APPENDIX P

PARKING LOT #5 CONSTRUCTION POLLUTION PREVENTION PLAN
(includes grading, erosion control and stormwater management plans)

Notice of Intent ("NOI")

New York State Department of Environmental Conservation

Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NOTICE OF INTENT for Stormwater Discharges Associated with Construction Activity UNDER SPDES GENERAL PERMIT #GP-02-01

NYR _ _ _ _ _ _
(for DEC use only)

IMPORTANT: **All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this general permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan (SWPPP) prior to completing and submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.**

Section I. Applicant/Activity Information

1. Owner/Operator Name: Olympic Regional Development Authority/Whiteface Mountain Ski Center

2a. Mailing Address: 218 Main Street	2b. City Lake Placid	2c. State NY	2d. Zip 12946-0000
3. Contact Person: 3a. First Name: Jay 3b. Last Name: Rand (@ Whiteface Mountain)	3c. Phone: (518) 946-4201	3d. E-mail: jrand@whiteface.com	
4a. Site/Project Name: Whiteface Mountain Parking Lot #5		4b. Existing use of the site: ski area	
5a. Street Address: Route 86	5b. City: Wilmington	State: NY	5c. Zip 12997-0000
6. County: Essex	7. Site Location: 7a. X Coordinates: 73.8565	7b. Y coordinates: 44.3587	

Section II. Disturbance Activity/Discharge Characteristics

8. Future use of the site: ski area	9. Duration of disturbance activity (use mm/dd/yyyy) from: 08/01/2003 to: 12/01/2003
10. Total site acreage: 2,500.00 (acres)	11. Total acres of disturbed area of overall plan of development or sale: 06/17/2003
12. Soil (Hydrologic Soil Group): C	13. What is the maximum slope of disturbed area: % 20.00

14. What is the percentage of impervious area of the site? 14a. before commencement of the project % 0.00
14b. after completion of the project % 19.00

15. Will there be permanent stormwater management practices? ☑ yes ☐ no
16. Is this a phased project? ☐ yes ☑ no

Section III. Receiving System(s)

17. Does any part of the project lie within a regulated 100-year flood plain? ☐ yes ☑ no
18. Does the site/activity lie within the boundaries of the New York City watershed? ☐ yes ☑ no
19. Does runoff from site enter a storm sewer or ditch maintained by a local, Federal or State governmental unit (MS4)? ☐ yes ☑ no
If the answer to 19 is no, skip to question 20.
19a. Provide the name of the government owning the storm sewer system: _____
19b. Is the MS4 a "regulated MS4" as defined under 40 CFR Section 122.32? ☐ yes ☐ no ☐ don't know
19c. Does the MS4 have a SPDES permit for their storm sewer system? ☐ yes ☐ no ☐ don't know
19d. Is the runoff from the site tributary to a Combined Sewer Overflow (CSO)? ☐ yes ☐ no
20. What is the name of the nearest surface water body into which the runoff will enter?: West Branch AuSable River
21. Does the runoff discharge to a receiving water identified as 303(d) listed segment ☐, or "TMDL" water ☐, or neither ☑?

Section IV. Stormwater Pollution Prevention Plan:

22. What components are required for the SWPPP? (Consult the SWPPP and Stormwater Permit Process flow chart and check all that apply): 22a. ☑ Erosion and Sediment Control Plan 22b. ☑ Water Quality and Quantity Controls

23. Is the Construction Sequence Schedule for the planned management practices prepared? ☑ yes ☐ no

Will the Stormwater Pollution Prevention Plan be in conformance with:
24a. local government requirements? ☑ yes ☐ no 24b. NYSDEC requirements? ☑ yes ☐ no
If the answer to 24b. is yes, skip to Section VI.

Section V. Supplemental Information (only if you answered "no" to question 24 b.)

25. **Before submitting this NOI, you must have your SWPPP certified by a licensed Professional.**
This certification must state that the SWPPP has been developed in a manner which will enssure compliance with water quality standards and with the substantive intent of this permit (see general permit for additional information).
Is your plan certified by a licensed Professional? ☐ yes ☐ no

- Do not submit your SWPPP to DEC unless requested.
- A copy of your SWPPP must be submitted to the local jurisdiction(s) as required under Part III, subsection B.2 (also see question #29 below).
- State each deviation from the Department's Technical Standards, reasons supporting each deviation request and an analysis of the water quality impacts in your SWPPP.
- Use Section VII below to summarize the justification statement in one paragraph.
- Allow sixty (60) days from the receipt of your completed application for permit coverage to provide DEC an opportunity to review the application and supporting information.

Section VI. Reviews and Approvals

Has your SWPPP been reviewed by: 26a. ☐ local Soil and Water Conservation District 26b. ☐ Professional Engineer
26c. ☑ Certified Professional Erosion Control Specialist 26d. ☑ Licensed Landscape Architect. 26e. ☐ None

27. Are there other DEC permits required or already obtained for this project? ☐ yes ☑ no
28. If the answer to 27 is no, skip to question 29.
28a. If this NOI is submitted for the purpose of continuing previous coverage under the general permit for stormwater runoff from construction activities (GP-93-06), please indicate the SPDES reference number assigned under GP-93-06: NYR1 0B109
28b. If there is another SPDES permit, please indicate the permit number: NY _____
28c. If there are other DEC permits, please provide one of the permit numbers: _____

29. Has a copy of your SWPPP been submitted to the governing jurisdiction as required by the permit? ☑ yes ☐ no

Section VII. Details (use this space, maximum of 650 characters, to further explain answers where necessary)

The proposed action consistes of constructing a new parking lot, Lot #5, at Whiteface Mountain. The gravel/stone surface lot will provide needed additional skier parking. Access to the new lot will be via and existing drive and parking lot. A sediment and erosion control plan has been prepared that includes temporary and permanent controls. Permaneant stormwater quality and quantity controls will be provided via a Micropool Extended Detention Pond.

Section VIII. Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I also certify under penalty of law that this document and the corresponding documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction. and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

30a. Printed Name:	30b. Title/Position:	30c. Phone:
Signature:	30d. E-mail:	30e. Date:

Reset All Fields

Stormwater Pollution Prevention Plan

Whiteface Mountain Parking Lot #5

Prepared By
The LA Group, P.C.
40 Long Alley
Saratoga Springs, NY 12866
Ph. (518) 587-8100

Owner
Olympic Regional Development Authority
218 Main Street
Lake Placid, NY 12946
Ph. (518) 523-1665

July 2003

PREPARER CERTIFICATION OF COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

This Construction Pollution Prevention Plan was prepared in accordance with the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-02-01), pursuant to Article 17, Titles 7, 8 and Article 70 of the Environmental Conservation Law. This SPDES General Permit implements the Federal Clean Water Act pertaining to stormwater discharges.

Construction will begin only after the requirements of SEQRA are met and any necessary Federal, State and local permits are issued.

Signature: _____

Name: _____

Title: _____

Date: _____

OWNER POLLUTION PREVENTION PLAN CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Signature: _____

Name: DANIEL P. SHEEHAN

Title: REGISTERED LANDSCAPE ARCHITECT NYS# 001171

Date: 4-28-04

CONTRACTOR AND SUBCONTRACTOR CERTIFICATION

I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction site identified in such SWPPP as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards.

Signature: _____

Company: _____

Responsible For: _____

Date: _____

Signature: _____

Company: _____

Responsible For: _____

Date: _____

Signature: _____

Company: _____

Responsible For: _____

Date: _____

Stormwater Pollution Prevention Plan

1. Regulatory Information

This Stormwater Pollution Prevention Plan (SWPPP) is prepared to inform the landowner and construction personnel of the measures to be implemented for controlling runoff and pollutants from the site during and after construction activities. The objective of this plan is to comply with the New York Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities, Permit No. GP-02-01 requirements. Any materials conflicts between this plan and the site plans, specification or instructions, must be brought to the attention of the design professional. The project may have other permits and it is the responsibility of the owner and contractor to know and understand all permits.

