during the 10-hour period of operation is:

- Alpental: 8.3-gpm
- Summit West: 5.6-gpm
- Summit East: 6.7-gpm

### Design Criteria

The design criteria for the proposed facilities is presented as it pertains to each component of the proposed utility extensions. The criteria is presented as it pertains to piping, freeze protection, pumping, storage, and electrical improvements. The potable water piping is the long buried or above grade water supply pipelines extending from the existing water systems up to the proposed restaurants. The sewer piping returns the wastewater from the restaurant to the existing sewer facilities at the base of the ski areas. Freeze protection will be required on all aspects of the facilities. Potable water pumping is required both for lifting the water up to storage located at the proposed restaurant and for supplying service pressure to the restaurant from the potable water storage tank located at the restaurant. A sewage grinder pump is used to allow for clog-free operation of a 2-inch diameter sewage conveyance pipeline from the restaurant to the existing facilities below. A potable water storage is located at the proposed restaurant site and serves to make up the difference between the relatively low supply flowrate and the higher restaurant water demand. The water storage also provides standby storage. Electrical and control improvements are required on the upper portion of the Alpental alignment (above the first chairlift, Debbie’s Gold).

The following list presents the criteria for each type of improvement.

- Potable Water Piping:
  - Schedule 80, A53, Grade A, Type F, Galvanized Steel.

- Minimum safety factor of 2.0 for the pipe strength resisting pressure.
  - 20-mil x 2" wide polyethylene tape for corrosion protection.
  - Class 150 fittings for working pressures less than 300-psi.
  - Class 300 fittings for working pressures greater than 300-psi.
- Sewer Piping:
    - High Density Polyethylene with SDR 17.
    - Minimum velocity 3 fps.
- Freeze Protection:
    - 1" thick "Armaflex" foam insulation with aluminum cladding for exposed piping.
    - 28-inch minimum un-insulated cover for buried piping.
    - 16-inch minimum cover for buried piping insulated with 2-inch thick extruded polystyrene insulation board with minimum 20-psi compressive strength.
    - Temperature monitoring and control using an RTD (resistive thermal device) at the pipeline outlet.
    - Heated enclosures around the pumping and storage facilities.
- Potable Water Pumping:
    - High pressure piston/plunger pumps for lower station pumping.
    - Variable speed drives for flow regulation of the lower station pumping.
    - Complete redundancy for pumping capacity.
    - End suction centrifugal pumps with hydro-pneumatic tank configuration for restaurant service.
- Sewage Pumping:
    - Duplex grinder pumps located at the restaurant site.
    - Level control (pressure switch or level transmitter) with high level alarms.
    - "Fast out" rail type pump removal system.
    - Minimum pump cycle time of 15 minutes.
    - Capacity will meet or exceed the restaurant "service" pumping capacity.
- Water Storage
    - Enclosed Fiberglass Tank with access hatch and overflow.
    - 1-foot of operational storage.
    - 1-day of standby storage.
    - Tank height approximately 9-feet over all.
    - Tank located within a heated and enclosed area, separate from the sewage system.
- Electrical
    - Raceways will be galvanized rigid conduit.
    - Power supply will be nominal 7200-volt.
    - Communication extension will be hardwired.

## Facility Sizing

The facility sizing is based on the two previous sections; Demand and Design Criteria. A summary of the sizing is presented below.

- Potable Water Piping:
  - The Demand Section describes the required average 10-hour rate of demand between 5.6 and 8.3-gpm. All facilities are sized to provide a 10-gpm supply rate to the restaurant storage tank.
  - The working pressures, based on the change in elevation and friction loss at a 10-gpm flowrate result in maximum working pressures of 1,100, 329, and 365-psi at Alpentel, Summit West, and Summit East respectively.
  - 1-1/4-inch pipe is proposed at all the sites. This provides moderate pressure-loss associated with the low flowrate and relatively high strength associated with the small pipe diameter.
- Sewer Piping:
  - 2-inch inside diameter piping is proposed for the sewage pipeline.
  - Actual minimum velocity at the design pumping rate is 5 fps (slug flow is likely to achieve higher velocity due to the very steep grade of the piping).
- Freeze Protection:
  - 3-watt per foot heat trace is required on the potable water piping.
  - 5-watt per foot heat trace is proposed for the sewage piping.
- Potable Water Pumping:
  - 10-hp, 10-gpm by 1040-psi TDH rated pumps are proposed for the lower Alpentel Pump Station.
  - 2-hp, 10-gpm by 330-psi TDH rated pumps are proposed for the lower Summit West Pump Station.
  - 2-hp, 10-gpm by 370-psi TDH rated pumps are proposed for the lower Summit East Pump Station.
  - 5-hp, 60 gpm by 70-psi TDH rated pumps are proposed for all the restaurants with a 110-gallon (38 gallons of active storage) hydro-pneumatic tank, and 70/40-psi (cut-out/cut-in) pressure switch control.
- Sewage Pumping:
  - 2-hp, 60-gpm by 50-foot TDH rated grinder pumps are proposed for all the restaurants.
  - Pumps will be located in a 600 gallon wet-well (4-feet of active storage)
- Potable Water Storage
  - 5,700-gallons of active storage is proposed for the lower Summit West Pump Station.
  - 3,800-gallons of active storage is proposed for the lower Summit East Pump Station.
  - 4,700-gallons of active storage is proposed for the lower Summit East Pump Station.
- Electrical

- A 2" conduit containing 3, #6 gage conductors is proposed for the 7,200-volt upper Alpentel service upgrade.
- A ¾" conduit containing 3, #8 gage conductors is proposed for the Alpentel heat trace power supply.
- A 1" conduit containing a #16 gage 20 pair shielded cable is proposed for the Alpentel communications upgrade.

## **Proposed Alignments**

The alignment for each utility extension are depicted on the attached drawings 2, 3, and 4 for the Summit East, Summit West, and Alpentel ski areas respectively. The cover sheet, drawing 1, presents a overall location map, depicting the limits of each drawing. These alignments are based on evaluating the best routes considered during the Task 1 site visit. Each alignment is described as follows:

### **• Summit East**

The lower potable water pump station and sewer connection at Summit East will be located along an access part way up the mountain were utilities already exist to serve home in this area. A new enclosure will be built for the pump station and a new manhole installed for the sewer connection. Water and sewer pipelines will run south from this point to the ski slope. From the ski slope, the pipeline will turn to the southwest and continue up the fall line of the slope to the proposed restaurant. See Drawing 2 for a depiction of the alignment, Drawing 5 for a profile, and Drawing 5 for details of the proposed improvements. Each pipeline is anticipated to be completely buried to the minimum cover depth of 28-inches, therefore additional freeze protection should not be required for the buried pipelines.

### **• Summit West**

The lower pump station at Summit West is anticipated to be housed within the existing maintenance building at the base of this ski area. The connection to the existing sewer pipe will be made adjacent to this building. The proposed pipeline route extends up the ski slope, following the more gradual runs to the existing Thunderbird Lodge at the top, as depicted on Drawing 3. The entire alignment will be buried. Supplemental foam insulation board freeze protection is anticipated on the upper portion where the minimum cover depth of 28-inches may be difficult to achieve.

### **• Alpentel**

The Alpentel alignment is the longest and most challenging of the three proposed improvements. The first section will extend from potable water pump station and sewer connection (at an existing manhole) at the base, up the ski slope to the top of the first chairlift (Debbie's Gold). This alignment will include buried water and sewer piping with sections requiring foam insulation board for additional freeze protection. Drawing 4 and 5 depict the alignment and profile respectively.