2. Project Information

Name Parking Lot #5 Whiteface Mountain
Location NY Route 86, T/O Wilmington, Essex County

3. Owner Information

Name Olympic Regional Development Authority
Address 218 Main Street, Lake Placid, NY 12946
Phone number 523-1655
email address bhammond@orda.org

4. SWPPP Review, Update

a. SWPPP Review

Applicable Federal, State, and local regulatory agencies that have jurisdiction may elect to review this SWPPP and notify the permittee in writing that the SWPPP does not meet the requirements of their regulations. If the SWPPP needs to be revised, the permittee and the site contractor will make the required modifications within seven days of such notification and submit written certification to the notifying agency that the changes have been implemented. A copy of the SWPPP will be kept available on site for review by regulatory agencies, engineers, and subcontractors.

b. SWPPP Update

The permittee identified in this SWPPP may amend the SWPPP when there is a change in one or more of the following project components which has an affect on the potential for discharge of pollutants from stormwater runoff associated with construction activities:

- Design
- Construction
- Operation
- Maintenance

The SWPPP shall also be updated or amended under the following conditions:

- If measures identified in the SWPPP become ineffective in eliminating or minimizing pollutants from sources identified, or in achieving the general objectives of controlling stormwater pollution from permitted construction activity.
- To identify a new subcontractor that will implement any part of the SWPPP.

5. Site Description

a. Project Description

i. Background Information and Pre-development Conditions

Whiteface Mountain is in need of additional public parking spaces to meet skier needs. A new parking lot, lot #5, is proposed to be constructed off of the existing internal roadway that currently provides access to parking lot #4. The area where parking lot #5 will be constructed is currently a mix of undeveloped wooded areas, an existing bike trail, and an open field area that contains an existing small outbuilding utilized by Whiteface.

ii. Scope of the Project

The project consists solely of the construction of parking lot #5, two short access drives off of the existing internal road and lot #4, and construction of the stormwater management basin (micropool extended detention pond). The gravel-surfaced parking lot is approximately 2.44 acres. The total area of proposed disturbance is approximately 6 acres.

b. Construction Sequence

Construction Activities (Identify name of planned practices)	Reference Sheet Number	Start → Stop
1. Install Downhill Work Limit Erosion Control		
Beginning at the existing bike path install silt fencing at the lower limit of construction disturbance. Clear a "work road" approximately 10 feet wide along the downhill disturbance limit. Install sections of silt fence at the downhill edge of disturbance and on the contours so that silt fence sections are not running uphill or downhill.		
Because the downhill edge of disturbance is not on the same contour, in some instances silt fence will not be continuous but will need to be staggered. When viewed from uphill there shall be overlap and no gaps between the sections of staggered silt fence.		
The northern 2/3 can be one continuous run of silt fence along the 1300 foot contour with ends of adjoining silt fence sections properly secured to the same post.	1 & 2	
If possible, the area of silt fence installation should include the existing bike path. However, if it is necessary to keep the existing bike path passable during construction, install a water bar across the bike trail just downhill of the work limit. The gap in the silt fence for the bike trail shall be as narrow as practical. At the end of each work day a row of hay bales shall be installed across the bike trail to span the gap in the silt fence.		
Temporarily stabilize the disturbed "work road" by seeding with ryegrass (annual rye is acceptable) at a rate of 4 pounds per 1,000 square feet.		

2. Improve/Construct Upper Driveway/Construction Access Road	
Cut and grub the areas that need to be cleared for upper driveway from Lot 4. Install silt fences along downhill edge. Grade driveway, including installation of 24 feet of 12" CMP culvert. Install flared end section and rip rap outfall at culvert (see detail). Surface driveway with six inches of bank run gravel or other appropriate crushed stone surface on top of geotextile fabric. Stabilize disturbed areas outside the limits of the driveway by seeding with the Adirondack Seed Mix at a rate of 5 pounds per 1,000 square feet. Mulch seeded areas with straw at a rate of 3 bales per thousand square feet. Anchor mulch in place by crimping with tracked vehicle driven up and down the mulched area slope or other suitable physical means, or secure with non-asphaltic tackifier.	1 & 2
3. Install Culvert Under Bike Path	
Install 16 foot 12" CMP culvert under bike path as shown, including flared end section and rip rap outfall. Backfill culvert with excavated materials. Remove any excess backfill material to an area already protected by silt fence. Stabilize disturbed areas outside the limits of the bike path by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet. Mulch seeded areas with straw at a rate of 3 bales per thousand square feet. Anchor mulch in place by crimping with tracked vehicle driven up and down the mulched area slope or other suitable physical means, or secure with non-asphaltic tackifier.	1 & 2

4. Install Diversion Swale Uphill Side of Parking Lot

Construct the drainage swale that will divert runoff from uphill around the parking lot. Clear and grub the area to be disturbed uphill of the parking lot. Grade the area uphill of the parking lot to final grades. (Fine grading of the diversion swale itself should be done after the uphill area is graded and stabilized.) Immediately after grading this area stabilize by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet. Mulch seeded areas with straw at a rate of 3 bales per thousand square feet. Anchor mulch in place by crimping with tracked vehicle driven up and down the mulched area slope or other suitable physical means, or secure with non-asphaltic tackifier.

Fine grade diversion swale making sure to create positive grades from the high point. Seed the diversion swale with the Adirondack Seed Mix at a rate of 5 pounds per acre. Line bottom of diversion swale with suitable erosion control blanket such as North American Green S75®, American Excelsior Curlex 1® or suitable equivalent. Install riprap level spreader on north side of parking lot. 1 & 2

In order to grade in the swale it may be necessary to clear and grub the upper portion of the parking lot. Care should be taken to clear and grub only that portion of the parking lot absolutely necessary to grade the diversion swale. Any area of the parking lot that is cleared and grubbed for swale construction, but will remain undisturbed for a period of more than fourteen days, shall be temporarily stabilized by seeding with ryegrass at a rate of 4 pounds per 1,000 square feet (annual ryegrass is acceptable).

5. Grade Detention Basin and Area Downhill	
Excavate detention basin and grade slopes downhill to the previously installed silt fence. Stabilize all disturbed areas by seeding with Adirondack Mix at a rate of 5 pounds per 1,000 square feet and mulch with straw at a rate of 3 bales per thousand square feet. Install detention basin outlet structure (see attached detail). Temporarily block off the outlet structure holes so that detention basin will collect and hold any runoff. Install detention basin outlet pipe and level spreader. Repair any previously stabilized areas that were disturbed by reseeding and mulching at the same rates given above. Keep outlet structure holes blocked until parking lot construction is complete and surface is stabilized.	1 & 2
6. Construct Remainder of Parking Lot	
Clear and grub remaining area of parking lot. Final grade parking lot including surfacing with bank run gravel or appropriate crushed stone on top of geotextile fabric. Stabilize all disturbed areas outside the limits of the parking lot by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet. Mulch all seeded areas with straw at a rate of 3 bales per thousand square feet. After stabilization of the parking lot area is complete open detention basin outlet structure holes.	1 & 2
7. Construct Lower Driveway	
Clear and grub lower driveway installing silt fence at downhill side as shown. Install 12" 24 foot CMP culvert with flared end section and riprap outfall. NOTE: This culvert shall be installed only when there is no flow in the drainage in which it is placed ("in the dry"). Backfill culvert, install geotextile and surface driveway with bank run gravel or suitable crushed stone. Permanently stabilize all other disturbed areas along the driveway by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet and mulching with straw at the rate of 3 bales per thousand square feet.	1 & 2

c. Receiving Water(s) (include identification of any TMDL or 303(d) waters)

West Branch AuSable River

d. Soils (include general description and Hydrologic Soil Group)

Becket Bouldery Fin Silt Loam and Skerry Bouldery Silt Loam, both Hydrologic Group C Soils

e. Attachments – considered part of this SWPPP

These documents include plans, details, and technical specifications that include, but are not limited to, the following (unless otherwise specified, these documents have been prepared by The LA Group, P.C.):

- General site map.
- Construction drawings, Sheets 1 and 2.
- Phasing plan, on Sheet 1.
- Grading plans with existing and proposed contours that indicate slopes and drainage patterns prior to and after the grading activities on Sheet 1 and attached Stormwater Management Report.
- Location of sediment and erosion control devices, catch basins, etc. that will be or have been implemented, Sheet 1.
- Stormwater Management Report
- Simple Method Pollutant Removal Calculation Spreadsheet
- Maintenance schedule.

6. Stormwater Controls

a. Stormwater Management Objectives

The concept for stormwater management is to control the increased volume and rate of surface runoff caused by the development of roads and parking areas. The increased volumes and rates will be reduced to existing or pre-development levels by using measures to slow surface runoff from developed areas and increase infiltration.

The proposed stormwater facilities are designed to control a one hundred (100) year event. Water quality treatment, including treatment of the Water Quality Volume (WQV) is attained via micropool extended detention.

The objectives of the stormwater management plan are:

- Prevent increased runoff from developed land to reduce potential flooding and flood damage.
- Minimize the erosion potential from new construction.
- Increase water recharge.
- Enhance the quality of stormwater runoff to prevent water quality degradation in receiving water bodies.

b. Erosion and Sediment Controls – Structural Practices

i. Temporary

Silt fences, a water bar geotextile fabric in "cutoff swale". See attached Sheets 1 and 2, and construction sequencing plan above.

ii. Permanent

Micropool Extended Detention and level spreaders, cutoff swale above parking lot, rip rap culvert outfalls. See attached Sheets 1 and 2 and Stormwater Management Report.

c. Stabilization Practices (including vegetative practices)

i. Temporary

Temporary seeding with annual rye. See construction sequencing description above.

ii. Permanent

Permanent Seeding with Adirondack Mix and surfacing parking lot with gravel. See attached Sheets 1 and 2 and the construction sequencing above.

d. Additional Controls (if necessary)

None proposed in addition to those already described.

e. Supporting Materials – for construction activities meeting conditions A, B, or C in Part III.A.1.b of GP-02-01.
   - Hydrologic/hydraulic analysis for all structural components of the stormwater control system for the applicable design storm(s).
   - Comparison of post-development stormwater runoff conditions with pre-development conditions.
   - Dimensions, material specifications and installation details for each post-construction stormwater control practice.
   - Maintenance schedule to ensure continuous and effective operation of each post-construction stormwater control practice.

See Attached Stormwater Management Report.

7. Comparison of Pre- and Post-Construction Stormwater Runoff

a. Stormwater Quantity

Site Area:	13.125 acres
Total Area of Disturbance:	5.25 acres
Total Acres of New Impervious:	2.44 acres*

*gravel parking lot considered impervious for design purposes

Weighted CN: 76
☒ If HydroCAD, then A.
☐ If Rational, then B.

A.

Design Year Storm	Pre-construction	Post-construction
1. 1-year	1.46 cfs	1.48 cfs
2. 10-year	7.61 cfs	7.50 cfs
3. 100-year	15.38 cfs	15.16 cfs

B.

Design Year Storm	Pre-construction	Post-construction
1.	cfs	cfs
Weighted CN		

b. Stormwater Quality

Water Quality Storage Volume WQ_v = 0.114 acre-feet of storage

Table 1. Pre-development and post-development pollutant loadings.*

	SMP Pollutant Reductions						
	TSS	TP	TN	Cu	Pb	Zn	Bacteria
SMP reduction	80%	50%	35%	60%	60%	60%	70%

*See attached spreadsheet – Stormwater Pollutant Loading – General Simple Method

Spreadsheet For Stormwater Pollutant Loading - General Simple Method

Simple Method Calculations				**Project:**	Whiteface Lot #5			
1. General Loading Formula								
L=0.226*R*C*A								
where L = annual load (lbs), R= annual runoff (inches), C = pollutant concentration (mg/l), A =area (acres)								
Note: C should Use National Median Concentrations (DEC Manual Table A.1)								
Note: A (area) should only be the area where covertype/land use is changed								
2. Calculating R								
R=P(annual rainfall in inches)*Pj (fraction of rainfall producing runoff=0.9)*Rv(runoff coefficient)								
where Rv = 0.05+0.9Ia (impervious fraction)								
P=	44	annual rainfall in inches						
Ia=	19	percent impervious						
R=	679.14							
3. Project Specifics - Loading Calculation Inputs								
R=	679.14	inches						
C=	54.5	mg/l	TSS					
C=	0.26	mg/l	TP					
C=	2	mg/l	TN					
C=	11.1	mg/l	Cu					
C=	50.7	mg/l	Pb					
C=	129	mg/l	Zn					
A=	2.44	acres	(affected area only - not entire site)					
3. Annual Loading for Solids, Nutrients and Metals (Calculated)								
L-TSS=	20410.52	lbs						
L-TP=	97.37129	lbs						
L-TN=	749.00992	lbs						
L-Cu=	4157.0051	lbs						
L-Pb=	18987.402	lbs						
L-Zn=	48311.14	lbs						
4. Annual Loading for Bacteria (Calculated)								
L=103*R*C*A		billion colonies						
L=	256022.2	billion colonies						
5. Pollutant Loading (L) to Different SMPs								
5.a Areas Contributing to Different SMPs								
A=	2.44	total area (acres)						
A1=	2.44	area draining to wet ponds (acres)						
A2=		area draining to stormwater wetlands (ares)						
A3=		area draining to filtering practices (acres)						
A4=		area draining to infiltration practices (acres)						
A5=		area draining to water quality swales (acres)						
A6=	0	area not served by A1 through A5 (acres)				**Explain:**		

Spreadsheet For Stormwater Pollutant Loading - General Simple Method

5.h Zn Loading (LZn) To Different SMPs								
L1Zn=	48311.14	loading treated by wet ponds (lbs)						
L2Zn=	0	loading treated by stormwater wetlands (lbs)						
L3Zn=	0	loading treated by filtering practices (lbs)						
L4Zn=	0	loading treated by infiltration practices (lbs)						
L5Zn=	0	loading treated by water quality swales (lbs)						
L6Zn=	0	loading treated by others (lbs)						
5.i Bacteria Loading (LB) To Different SMPs								
L1B=	256022.2	loading treated by wet ponds (billion colonies)						
L2B=	0	loading treated by stormwater wetlands (billion colonies)						
L3B=	0	loading treated by filtering practices (billion colonies)						
L4B=	0	loading treated by infiltration practices (billion colonies)						
L5B=	0	loading treated by water quality swales (billion colonies)						
L6B=	0	loading treated by others (billion colonies)						
6. Pollutant Removal Efficiencies (from DEC Table A.4)								
	Wet Ponds	Wetlands	Filtering	Infiltration	Swales	Other		
TSS	0.8	0.8	0.85	0.9	0.85			
TP	0.5	0.5	0.6	0.7	0.4			
TN	0.35	0.3	0.4	0.5	0.5			
Pb	0.6	0.4	0.7	0.9	0.7			
Cu	0.6	0.4	0.7	0.9	0.7			
Zn	0.6	0.4	0.7	0.9	0.7			
Bacteria	0.7	0.8	0.35	0.9	0			
7. Pollutant Export (E) Post-Treatment by SMP								
7.a TSS								
E1TSS=	4082.1041	wet ponds						
E2TSS=	0	wetlands						
E3SS=	0	filtering						
E4TSS=	0	infiltration						
E5TSS=	0	swales						
E6TSS=	0	other						
7.b TP								
E1TP=	48.685645	wet ponds						
E2TP=	0	wetlands						
E3TP=	0	filtering						
E4TP=	0	infiltration						
E5TP=	0	swales						
E6TP=	0	other						
7.c TN								
E1TN=	486.85645	wet ponds						
E2TN=	0	wetlands						
E3TN=	0	filtering						
E4TN=	0	infiltration						
E5TN=	0	swales						
E6TN=	0	other						

7.d Cu		
E1Cu=	1662.802	wet ponds
E2Cu=	0	wetlands
E3Cu=	0	filtering
E4Cu=	0	infiltration
E5Cu=	0	swales
E6Cu=	0	other
7.e Pb		
E1Pb=	7594.9606	wet ponds
E2Pb=	0	wetlands
E3Pb=	0	filtering
E4Pb=	0	infiltration
E5Pb=	0	swales
E6Pb=	0	other
7.f Zn		
E1Zn=	19324.456	wet ponds
E2Zn=	0	wetlands
E3Zn=	0	filtering
E4Zn=	0	infiltration
E5Zn=	0	swales
E6Zn=	0	other
7.g Bacteria		
E1B=	76806.659	wet ponds
E2B=	0	wetlands
E3B=	0	filtering
E4B=	0	infiltration
E5B=	0	swales
E6B=	0	other
8. Total Post-Treatment Export		
TSS	4082.1041	lbs
TP	48.685645	lbs
TN	486.85645	lbs
Cu	1662.802	lbs
PB	7594.9606	lbs
Zn	19324.456	lbs
Bacteria	76806.659	billion colonies
9. Overall SMP Treatment Efficiency (Percent Removal)		
TSS	80.00%	
TP	50.00%	
TN	35.00%	
Cu	60.00%	
PB	60.00%	
Zn	60.00%	
Bacteria	70.00%	

Appendix 1
Other Controls

Waste Materials: All waste materials generated during construction will be disposed at a suitable landfill, transfer station or C and D landfill.