The second portion will include water and sewer piping, power conduit and conductors, and communication conduit and conductors. This alignment is proposed to extend diagonally up the slope from the top of the lower chairlift (Debbie's Gold). From this point it crosses under the second chairlift (Edelweiss) and extends up the northern limits of the ski run area, just skirting

the forested slope. The last portion will climb up a ravine just east of the upper chairlift landing to the proposed restaurant location. This alignment achieves the most gradual traverse of this challenging terrain with the lowest visual impacts. This upper section of the alignment consists of bedrock and talus slopes, requiring that the pipes and conduit be located above grade. Detail 3 on Drawing 6 shows the proposed utility extension protected in a steel channel and plate corridor and mounted on ¾" threaded rods grouted into the existing rock every 20-feet.

Please note: 10-feet of horizontal separation is required between buried potable water and sewer pipelines to meet Department of Health requirements.

### **Cost Estimates**

Table 2 – Construction Cost Estimates, summarizes the estimated construction costs for the each of the three sites. Costs are based on:

- Estimated and quoted material costs,
- Estimated labor charged at \$35 per hour,
- Contractors markup of 25-percent for profit and overhead,
- Contingency of 30-percent for Alpentel and 15-percent for Summit East and Summit West,
- Sales tax at 8.2-percent.

**Table 2 - Construction Cost Estimates**

**Summit East Utility Extensions**

Lower Potable Water P.S.	\$41,000
Underground Potable Water Piping (3600-lf)	\$46,000
Upper Potable Water P.S. & Tank	\$28,000
Upper Sewer P.S. & Tank	\$22,000
Underground Sewer Piping (3600-lf)	\$37,000
<b>Total</b>	<b>\$174,000</b>

**Summit West Utility Extensions**

Lower Potable Water P.S.	\$26,000
Underground Potable Water Piping (2700-lf)	\$42,000
Upper Potable Water P.S. & Tank	\$25,000
Upper Sewer P.S. & Tank	\$22,000
Underground Sewer Piping (2700-lf)	\$28,000
<b>Total</b>	<b>\$143,000</b>

**Alpental Utility Extensions**

Above Grade Utilities Corridor (3200-lf)	\$438,000
Lower Potable Water P.S.	\$50,000
Underground Potable Water Piping (4800-lf)	\$88,000
Upper Potable Water P.S. & Tank	\$38,000
Upper Sewer P.S. & Tank	\$25,000
Underground Sewer Piping (4800-lf)	\$57,000
<b>Total</b>	<b>\$696,000</b>

Note these cost estimates are preliminary in nature and not based on a detailed design and should only be considered for determining overall project feasibility.

## REFERENCES

- AWWA “Design and Construction of Small Water Systems – a Guide for Managers,” 3<sup>rd</sup> Ed. Denver 1989
- National Small Flows Clearinghouse, Spring 2000, Vol 1, Number 2 “The Best Wastewater Systems Consider Flow Rate and Waste Strength,” by Tricia Angoli
- AWWA “Steel Pipe – A Guide for Design and Installation, Manual M11,” 3<sup>rd</sup> Ed. Denver 1989
- American Society of Mechanical Engineers, “1967 ASME Steam Tables,” 4<sup>th</sup> Ed. New York 1979

**Construction Cost Estimate for: Summit East Utility Extensions**

	Materials	Labor	Total
1 Lower Potable Water P.S.	\$16,050	290	\$40,751
2 Underground Potable Water Piping	\$13,660	460	\$46,288
3 Upper Potable Water P.S. & Tank	\$14,700	94	\$27,981
4 Upper Sewer P.S. & Tank	\$9,900	130	\$22,475
5 Underground Sewer Piping	\$4,890	540	\$37,002

Material Cost \$59,200

Labor Rate, \$/hr: \$35 \$52,990 1514

Subtotal 1 \$112,190

Markup 25% \$28,048

Subtotal 2 \$140,238

Contingency 15% \$21,036

Subtotal 3 \$161,273

Sales Tax 8% \$13,224

**Total \$174,498**

Quantity	Units	Description	Unit Price	Materials	Labor	Total
		1 Lower Potable Water P.S.		\$16,050	290	\$40,751
1	Alw	Connection to Existing Water Pipe	\$250.00	\$250	24	\$1,695
1	Alw	Pump Station Piping	\$1,400.00	\$1,400	48	\$4,791
2	Ea	2 hp Piston Pumps	\$1,400.00	\$2,800	24	\$5,662
1	Alw	Pump Drives and control panel	\$6,200.00	\$6,200	32	\$11,385
1	Alw	PS Electrical Service & Lighting	\$1,400.00	\$1,400	32	\$3,920
1	Alw	Pump Station Building	\$4,000.00	\$4,000	130	\$13,298
		2 Underground Potable Water Piping		\$13,660	460	\$46,288

Quantity	Units	Description	Unit Price	Materials	Labor	Total
1	Alw	Excavation / Backfill / Piping Install	\$700.00	\$700	340	\$19,598
3600	Lf	1-1/4" Sch 80 Galv. Stl Water Pipe	\$2.20	\$7,920	90	\$17,218
180	Ea	1-1/4" Sch 80 Fittings	\$22.00	\$3,960	0	\$6,159
3600	Lf	20-mil Tape	\$0.30	\$1,080	30	\$3,313
<b>3 Upper Potable Water P.S. &amp; Tank</b>				<b>\$14,700</b>	<b>94</b>	<b>\$27,981</b>
1	Ea	10' dia x 9' tall fiberglass tank	\$10,000.00	\$10,000	16	\$16,425
2	Ea	5 Hp End Suction Pumps	\$900.00	\$1,800	8	\$3,235
1	Alw	Piping	\$600.00	\$600	32	\$2,675
1	Ea	110 Gal Hydro-pneumatic Tank	\$300.00	\$300	6	\$793
1	Ea	Pump Panel	\$1,200.00	\$1,200	8	\$2,302
1	Alw	Electrical & Instrumentation	\$800.00	\$800	24	\$2,551
<b>4 Upper Sewer P.S. &amp; Tank</b>				<b>\$9,900</b>	<b>130</b>	<b>\$22,475</b>
1	Ea	5' dia x 6' tall fiberglass tank	\$4,500.00	\$4,500	24	\$8,306
1	Alw	Interior Sewage Piping	\$200.00	\$200	16	\$1,182
1	Ea	Duplex Grinder Pump System	\$3,000.00	\$3,000	48	\$7,279
1	Ea	Grinder Pump Control Panel	\$600.00	\$600	16	\$1,804
1	Ea	2" Sewage Air/Vac	\$800.00	\$800	2	\$1,353
1	Alw	Electrical	\$800.00	\$800	24	\$2,551
<b>5 Underground Sewer Piping</b>				<b>\$4,890</b>	<b>540</b>	<b>\$37,002</b>
1	Alw	Excavation / Backfill / Piping Install	\$2,000.00	\$2,000	450	\$27,608
3600	Lf	2" SDR17 HDPE Pipe	\$0.40	\$1,440	42	\$4,526
1	Wk	HDPE Welder	\$400.00	\$400	0	\$622
1	Ea	New 48" Man Hole	\$900.00	\$900	32	\$3,142
1	Alw	Connection to Existing Manhole	\$150.00	\$150	16	\$1,104

**Construction Cost Estimate for: Summit West Utility Extensions**

	Materials	Labor	Total
1 Lower Potable Water P.S.	\$11,450	152	\$26,084
2 Underground Potable Water Piping	\$11,680	444	\$42,337
3 Upper Potable Water P.S. & Tank	\$12,700	94	\$24,870
4 Upper Sewer P.S. & Tank	\$9,900	130	\$22,475
5 Underground Sewer Piping	\$4,390	382	\$27,623

Material Cost		\$50,120	
Labor Rate, \$/hr:	\$35	\$42,070	1202
Subtotal 1		\$92,190	
Markup	25%	\$23,048	
Subtotal 2		\$115,238	
Contingency	15%	\$17,286	
Subtotal 3		\$132,523	
Sales Tax	8%	\$10,867	
<b>Total (less taxes)</b>		<b>\$143,390</b>	

Quantity	Units	Description	Unit Price	Materials	Labor	Total
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		1 Lower Potable Water P.S.		\$11,450	152	\$26,084
1	Alw	Connection to Existing Water Pipe	\$250.00	\$250	24	\$1,695
1	Alw	Pump Station Piping	\$1,400.00	\$1,400	48	\$4,791
2	Ea	2 hp Piston Pumps	\$1,400.00	\$2,800	24	\$5,662
1	Alw	Pump Drives and contol panel	\$6,200.00	\$6,200	32	\$11,385
1	Alw	PS Electrical Service & Lighting	\$800.00	\$800	24	\$2,551
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		2 Underground Potable Water Piping		\$11,680	444	\$42,337
1	Alw	Excavation / Backfill / Piping Install	\$700.00	\$700	340	\$19,598

Quantity	Units	Description	Unit Price	Materials	Labor	Total
900	Lf	Insulation Board	\$1.40	\$1,260	24	\$3,266
2700	Lf	1-1/4" Sch 80 Galv. Stl Water Pipe	\$2.20	\$5,940	60	\$12,505
135	Ea	1-1/4" Sch 80 Fittings	\$22.00	\$2,970	0	\$4,619
2700	Lf	20-mil Tape	\$0.30	\$810	20	\$2,349
<b>3 Upper Potable Water P.S. &amp; Tank</b>				<b>\$12,700</b>	<b>94</b>	<b>\$24,870</b>
1	Ea	9' dia x 9' tall fiberglass tank	\$8,000.00	\$8,000	16	\$13,314
2	Ea	5 Hp End Suction Pumps	\$900.00	\$1,800	8	\$3,235
1	Alw	Piping	\$600.00	\$600	32	\$2,675
1	Ea	110 Gal Hydro-pneumatic Tank	\$300.00	\$300	6	\$793
1	Ea	Pump Panel	\$1,200.00	\$1,200	8	\$2,302
1	Alw	Electrical & Instrumentation	\$800.00	\$800	24	\$2,551
<b>4 Upper Sewer P.S. &amp; Tank</b>				<b>\$9,900</b>	<b>130</b>	<b>\$22,475</b>
1	Ea	5' dia x 6' tall fiberglass tank	\$4,500.00	\$4,500	24	\$8,306
1	Alw	Interior Sewage Piping	\$200.00	\$200	16	\$1,182
1	Ea	Duplex Grinder Pump System	\$3,000.00	\$3,000	48	\$7,279
1	Ea	Grinder Pump Control Panel	\$600.00	\$600	16	\$1,804
1	Ea	2" Sewage Air/Vac	\$800.00	\$800	2	\$1,353
1	Alw	Electrical	\$800.00	\$800	24	\$2,551
<b>5 Underground Sewer Piping</b>				<b>\$4,390</b>	<b>382</b>	<b>\$27,623</b>
1	Alw	Excavation / Backfill / Piping Install	\$1,500.00	\$1,500	300	\$18,665
900	Lf	Insulation Board	\$1.40	\$1,260	24	\$3,266
2700	Lf	2" SDR17 HDPE Pipe	\$0.40	\$1,080	42	\$3,966
1	Wk	HDPE Welder	\$400.00	\$400	0	\$622
1	Alw	Connection to Existing Manhole	\$150.00	\$150	16	\$1,104

**Construction Cost Estimate for: Alpentel Utility Extensions**

	Materials	Labor	Total
1 Above Grade Utilities Corridor	\$186,800	1786	\$438,349
2 Lower Potable Water P.S.	\$18,550	290	\$50,462
3 Underground Potable Water Piping	\$22,360	792	\$88,053
4 Upper Potable Water P.S. & Tank	\$17,500	110	\$37,539
5 Upper Sewer P.S. & Tank	\$9,900	130	\$25,407
6 Underground Sewer Piping	\$7,330	720	\$57,196

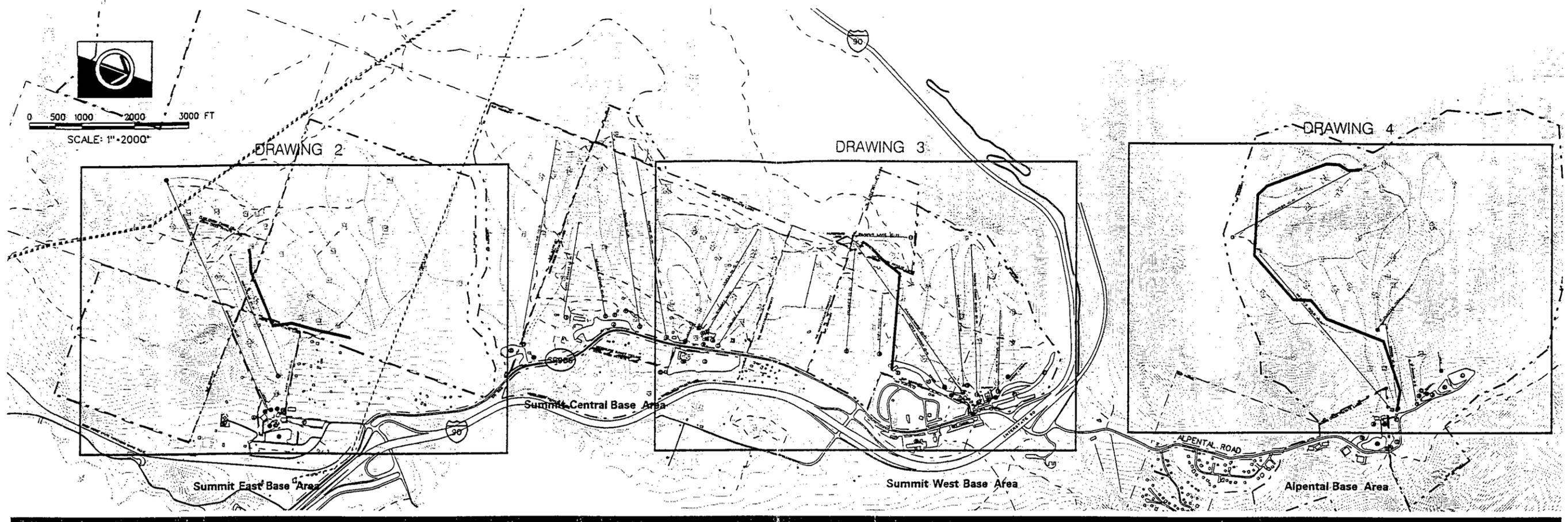
Material Cost	\$262,440
Labor Rate, \$/hr: \$35	\$133,980 3828
Subtotal 1	\$396,420
Markup 25%	\$99,105
Subtotal 2	\$495,525
Contingency 30%	\$148,658
Subtotal 3	\$644,183
Sales Tax 8%	\$52,823
<b>Total (less taxes)</b>	<b>\$697,005</b>

Quantity	Units	Description	Unit Price	Materials	Labor	Total
<b>1 Above Grade Utilities Corridor</b>				<b>\$186,800</b>	<b>1786</b>	
800 LF		3/4" Threaded Rod Supports	\$2.50	\$2,000	48	\$6,470
4 wks		Band Saw	\$35.00	\$140	12	\$985
1 Alw		Temporary Power	\$500.00	\$500	24	\$2,356
4 wks		Rotohammer & 1" Bits	\$155.00	\$620	80	\$6,013
30 Bgs		Grout	\$30.00	\$900	24	\$3,059
26880 Lbs		MC 10 x 8.4 , Galv, Fab.	\$1.50	\$40,320	320	\$90,585