Hazardous Waste: The project will not be a generator of hazardous waste and it is not anticipated that any hazardous waste will be generated during construction. If there are any materials generated, a licensed hazardous waste carrier will be contracted to dispose the hazardous material at a suitable disposal site. If hazardous materials are discovered during construction, the work will be stopped until the issue is resolved.

Sanitary Waste: Sanitary facilities will be available to construction personnel at existing Whiteface Mountain facilities.

Offsite Vehicle Tracking: Project construction will be self-contained within Whiteface Mountain. Off site vehicle tracking is not anticipated to occur. If any significant off-site vehicle tracking begins to occur, the contractor will be directed to institute an as-needed street sweeping program in the immediate vicinity of the site.

Timing of Measures/Controls

- Temporary structural erosion controls will be installed prior to earthwork as per the attached plans.

- A qualified professional shall conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP and required by Part III.D of GP-02-01 have been adequately installed to ensure overall preparedness of the site for commencement of construction.

- Structural erosion controls and non-stabilized areas shall be inspected once a week or within 24 hours after a rainfall of 0.5 inches or more. Copies of the Stabilization Inspection Forms and Structural Inspection Forms located at the end of this report shall be completed in full for every inspection performed.

- Areas to be undisturbed for more than 14 days will be temporarily stabilized by seeding.

- Disturbed areas will be reseeded and mulched immediately after final contours are re-established and no more than 14 days after the completion of construction at that site.

- Temporary erosion control devices will not be removed until the area served is stabilized by the growth of vegetation and the area is certified as being stabilized by the inspecting qualified professional.

- Any areas that cannot be seeded to turf by October 1 or earlier will receive a temporary seeding. The temporary seeding will consist of winter rye seeded at the rate of 120 pounds per acre (2.5 pounds per 1,000 square feet).

The operator shall prepare a summary of construction status using the Construction Sequence Form at the end of this document once every month. Significant deviations to the sequence and reasons for those

deviations (i.e. weather, subcontractor availability, etc.), shall be noted by the contractor. The schedule shall be used to record the dates for initiation of construction, implementation of erosion control measures, stabilization, etc. A copy of this table will be maintained at the construction site and be updated in addition to the individual Stabilization Inspection Forms and Structural Inspection Forms completed for each inspection.

Appendix 2
Maintenance/Inspection Procedures

Erosion and Sediment Control Inspection and Maintenance Practices
These are the inspection and maintenance practices that will be used to maintain erosion and sediment controls.

A maintenance inspection report will be made after each inspection. A copy of the report form to be completed by the inspector is attached in Appendix 4. Reports should be compiled and maintained on-site.

- The inspecting qualified professional will supervise erosion control activities on the site. Weekly inspections of erosion control devices will be made, as well as inspections following any storm event of 0.5 inches or greater.

- All measures will be maintained in good working order; if repair is necessary, it will be initiated within 24 hours of report.

- Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.

- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in ground.

- All temporary sediment basins should be inspected for stability and integrity once a week or after a storm event of 0.5 inch or more. Any structural failure in sediment basins or trenches that serve them will be repaired within 24 hours after detection.

- All temporary sediment basins or trenches shall be cleaned out when one foot of sediment or half the design depth of the trap has accumulated. All spoils shall be removed to a stabilized upland area.

- Seeded and planted areas will be inspected for bare spots, washouts, and healthy growth. If necessary, spot reseeding or sodding will be implemented.

Appendix 3
Spill Prevention Practices

Good Housekeeping and Material Management Practices
The following good housekeeping and material management practices will be followed on site during the construction project to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

- Materials will be brought on site in the minimum quantities required.
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposal.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The construction manager or his designee will inspect daily to ensure proper use and disposal of materials on site.
- The contractor shall prohibit washing of tools, equipment, and machinery in or within 100 feet of any watercourse or wetland.
- All above grade storage tanks are to be protected from vehicle damage by temporary barriers.

Inventory for Pollution Prevention Plan
The materials and substances listed below are expected to be on-site during construction.

- Petroleum for fueling vehicles will be stored in above ground storage tanks. Tanks will either be steel with an enclosure capable of holding 110% of the storage tank volume or of a Con-Store, concrete encased type typically employed by NYSDOT. Hydraulic oil and other oils will be stored in their original containers. Concrete and asphalt will be stored in the original delivery trucks.
- Fertilizer may be stored on site in its original container for a short period of time prior to seeding. Original containers will be safely piled on pallets or similar devices to protect from moisture.
- Paints and other similar materials will be stored in their original containers and all empty containers will be disposed of in accordance with label directions.

Hazardous Products
These practices are used to reduce the risks associated with hazardous materials.

- Products will be kept in original containers unless they are not resealeable.
- Original labels and material safety data sheets will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

Spill Prevention – Product Specific Practices
The following product specific practices will be followed on site.

Petroleum Products:

- Construction personnel should be made aware that emergency telephone numbers are located in this SWPPP.
- The contractor shall immediately contact NYSDEC in the event of a spill, and shall take all appropriate steps to contain the spill, including construction of a dike around the spill and placing absorbent material over this spill.
- The contractor shall instruct personnel that spillage of fuels, oils, and similar chemicals must be avoided.
- Fuels, oils, and chemicals will be stored in appropriate and tightly capped containers. Containers shall not be disposed of on the project site.
- Fuels, oils, chemicals, material, equipment, and sanitary facilities will be stored/located away from trees and at least 100 feet from streams, wells, wet areas, and other environmentally sensitive sites.
- Dispose of chemical containers and surplus chemicals off the project site in accordance with label directions.
- Use tight connections and hoses with appropriate nozzles in all operations involving fuels, lubricating materials or chemicals.
- Use funnels when pouring fuels, lubricating materials or chemicals.
- Refueling and cleaning of construction equipment will take place in parking areas to provide rapid response to emergency situations.
- All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Any vehicle leaking fuel or hydraulic fuel will be immediately scheduled for repairs and use will be discontinued until repairs are made.

Fertilizers:

- Fertilizer will be stored in its original containers on pallets with water resistant coverings.
- Proper delivery scheduling will minimize storage time.
- Any damaged containers will be repaired immediately upon discovery and any released fertilizer recovered to the fullest extent practicable.

Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup. The construction manager responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least one other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the onsite construction office or trailer.

- Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. Any spill in excess or suspected to be in excess of two gallons will be reported to the NYSDEC Regional Spill Response Unit. Notification to the NYSDEC (1-800-457-7362) must be completed within two hours of the discovery of the spill.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to absorbent pads, brooms, dust pans, mops, rags, gloves, goggles, activated clay, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with spilled substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size.

SPILL RESPONSE REPORT

Within 1 hour of a spill discovery less than 2 gallons in volume the following must be notified:
Jay Rand, Whiteface 946-4201
Bob Hammond, ORDA 523-1655

Within 1 hour of a spill discovery greater than 2 gallons and the following must be notified:
Jay Rand, Whiteface 946-4201
Bob Hammond, ORDA 523-1655
NYSDEC Spill Response Hotline 1-800-457-7362
Spill Response Contractor

Material Spilled: _____

Approximate Volume: _____

Location: _____

Distance to nearest down gradient drainage: _____

Distance to nearest down gradient open water: _____

Temporary control measures in place: _____

Appendix 4
Forms for the Stormwater Pollution Prevention Plan

Whiteface Mountain Lot #5
SWPP INSPECTION REPORT

_____	_____	_____
Inspector Name	Signature	Date of Inspection

Inspection #_____

YES	NO		
☐	☐	Routine Inspection.	Date of last inspection:_____
☐	☐	Inspection following rain event.	Date/time of storm ending:_____
			Rainfall amount:_____
			Recorded by:_____
☐	☐	Is this a final site inspection?	
☐	☐	Has site undergone final stabilization?	
☐	☐	If so, have all temporary erosion and sediment controls been removed?	

REPORT CHECKLIST

Complete the following report checklist and key issue items to attached site plan.

1. Site Disturbance (Indicate Locations on Plan)

YES	NO		
☐	☐	1.1	Areas previously disturbed, but have not undergone active site work in the last 14 days?
☐	☐	1.2	Areas disturbed within last 14 days?
☐	☐	1.3	Areas expected to be disturbed in next 14 days?
☐	☐	1.4	Do areas of steep slopes or complex stabilization issues exist? If "YES" explain_____

Additional Comments: _____

2. Inspection of Control Devices

YES	NO		
☐	☐	2.1	Perimeter controls (silt fences) installed? Type_____
☐	☐	2.2	Silt accumulation? Amount (%)_____
☐	☐	2.3	Inlet protection? Type_____
☐	☐	2.4	Silt accumulation? Amount (%)_____

Additional Comments: _____

_____

_____

3. Stabilization

YES	NO		
☐	☐	3.1	Are all existing disturbed areas contained by control devices? Type of devices_____
☐	☐	3.2	Are there areas that require stabilization within the next 14 days? Specify Area_____
☐	☐	3.3	In recently or previously stabilized areas, is there evidence of permanent or temporary stabilization measures that have been implemented where work has ceased for 14-21 days?
☐	☐	3.4	Is there current snow cover or frozen ground conditions?
☐	☐	3.5	Rills or gullies?
☐	☐	3.6	Slumping/deposition?
☐	☐	3.7	Loss of vegetation?
☐	☐	3.8	Lack of germination?
☐	☐	3.9	Loss of mulching?

☐ ☐ Action Items: _____

_____

_____

4. Receiving Structures/Water Bodies

Indicate locations where runoff leaves the project site on the site plan.

_____

YES	NO		
☐	☐	4.2	Surface water swale or stream?
☐	☐	4.3	Municipal or community system?
		4.4	Indicate drainage pathways.

_____

Inspect locations where runoff from project site enters the receiving waters and indicate if there is evidence of:

☐	☐	4.5	Rills or gullies?
☐	☐	4.6	Slumping/deposition?
☐	☐	4.7	Loss of vegetation?
☐	☐	4.8	Undermining of structures?

☐ ☐ Action Items: _____

_____

_____

5. General Site Condition

YES	NO		
☐	☐	5.1	Have action items from previous reports been addressed?
		5.2	Contractors summary on pertinent progress last 7 days.
			_____
			_____
		5.3	Anticipated work to be begun in the next 7 days.
			_____
			_____
☐	☐	5.4	Does routine maintenance of protection components occur on a regular basis?
☐	☐	5.5	Does cleaning and/or sweeping affected roadways occur, at minimum, daily?
☐	☐	5.6	Is debris and litter removed on a monthly basis, or as necessary?
☐	☐	5.7	Is the site maintained in an orderly manner?

Additional Comments: _____

_____

_____

SUMMARY OF ACTION ITEMS

_____

_____

_____

_____

_____

Construction Sequence Form

Construction Activities (Identify name of planned practices)	Date Complete
1.	
2.	
3.	
4.	

STORM WATER POLLUTION PREVENTION PLAN
PLAN CHANGES, AUTHORIZATION, AND CHANGE CERTIFICATION

CHANGES REQUIRED TO THE POLLUTION PREVENTION PLAN:

_____

_____

_____

_____

REASONS FOR CHANGES:

_____

_____

_____

_____

REQUESTED BY: _____

DATE: _____

AUTHORIZED BY: _____

DATE: _____

CERTIFICATION OF CHANGES:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the penal code.

SIGNATURE: _____

DATE: _____

Whiteface Mountain Parking Lot #5 Construction Sequencing and Erosion Control

1. Install Downhill Work Limit Erosion Control

Beginning at the existing bike path install silt fencing at the lower limit of construction disturbance. Clear a "work road" approximately 10 feet wide along the downhill disturbance limit. Install sections of silt fence at the downhill edge of disturbance and on the contours so that silt fence sections are not running uphill or downhill (installation detail attached).

Because the downhill edge of disturbance is not on the same contour, in some instances silt fence will not be continuous but will need to be staggered. When viewed from uphill there shall be overlap and no gaps between the sections of staggered silt fence (see schematic below).

```
                    SLOPE
                      ⇓
.
uu-----------S----------
uuuuuuuuuuuuuu-----------S-----------
                uuuuuuuuuuuuuuuuuuuu -----------S----------uuuuuuuuuuuu
                                   uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
```

uuu = clearing/disturbance limit
-----S---- = silt fence

The northern 2/3 can be one continuous run of silt fence along the 1300 foot contour with ends of adjoining silt fence sections properly secured to the same post.

If possible, the area of silt fence installation should include the existing bike path. However, if it is necessary to keep the existing bike path passable during construction, install a water bar across the bike trail just downhill of the work limit. The gap in the silt fence for the bike trail shall be as narrow as practical. At the end of each work day a row of hay bales shall be installed across the bike trail to span the gap in the silt fence.

Temporarily stabilize the disturbed "work road" by seeding with ryegrass (annual rye is acceptable) at a rate of 4 pounds per 1,000 square feet.

2. Improve/Construct Upper Driveway/Construction Access Road

Cut and grub the areas that need to be cleared for upper driveway from Lot 4. Install silt fences along downhill edge. Grade driveway, including installation of 24 feet of 12" HPDE culvert. Install flared end section and rip rap outfall at culvert (see detail). Surface driveway with six inches of bank run gravel or other appropriate crushed stone surface on top of geotextile fabric. Stabilize disturbed areas outside the limits of the driveway by seeding with the Adirondack Seed Mix at a rate of 5 pounds per 1,000 square feet. Mulch seeded areas with straw at a rate of 3 bales per thousand square feet. Anchor mulch in place by crimping with tracked vehicle driven up and down the mulched area slope or other suitable physical means, or secure with non-asphaltic tackifier.

3. Install Culvert Under Bike Path

Install 16 foot 12" HPDE culvert under bike path as shown, including flared end section and rip rap outfall. Backfill culvert with excavated materials. Remove any excess backfill material to an area already protected by silt fence. Stabilize disturbed areas outside the limits of the bike path by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet. Mulch seeded areas with straw at a rate of 3 bales per thousand square feet. Anchor mulch in place by crimping with tracked vehicle driven up and down the mulched area slope or other suitable physical means, or secure with non-asphaltic tackifier.

4. Install Diversion Swale Uphill Side of Parking Lot

Construct the drainage swale that will divert runoff from uphill around the parking lot. Clear and grub the area to be disturbed uphill of the parking lot. Grade the area uphill of the parking lot to final grades. (Fine grading of the diversion swale itself should be done after the uphill area is graded and stabilized.) Immediately after grading this area stabilize by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet. Mulch seeded areas with straw at a rate of 3 bales per thousand square feet. Anchor mulch in place by crimping with tracked vehicle driven up and down the mulched area slope or other suitable physical means, or secure with non-asphaltic tackifier.

Fine grade diversion swale making sure to create positive grades from the high point. Seed the diversion swale with the Adirondack Seed Mix at a rate of 5 pounds per acre. Line bottom of diversion swale with suitable erosion control blanket such as North American Green S75®, American Excelsior Curlex I® or suitable equivalent. Install riprap level spreader on north side of parking lot.

In order to grade in the swale it may be necessary to clear and grub the upper portion of the parking lot. Care should be taken to clear and grub only that portion of the parking lot absolutely necessary to grade the diversion swale. Any area of the parking lot that is cleared and grubbed for swale construction, but will remain undisturbed for a period of more than seven days, shall be temporarily stabilized by seeding with ryegrass at a rate of 4 pounds per 1,000 square feet (annual ryegrass is acceptable).