Quantity	Units	Description	Unit Price	Materials	Labor	Total
21760	Lbs	1/4" x 8" FB, Galv., Fab.	\$1.50	\$32,640	200	\$69,697
1	Alw	Fasteners	\$1,200.00	\$1,200	140	\$10,725
3200	Lf	1-1/4" Sch 80 Galv. Stl Water Pipe	\$2.20	\$7,040	120	\$19,763
200	Ea	1-1/4" Sch 80 Fittings	\$22.00	\$4,400	0	\$7,736
3200	Lf	Water Pipe Heat Tape with FG tape	\$2.00	\$6,400	26	\$12,853
3200	Lf	Water Pipe Insulation * Jacket	\$4.40	\$14,080	80	\$29,679
3200	Lf	2" SDR17 HDPE Pipe	\$0.40	\$1,280	100	\$8,404
80	Ea	2" SDR17 HDPE Pipe Fittings	\$50.00	\$4,000	0	\$7,033
3200	Lf	Sewer Pipe Heat Tape with FG tape	\$2.50	\$8,000	32	\$16,035
3200	Lf	Sewer Pipe Insulation & Jacket	\$5.30	\$16,960	80	\$34,743
1	Wk	HDPE Welder	\$400.00	\$400	0	\$703
1	Alw	Heat Tape Power & Control Equip	\$2,500.00	\$2,500	40	\$6,857
2000	Lf	3/4" GRC	\$1.75	\$3,500	80	\$11,077
4000	Lf	#8 THHN Wire	\$0.20	\$800	24	\$2,884
3200	Lf	2" GRC	\$5.00	\$16,000	160	\$37,978
9600	Lf	#6 15 KV Wire	\$1.20	\$11,520	72	\$24,686
8	Ea	J-Boxes	\$150.00	\$1,200	0	\$2,110
3200	Lf	1" GRC	\$2.25	\$7,200	100	\$18,813
3200	Lf	#6 15 KV Wire	\$0.85	\$2,720	24	\$6,259
8	Ea	J-Boxes	\$60.00	\$480	0	\$844
<b>2 Lower Potable Water P.S.</b>				<b>\$18,550</b>	<b>290</b>	<b>\$50,462</b>
1	Alw	Connection to Existing Water Pipe	\$350.00	\$350	24	\$2,092
1	Alw	Pump Station Piping	\$1,400.00	\$1,400	48	\$5,415
2	Ea	10 hp Piston Pumps	\$2,000.00	\$4,000	24	\$8,510
1	Alw	Pump Drives and contol panel	\$7,400.00	\$7,400	32	\$14,980

Quantity	Units	Description	Unit Price	Materials	Labor	Total
1	Alw	PS Electrical Service & Lighting	\$1,400.00	\$1,400	32	\$4,431
1	Alw	Pump Station Building	\$4,000.00	\$4,000	130	\$15,033
<b>3 Underground Potable Water Piping</b>				<b>\$22,360</b>	<b>792</b>	<b>\$88,053</b>
1	Alw	Excavation / Backfill / Piping Install	\$1,500.00	\$1,500	600	\$39,561
2400	Lf	Insulation Board	\$1.40	\$3,360	32	\$7,877
4800	Lf	1-1/4" Sch 80 Galv. Stl Water Pipe	\$2.20	\$10,560	120	\$25,952
250	Ea	1-1/4" Sch 80 Fittings	\$22.00	\$5,500	0	\$9,670
4800	Lf	20-mil Tape	\$0.30	\$1,440	40	\$4,993
<b>4 Upper Potable Water P.S. &amp; Tank</b>				<b>\$17,500</b>	<b>110</b>	<b>\$37,539</b>
1	Ea	11' dia x 9' tall fiberglass tank	\$12,500.00	\$12,500	16	\$22,963
1	Alw	Transporting Tank	\$300.00	\$300	16	\$1,512
2	Ea	5 Hp End Suction Pumps	\$900.00	\$1,800	8	\$3,657
1	Alw	Piping	\$600.00	\$600	32	\$3,024
1	Ea	110 Gal Hydro-pneumatic Tank	\$300.00	\$300	6	\$897
1	Ea	Pump Panel	\$1,200.00	\$1,200	8	\$2,602
1	Alw	Electrical & Instrumentation	\$800.00	\$800	24	\$2,884
<b>5 Upper Sewer P.S. &amp; Tank</b>				<b>\$9,900</b>	<b>130</b>	<b>\$25,407</b>
1	Ea	5' dia x 6' tall fiberglass tank	\$4,500.00	\$4,500	24	\$9,389
1	Alw	Interior Sewage Piping	\$200.00	\$200	16	\$1,336
1	Ea	Duplex Grinder Pump System	\$3,000.00	\$3,000	48	\$8,229
1	Ea	Grinder Pump Control Panel	\$600.00	\$600	16	\$2,040
1	Ea	2" Sewage Air/Vac	\$800.00	\$800	2	\$1,530
1	Alw	Electrical	\$800.00	\$800	24	\$2,884
<b>6 Underground Sewer Piping</b>				<b>\$7,330</b>	<b>720</b>	<b>\$57,196</b>
1	Alw	Excavation / Backfill / Piping Install	\$1,500.00	\$1,500	600	\$39,561

Quantity	Units	Description	Unit Price	Materials	Labor	Total
2400	Lf	Insulation Board	\$1.40	\$3,360	32	\$7,877
4800	Lf	2" SDR17 HDPE Pipe	\$0.40	\$1,920	72	\$7,807
1	Wk	HDPE Welder	\$400.00	\$400	0	\$703
1	Alw	Connection to Existing Manhole	\$150.00	\$150	16	\$1,248



INDEX OF DRAWINGS

<u>Drawing No</u>	<u>Description</u>
1	Cover Sheet
2	Summit East Pipeline - Plan
3	Summit West Pipeline - Plan
4	Alpental Pipeline - Plan
5	Pipeline Profiles
6	Details

# THE SUMMIT at Snoqualmie

Drawings for the Feasibility Study

## THE SUMMIT Future Restaurant Utility Extensions

August 2000

NOT FOR CONSTRUCTION

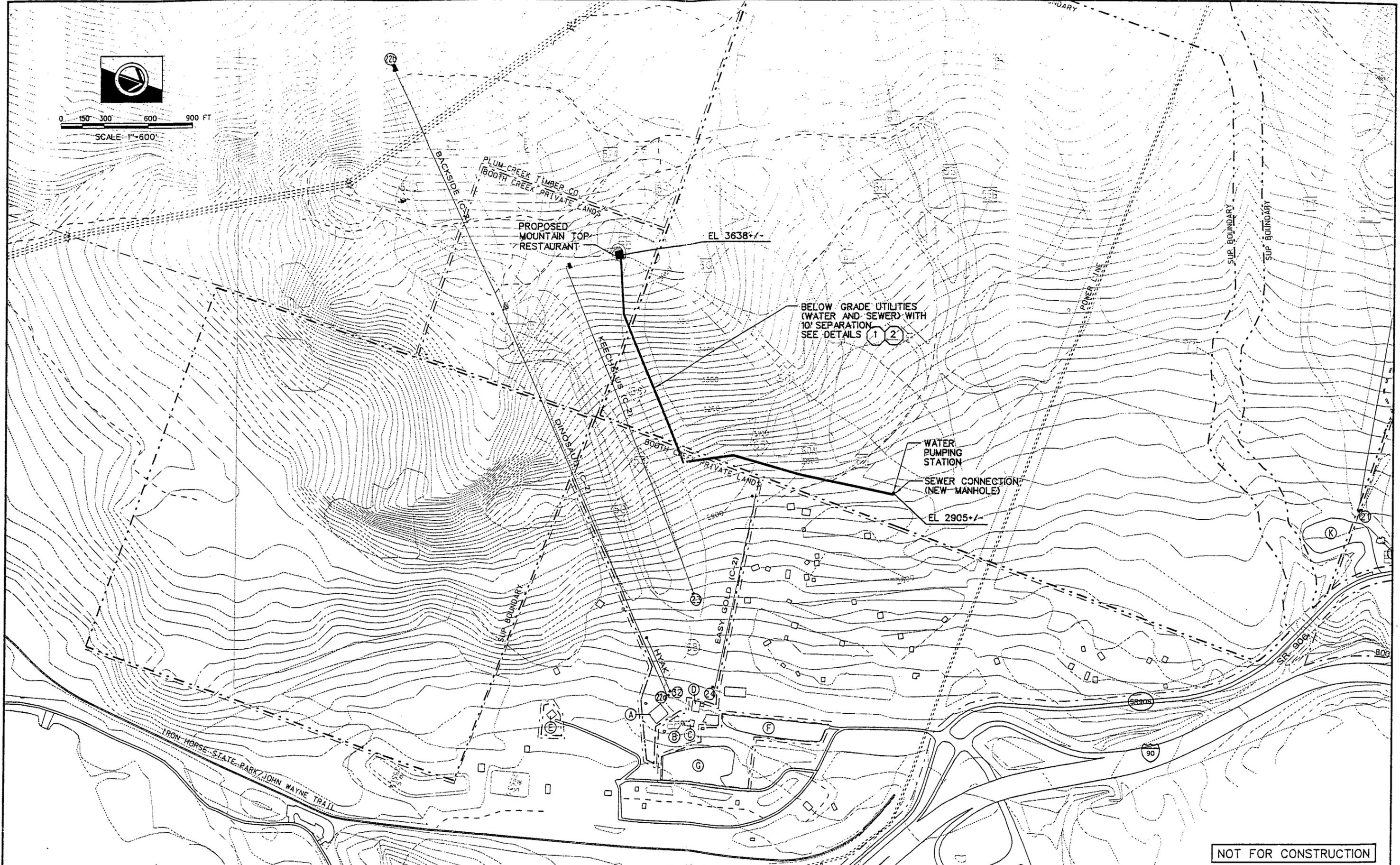
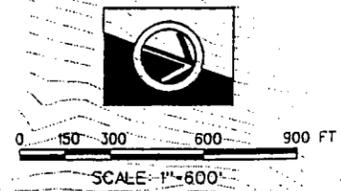