5. Grade Detention Basin and Area Downhill

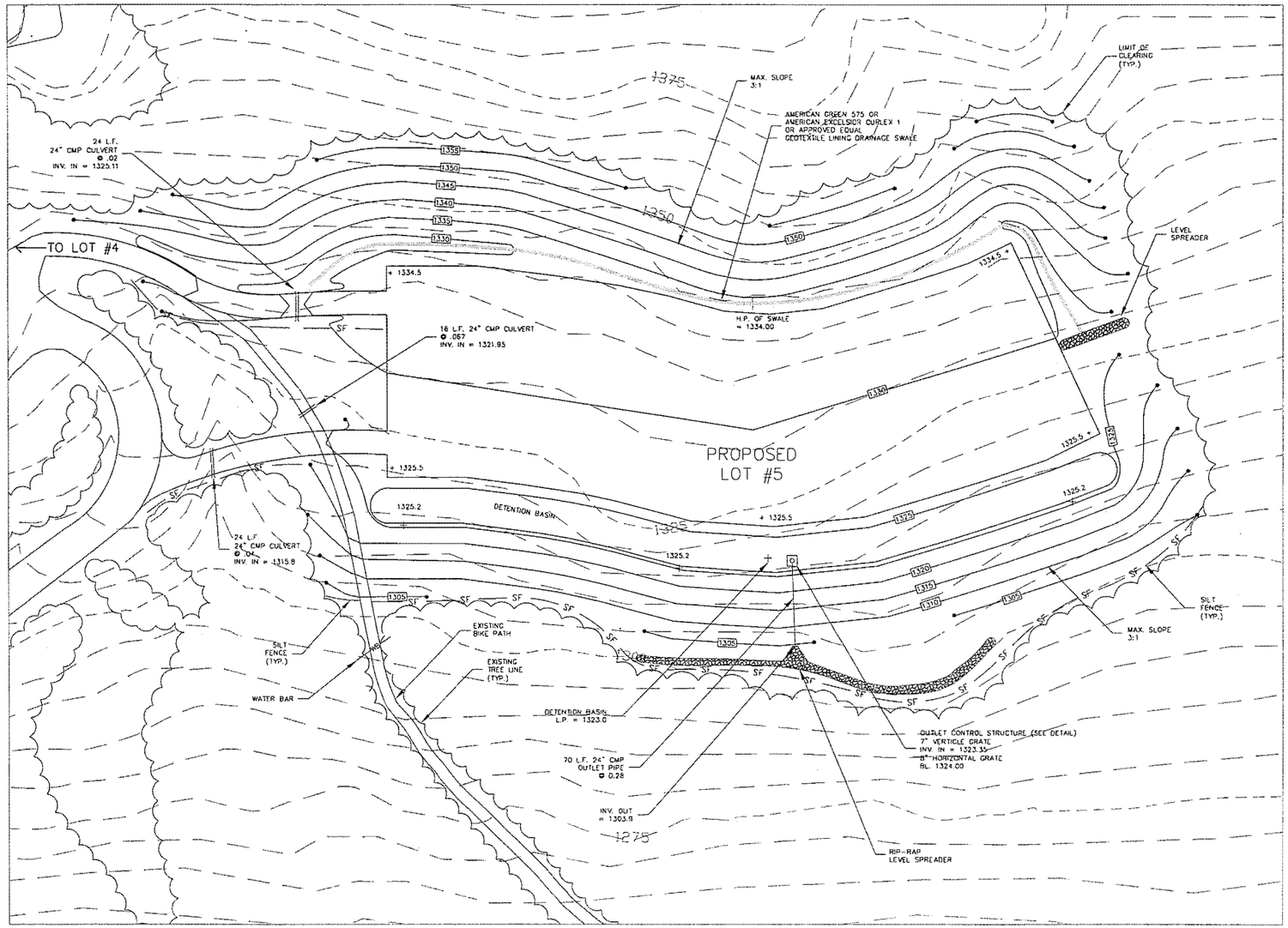
Excavate detention basin and grade slopes downhill to the previously installed silt fence. Stabilize all disturbed areas by seeding with Adirondack Mix at a rate of 5 pounds per 1,000 square feet and mulch with straw at a rate of 3 bales per thousand square feet. Install detention basin outlet structure (see attached detail). Temporarily block off the outlet structure holes so that detention basin will collect and hold any runoff. Install detention basin outlet pipe and level spreader. Repair any previously stabilized areas that were disturbed by reseeding and mulching at the same rates given above. Keep outlet structure holes blocked until parking lot construction is complete and surface is stabilized.

6. Construct Remainder of Parking Lot

Clear and grub remaining area of parking lot. Final grade parking lot including surfacing with bank run gravel or appropriate crushed stone on top of geotextile fabric. Stabilize all disturbed areas outside the limits of the parking lot by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet. Mulch all seeded areas with straw at a rate of 3 bales per thousand square feet. After stabilization of the parking lot area is complete open detention basin outlet structure holes.

7. Construct Lower Driveway

Clear and grub lower driveway installing silt fence at downhill side as shown. Install 12" 24 foot HPDE culvert with flared end section and riprap outfall. NOTE: This culvert shall be installed only when there is no flow in the drainage in which it is placed ("in the dry"). Backfill culvert, install geotextile and surface driveway with bank run gravel or suitable crushed stone. Permanently stabilize all other disturbed areas along the driveway by seeding with the Adirondack Mix at a rate of 5 pounds per 1,000 square feet and mulching with straw at the rate of 3 bales per thousand square feet.



THIS PLAN IS BASED UPON AERIAL PHOTOGRAPHY (DATE UNKNOWN) PROVIDED BY OLYMPIC REGIONAL DEVELOPMENT AUTHORITY. THE LA GROUP ASSUMES NO RESPONSIBILITY FOR HORIZONTAL OR VERTICAL INACCURACIES IN FIELD CONDITIONS ENCOUNTERED DURING CONSTRUCTION, OR ADDITIONAL COSTS INCURRED AS A RESULT OF UTILIZING THIS INFORMATION.

WHITEFACE

Prepared For:
OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
LAKE PLACID, NEW YORK

Prepared By:

SE GROUP | the LA group landscape architecture engineering inc. | IZA Engineering & Planning