**MONTGOMERY WATSON**

Bellevue, Washington



**THE SUMMIT**  
AT SNOQUALMIE



BELOW GRADE UTILITIES  
(WATER AND SEWER) WITH  
10' SEPARATION  
SEE DETAILS 1 2

WATER  
PUMPING  
STATION  
SEWER CONNECTION  
(NEW MANHOLE)  
EL 2905+/-

NOT FOR CONSTRUCTION

Job No. 1060122.012509 File: g:\thesummit\atnaqualmie\design\drawings\civil\poadwg02.dgn Plot Date: 07-SEP-2008 14:28

REV	DATE	BY	DESCRIPTION

SCALE  
1"=600'

**WARNING**  
0 1/2  
IF THIS BAR DOES NOT MEASURE 1/2" THEN DRAWING IS NOT TO SCALE

DESIGNED F POSTLEWATE  
DRAWN J SCHULZ  
CHECKED P BURKE

SUBMITTED BY \_\_\_\_\_  
LICENSE NO. \_\_\_\_\_ DATE \_\_\_\_\_  
LICENSE NO. \_\_\_\_\_ DATE \_\_\_\_\_



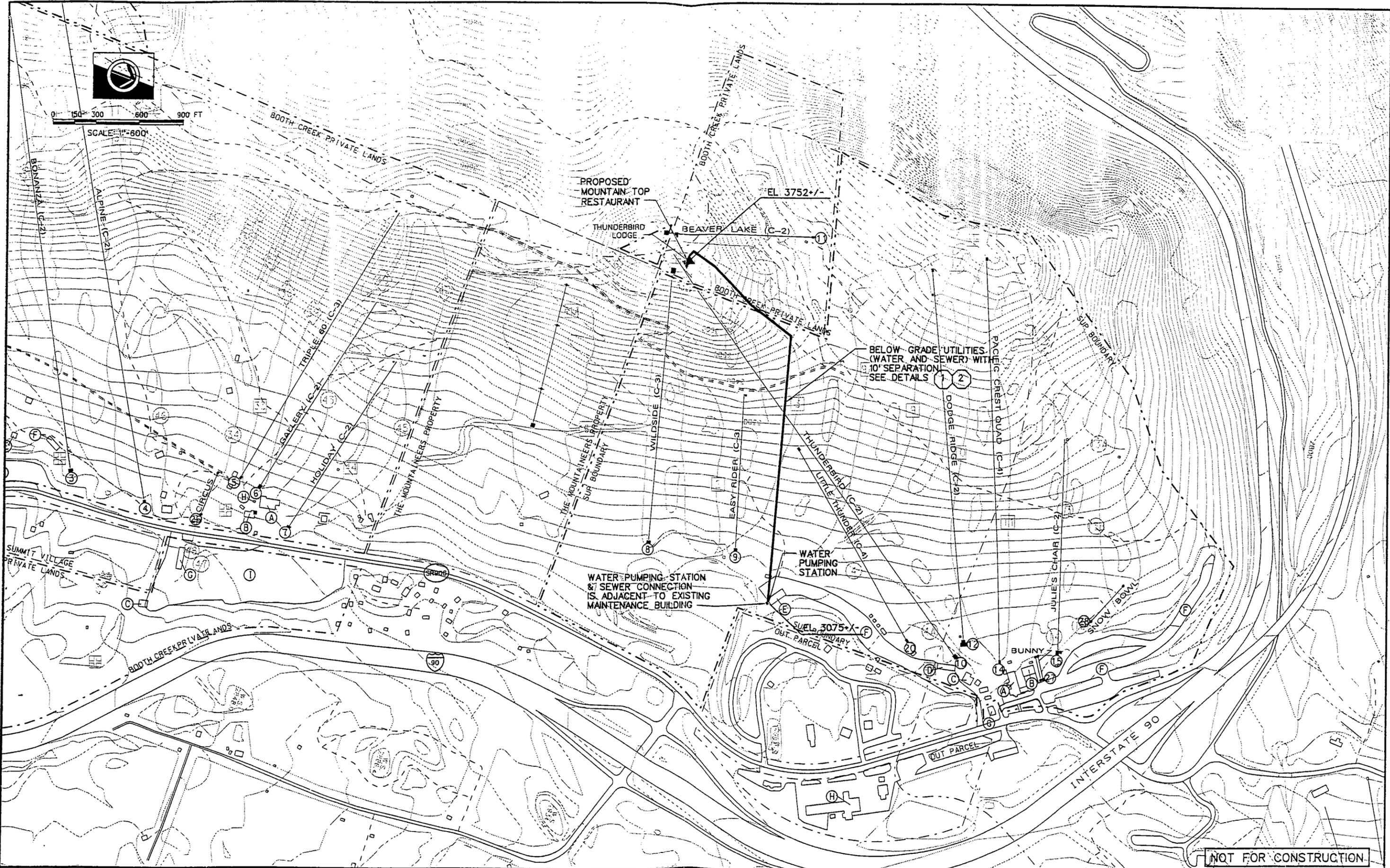
**MONTGOMERY WATSON**  
Bellevue, Washington

THE SUMMIT  
at Snoqualmie  
FUTURE RESTAURANT UTILITY EXTENSIONS

SUMMIT EAST PIPELINE  
PLAN

DRAWING  
2

Job No. 1060122\_012509 File: j:\the summit at snoqualmie\design\drawings\civil\pasdwg03.dgn Plot Date: 07-SEP-2008 14:20



NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE 1"=600'	WARNING 0 1/2 IF THIS BAR DOES NOT MEASURE 1/2" THEN DRAWING IS NOT TO SCALE	DESIGNED F POSTLEWATE DRAWN J SCHULZ CHECKED P BURKE
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SUBMITTED BY	LICENSE NO.	DATE
	LICENSE NO.	DATE

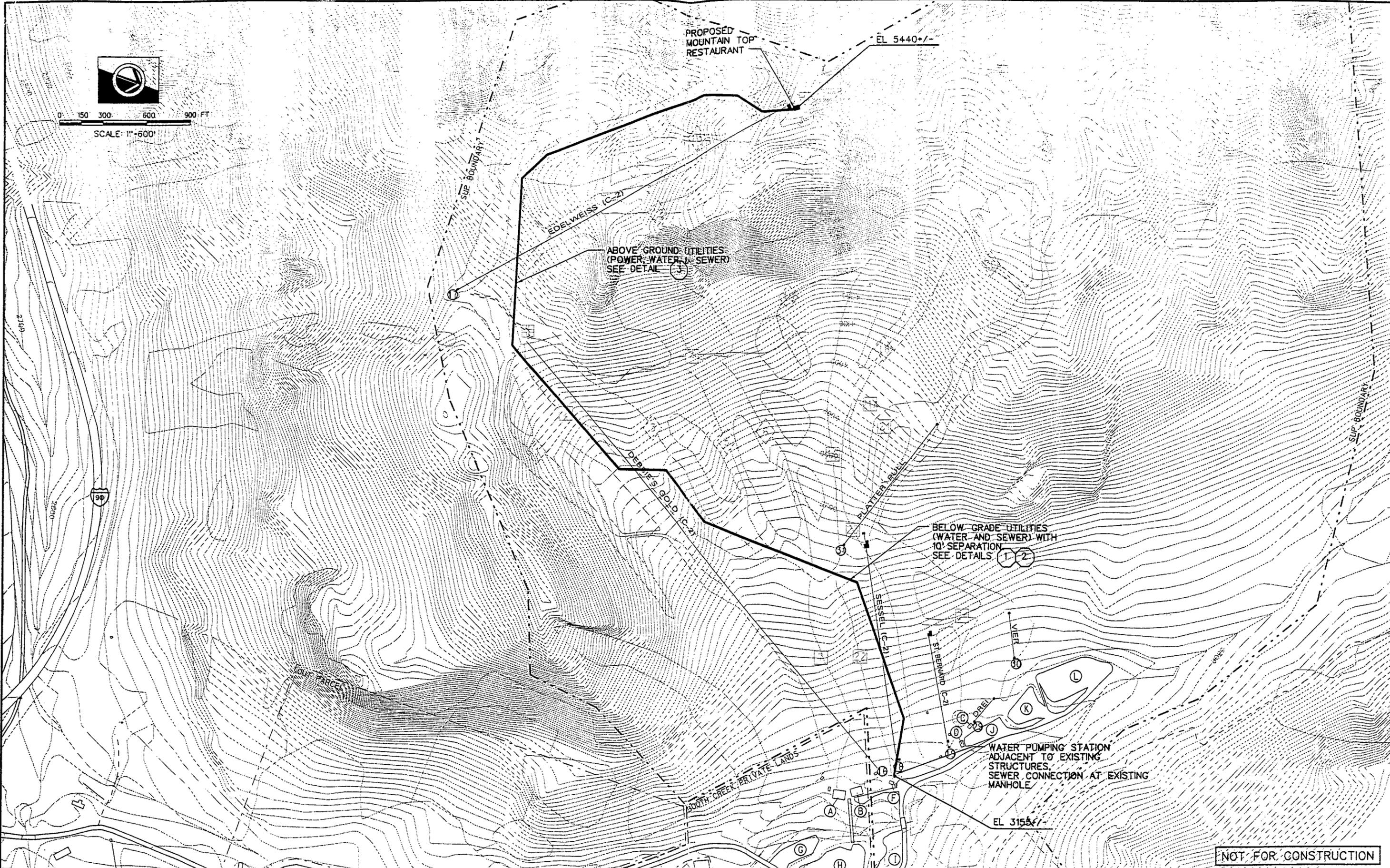

**MONTGOMERY WATSON**  
 Bellevue, Washington

THE SUMMIT  
 at Snoqualmie  
 FUTURE RESTAURANT UTILITY EXTENSIONS

SUMMIT WEST PIPELINE  
 PLAN

DRAWING  
 3

Job No. 1060122.012509 File: g:\thesummit\snog\mtd\design\drawings\civ\posdwg04.dgn Plot Date: 07-SEP-2000 14:21



REV	DATE	BY	DESCRIPTION

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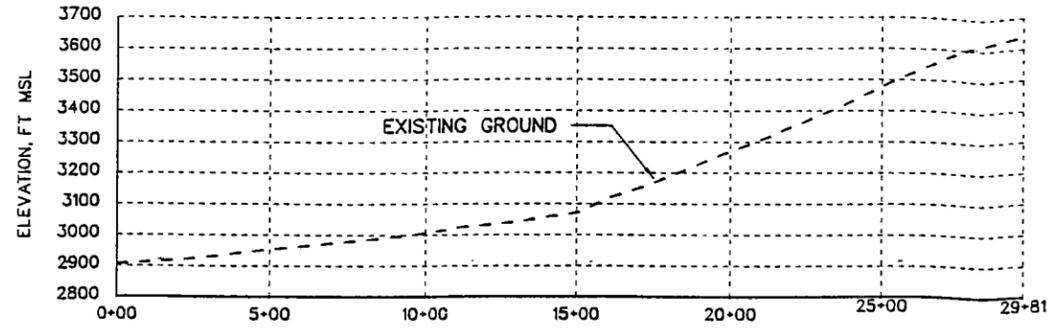
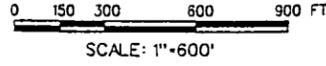
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	LICENSE NO.	DATE


**MONTGOMERY WATSON**  
 Bellevue, Washington

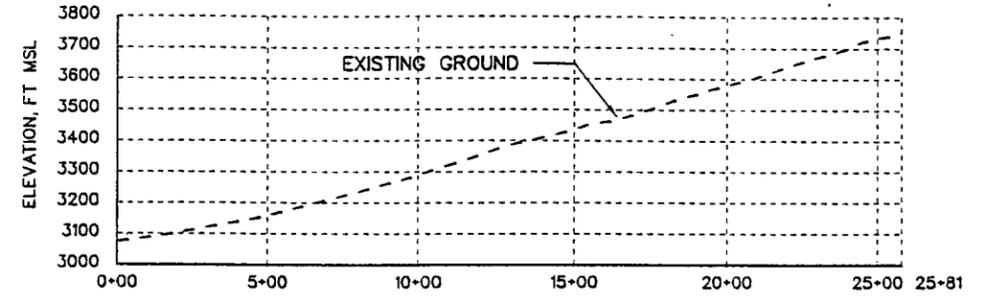
THE SUMMIT  
 at Snoqualmie  
 FUTURE RESTAURANT UTILITY EXTENSIONS