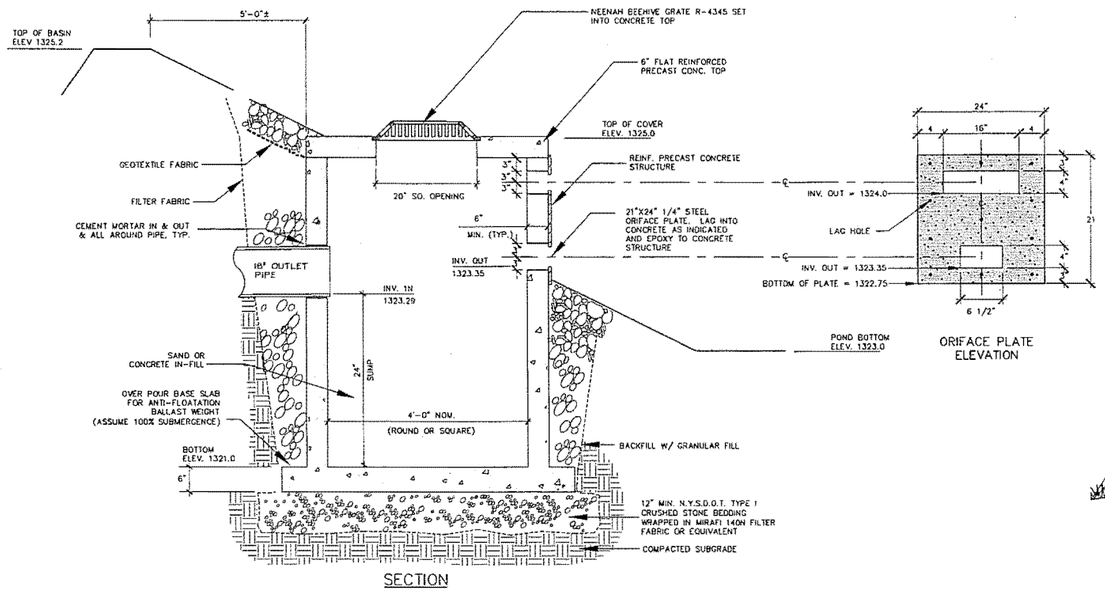
COMPREHENSIVE MANAGEMENT AND PLANNING REVIEW AND UNIT MANAGEMENT PLAN

25 0 25 50 100
Scale: 1" = 50' Contour Interval = 5 Feet
NORTH

TITLE: PROPOSED LOT #5 PHASING AND SEDIMENT & EROSION PLAN

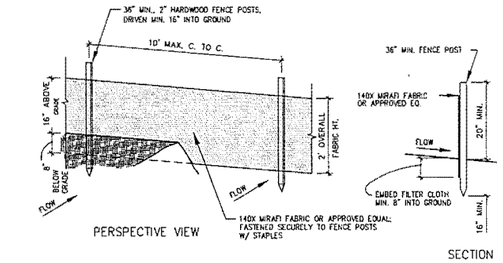
DATE: JUNE 2003
FIGURE #: 1

PROJECT NUMBER: 01043 | FILE: 01043BASE



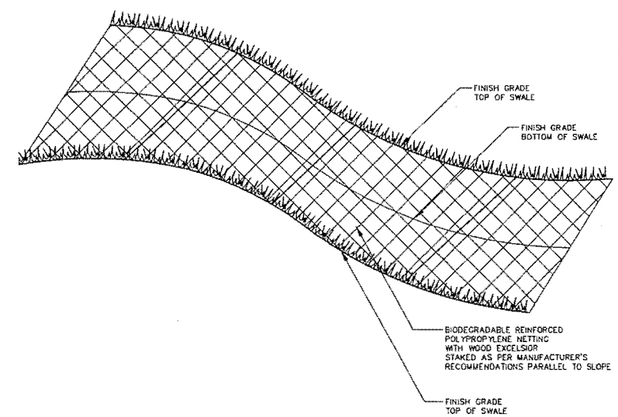
1 CONTROLLED RELEASE STRUCTURE

N.T.S.



3 SILT FENCE DETAIL

N.T.S.



4 EXCELSIOR EROSION CONTROL BLANKET

N.T.S.

STANDARD AND SPECIFICATIONS FOR WATER BAR

Definition

A ridge or ridge and channel constructed diagonally across a sloping road or utility right-of-way that is subject to erosion.

Purpose

To limit the accumulation of erosive volumes of water by diverting surface runoff at predesigned intervals.

Conditions Where Practice Applies

Where runoff protection is needed to prevent erosion on sloping access right-of-ways or either long, narrow sloping areas generally less than 100 feet in width.

Design Criteria

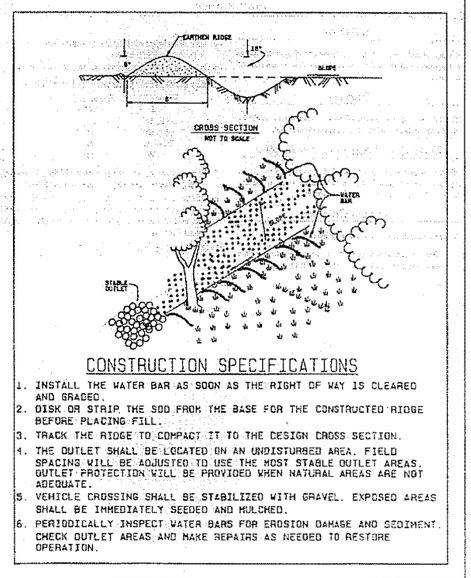
Design computations are not required.

1. The design height shall be a minimum of 18 inches measured from channel bottom to ridge top.
2. The side slopes shall be 2:1 or flatter; a minimum of 4:1 where vehicles cross.
3. The base width of the ridge shall be six feet minimum.
4. The spacing of the water bars shall be as follows:

Slope (%)	Spacing (ft)
< 5	125
5 to 10	100
10 to 20	75
20 to 35	50
> 35	25

5. The positive grade shall not exceed 2%. A crossing angle of approximately 60 degrees is preferred.
6. Water bars should have stable outlets, either natural or constructed. Site spacing may need to be adjusted for field conditions to use the most suitable areas for water disposal.

Water Bar Details

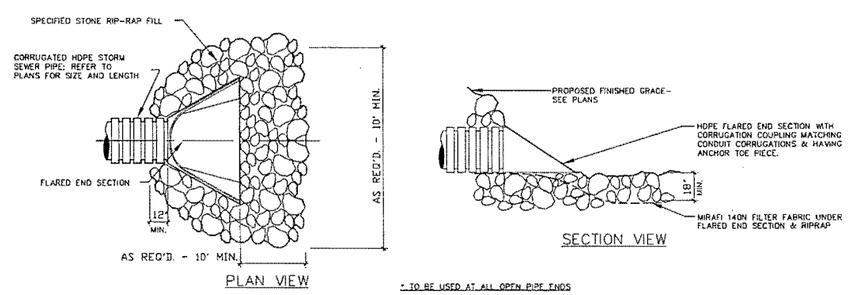


CONSTRUCTION SPECIFICATIONS

1. INSTALL THE WATER BAR AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
2. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
3. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
4. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.
5. VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE IMMEDIATELY SEEDED AND MULCHED.
6. PERIODICALLY INSPECT WATER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.

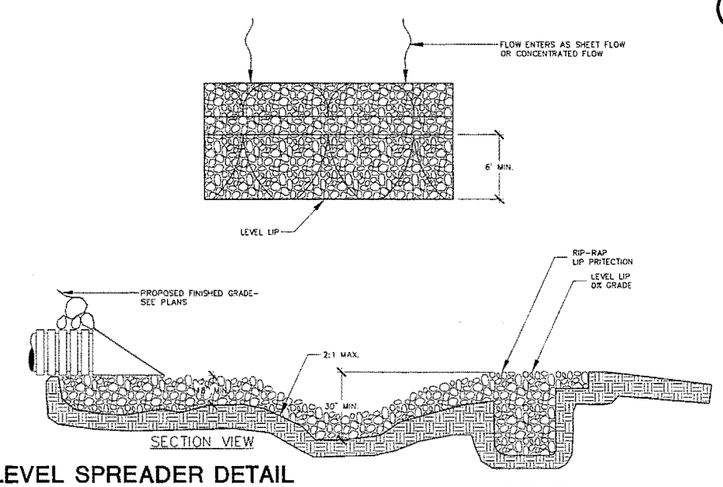
6 WATER BAR DETAIL

N.T.S.



2 FLARED-END SECTION DETAIL

N.T.S.



5 RIP-RAP LEVEL SPREADER DETAIL

*VARIATION ON NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL

N.T.S.

WHITEFACE

Prepared For:
OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
LAKE PLACID, NEW YORK

Prepared By:

SE GROUP

COMPREHENSIVE MANAGEMENT AND PLANNING REVIEW AND UNIT MANAGEMENT PLAN

25 0 25 50 100

Scale: 1" = 60' Contour Interval = 5 Feet

NORTH

TITLE: PROPOSED LOT #5 DETAIL SHEET

DATE: JUNE 2003

FIGURE #: 2

PROJECT NUMBER: 01043 | FILE: 01043BASE

STORMWATER MANAGEMENT REPORT
For
WHITEFACE MOUNTAIN
PARKING LOT #5

Prepared by:

The LA Group, P.C.
40 Long Alley
Saratoga Springs, NY 12866

June 2003

STORMWATER MANAGEMENT REPORT

WHITEFACE MOUNTAIN
PARKING LOT #5
WILMINGTON, NEW YORK

Introduction:

Stormwater computations for a proposed parking lot (Parking Lot #5) at Whiteface Mountain were conducted using the USDA Soil Conservation Service Technical Release No. 20. The program used was the HydroCAD Stormwater Modeling System produced by Applied Microcomputer Systems of Chocurua, New Hampshire. The design storms studied were the one (1) year event (Channel Protection, CP_v), ten (10) year event (Overbank Flood Control, QP), and one hundred (100) year event (Extreme Flood Control, QF). The 24 hour Type II storms produce a total rainfall of 2.1, 3.5 and 4.8 inches respectively. Calculations were also completed for the treatment of the required Water Quality Volume (90% rainfall event, WQ_v) measuring 0.8 inches in northern Essex County.

Design Concept:

The concept for stormwater management is to control the increased volume and rate of surface runoff caused by the development of buildings, roads and parking areas. The increased volumes and rates will be reduced to existing or pre-development levels by using measures to slow surface runoff from developed areas and increase infiltration.

The proposed stormwater facilities are designed to control a one hundred (100) year event. Water quality treatment is attained via extended detention.

The objectives of the stormwater management plan are:

- Prevent increased runoff from developed land to reduce potential flooding and flood damage.
- Minimize the erosion potential from new construction.
- Increase water recharge.
- Enhance the quality of stormwater runoff to prevent water quality degradation in receiving water bodies.