ALPENTAL PIPELINE  
 PLAN

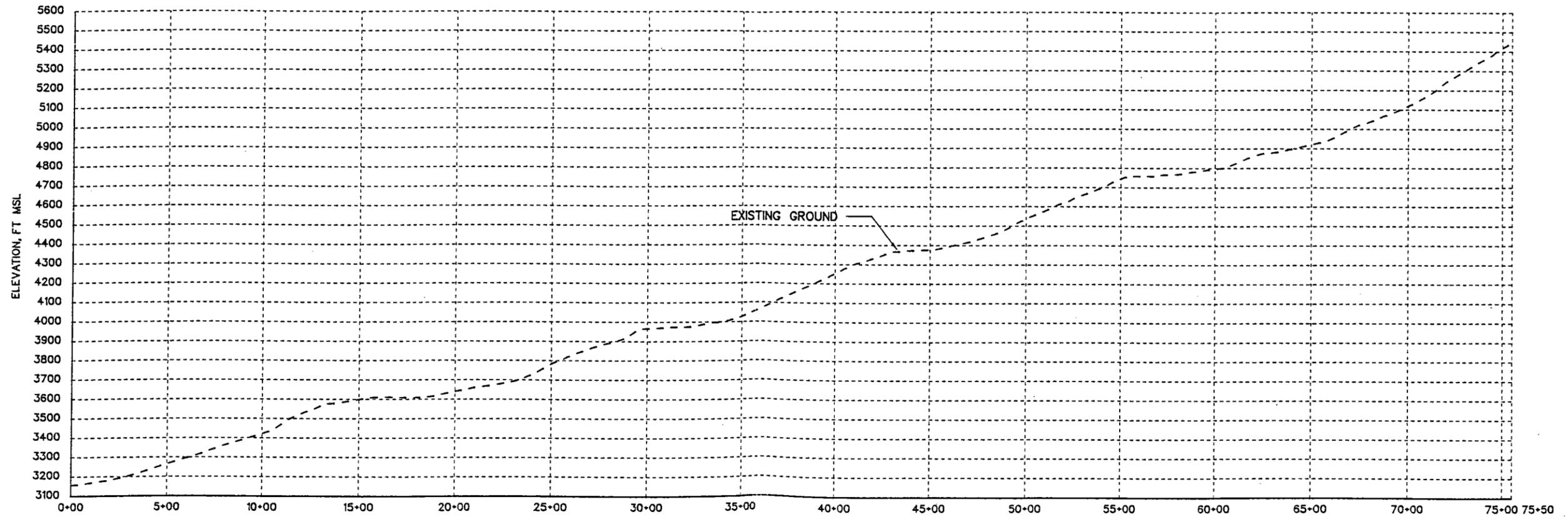
DRAWING  
**4**



SUMMIT EAST PIPELINE PROFILE



SUMMIT WEST PIPELINE PROFILE



ALPENTAL PIPELINE PROFILE

NOT FOR CONSTRUCTION

Plot Date: 07-SEP-2009 14:21

Job No. 1001022.012509 File: g:\thesummit\snoqualmie\design\drawings\city\pasdwg05.dgn

REV	DATE	BY	DESCRIPTION

SCALE 1"=600'	<b>WARNING</b>  IF THIS BAR DOES NOT MEASURE 1/2" THEN DRAWING IS NOT TO SCALE
DESIGNED F. POSTLEWATE	SUBMITTED BY
DRAWN J. SCHULZ	LICENSE NO. DATE
CHECKED P. BURKE	LICENSE NO. DATE



**MONTGOMERY WATSON**

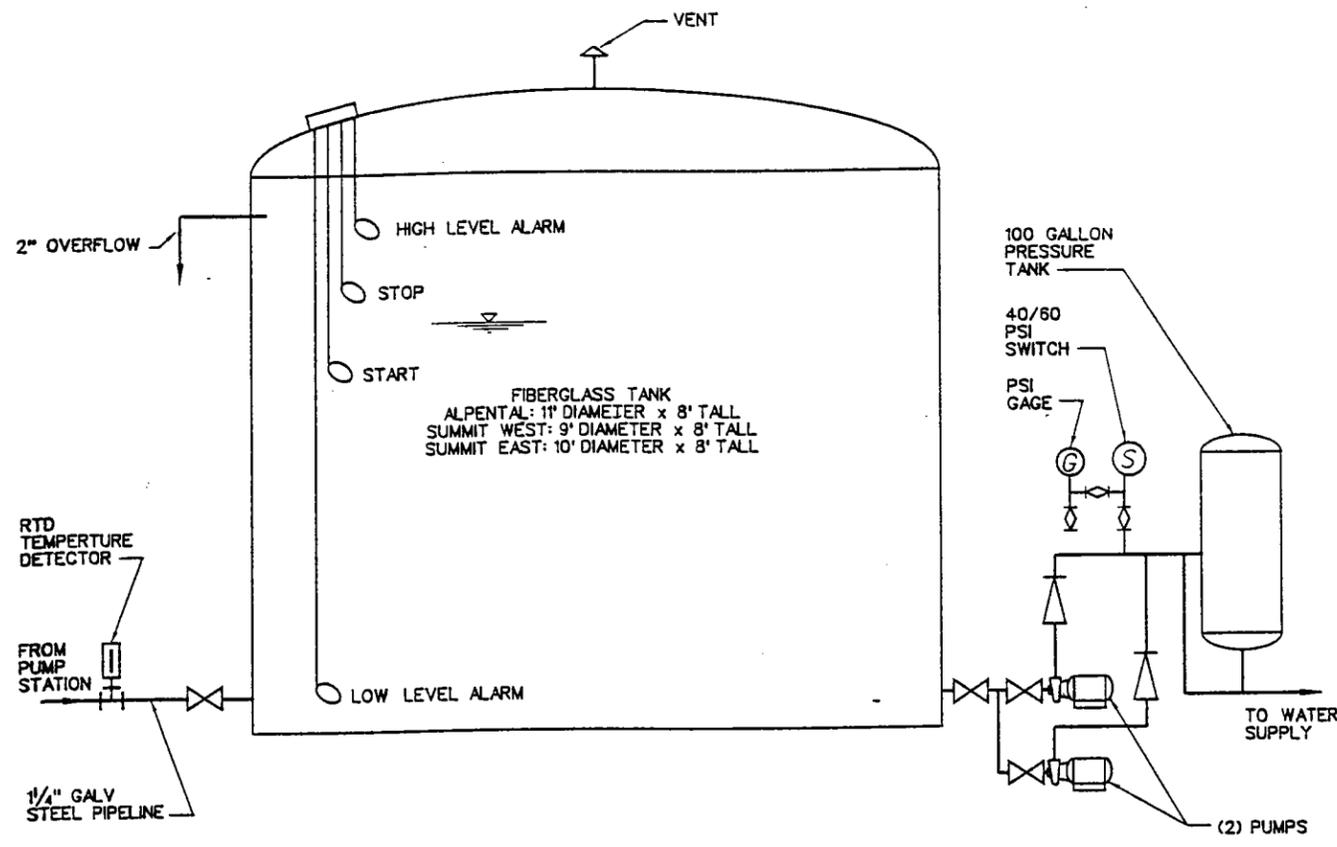
Bellevue, Washington

THE SUMMIT  
at Snoqualmie  
FUTURE RESTAURANT UTILITY EXTENSIONS

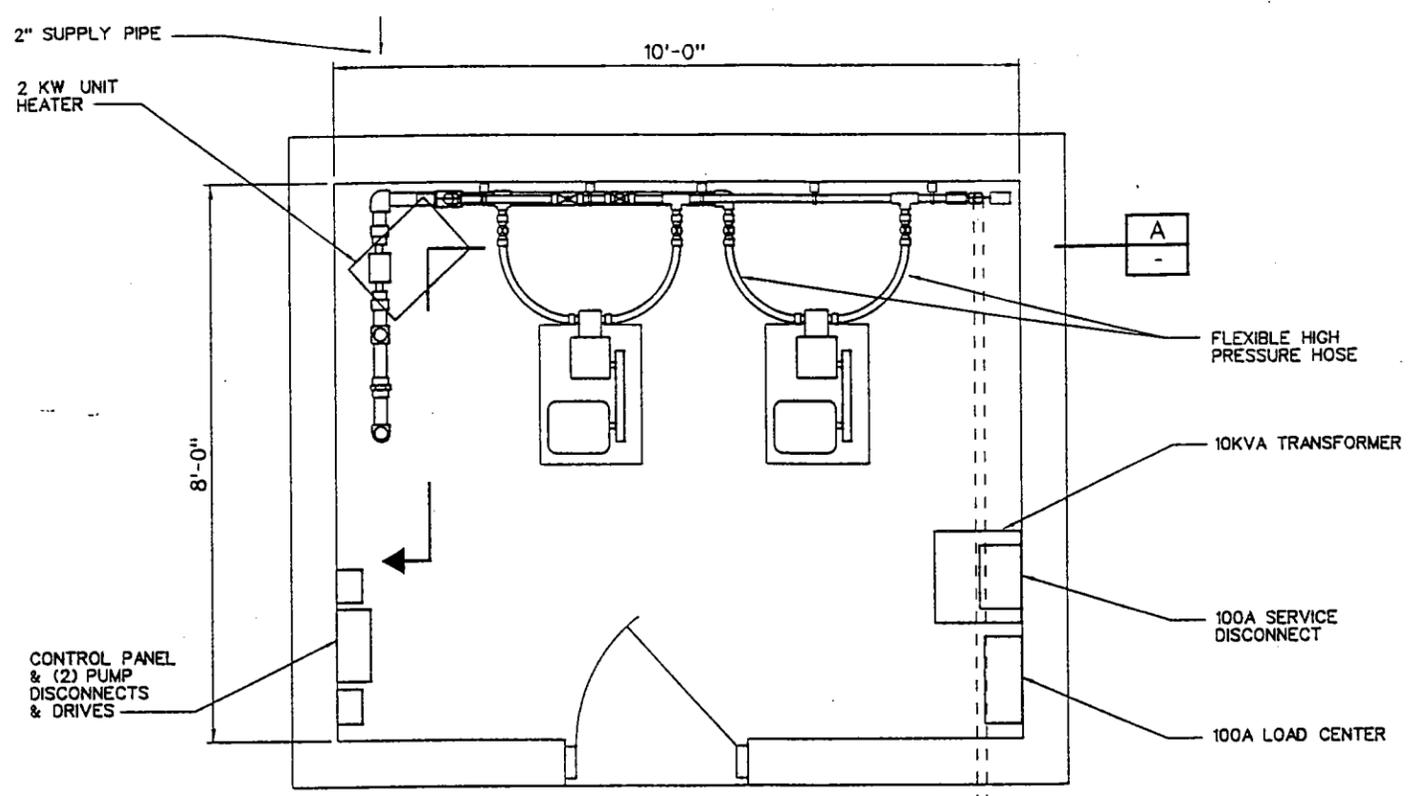
PIPELINE  
PROFILES

DRAWING

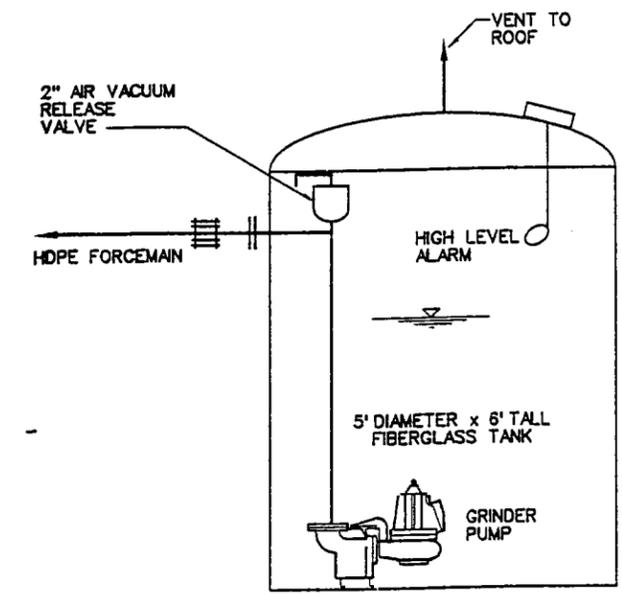
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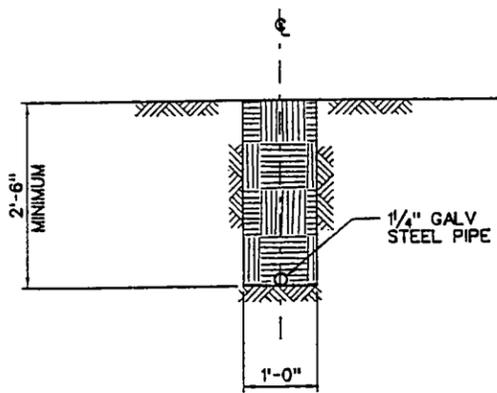
**POTABLE WATER TANK AND PRESSURE SYSTEM**  
(LOCATED AT RESTAURANT SITE)



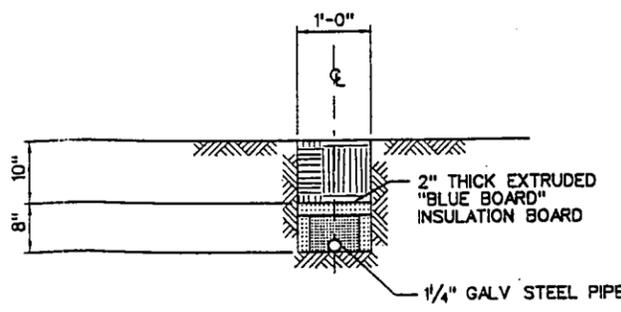
**TYPICAL POTABLE WATER PUMP STATION PLAN**  
(LOCATED IN BASE AREAS)



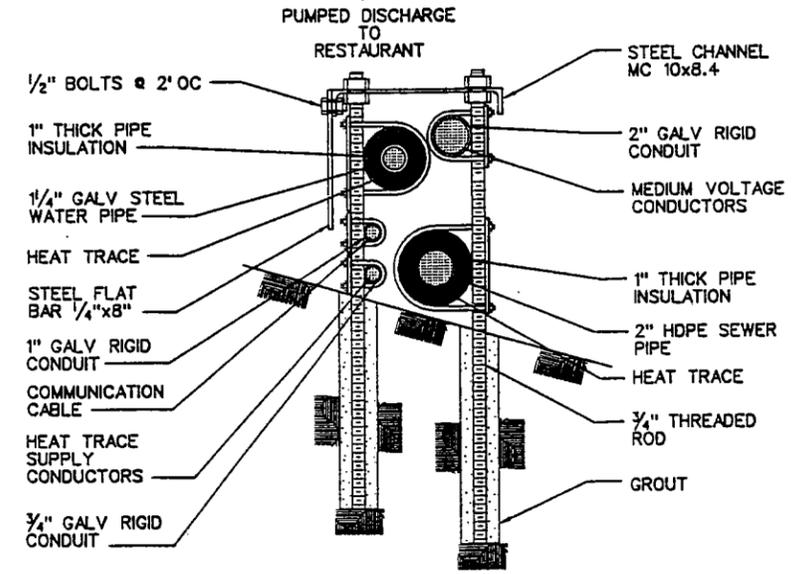
**WASTEWATER SYSTEM**  
(LOCATED AT RESTAURANT SITE)



**TYPICAL TRENCH SECTION 1**  
SCALE: NONE



**TRENCH SECTION WHERE MINIMUM COVER NOT ATTAINABLE 2**  
SCALE: NONE



**TYPICAL ABOVE GROUND UTILITY CORRIDOR SECTION 3**  
SCALE: NONE

**NOT FOR CONSTRUCTION**

Job No. 1060122.012509 File: g:\thesummit\atanoqualmie\design\drawings\civil\psdwg06.dgn Plot Date: 07-SEP-2000 14:19

REVISIONS	SCALE	WARNING	DESIGNED	SUBMITTED BY
	AS SHOWN	IF THIS BAR DOES NOT MEASURE 1/2" THEN DRAWING IS NOT TO SCALE	F. POSTLEWATE	
			J. SCHULZ	LICENSE NO.    DATE
			P. BURKE	LICENSE NO.    DATE

<p><b>MONTGOMERY WATSON</b> Bellevue, Washington</p>	<p>THE SUMMIT at Snoqualmie FUTURE RESTAURANT UTILITY EXTENSIONS</p>	<p>DETAILS</p>	<p>DRAWING 6</p>
	<p><b>NOT FOR CONSTRUCTION</b></p>		