Existing Conditions:

The project site is made up of approximately 13.125 acres of land located within Whiteface Mountain Ski Center, 2.44 acres of which will be developed as a gravel surface overflow parking area. Currently the land is primarily wooded. The soils are a mix of Becket Bouldery Fine Silt Loam and Skerry Bouldery Silt Loam. The Soil Conservation Service classifies the soils on site as Hydrologic Group C.

Under existing conditions the site is within a single 13 acre watershed (Subcatchment 1), which begins at a high point approximately 1000 ft. upgradient of the parking area site. The run-off consists of sheet flow through a wooded area with light underbrush and shallow concentrated flow thru woods with heavy litter. It eventually drains into the west branch of the Ausable River. Table 1 summarizes the pre-development runoff volumes and rates. See figure A, "Existing Drainage Plan."

Table 1
Pre-development Runoff

Design Storm	Subcatchment 1	
	Volume	*Rate*
1-Year	.255 af	1.46 cfs
10-Year	.969 af	7.61 cfs
100-Year	1.849 af	15.38 cfs

Proposed Conditions:

Proposed conditions include a 2.4 acre gravel parking lot. Run-off from the undeveloped portion of the existing watershed (Subcatchments 1 & 2) have been diverted via grass swales (Reach 1 & 2) and culverts around the proposed parking lot. Run-off from the proposed parking lot (Subcatchment 3) drains into a detention basin (Pond 1), which overflows into an outlet control structure through a culvert into a rip-rap level spreader, where overflow is dispersed and allowed to sheet flow downgradient. Pond 2 has been used to sum the flows of reaches 1 and 2. See figure B, "Proposed Drainage Plan."

The proposal for management of stormwater is to collect, detain and treat the water quality volume (WQ_v) of all runoff attributed to the proposed parking lot (Subcatchment 3). This runoff will be collected and treated by extended detention within the proposed basin. Modeling of the 90% WQ_v event, with no release from Pond 1, causes the WQ volume to rise to elevation 1323.32. The 7 inch vertical orifice that will moderate the 1 year (CP_v) and 10 year (QP_v) will be set at elevation 1323.35, above the WQ_v elevation. The following table summarizes the WQ_v event in Pond 1.

Table 2
Summary of 90% WQ_v Event from Subcatchment 3

Area	Flow	Volume	Peak Storage	Peak Elevation
2.435 AC	2.65 cfs	0.144 af	4963 cf	1323.32'

As stated previously, Pond 2 has been created to sum reaches 1 and 2, subtracting this summed rate from the pre-development rate provides the release rate for Pond 1, the parking area detention facility. The table below summarizes the release rates for Pond 1.

Table 3
Pond 1 Release Rate

Design Storm	Pre-development Rate	-	Sum of Reach 1 and 2	=	Pond 1 Release Rate
1	1.46 cfs	-	1.11 cfs	=	.35 cfs
10	7.61 cfs	-	6.31 cfs	=	1.30 cfs
100	15.38 cfs	-	12.98 cfs	=	2.40 cfs

In addition to the 7 inch vertical orifice, which will moderate the 1 and 10 year events, an 8 inch horizontal grate has been set at elevation 1324.0 to assist in matching the release rates up to the 100 year (Q_F) event storm.

Conclusion:

The design intent of limiting the proposed runoff rate to a level less than existing has been met by directing stormwater into a detention basin and controlling the rate of release. The quality of the runoff is improved by allowing sediments to settle out in the stormwater management area before releasing it. The following table includes a comparison of the total runoff for each storm event in the pre-development and post-development condition.

Total pre-development flows for the project site have been summed in Pond 3 in order to place all flows in the same timeline.

Table 4
Pre-Development/Post-Development

	Pre-development		Post-development	
	Runoff	*Runoff R1+R2 (P2)*	*Runoff Pond 1*	*Total Pond 3*
1-Year	1.46 cfs	1.11 cfs	.39 cfs	1.48 cfs
10-Year	7.61 cfs	6.31 cfs	1.24 cfs	7.50 cfs
100-Year	15.38 cfs	12.98 cfs	2.27 cfs	15.16 cfs

Computer generated calculations of the drainage analysis follow in this report.
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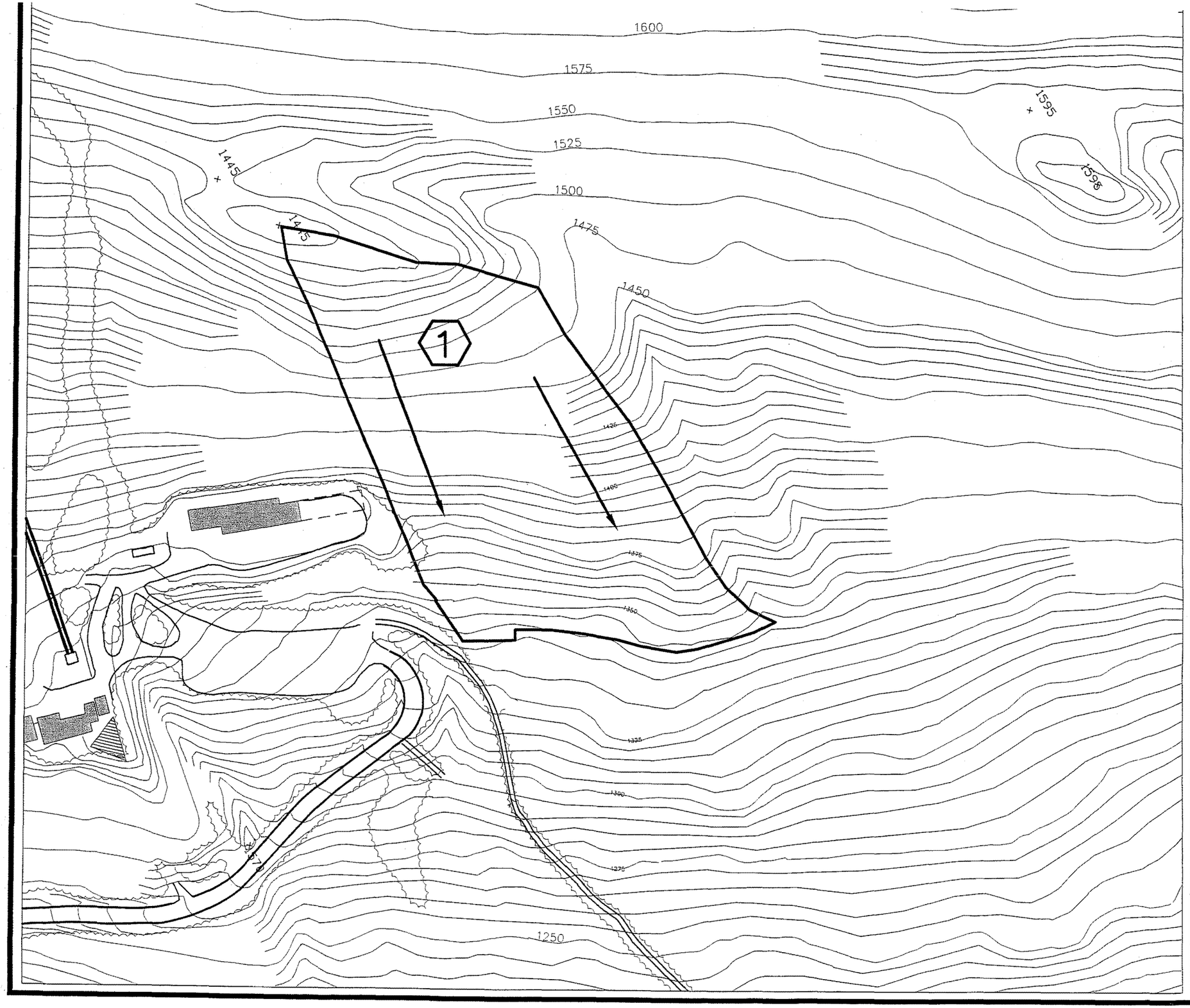


WHITEFACE

Prepared For:

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
LAKE PLACID, NEW YORK

Prepared By:

SE GROUP — USA: BELLEVUE, WA; BURLINGTON, VT; FRISCO, CO; GREENWICH, CT; HANOVER, NH; PARK CITY, UT; JAPAN: TOKYO

the LA group — Landscape Architecture and Engineering, P.C.

Engineering & Planning — Ivan Zdralui Associates, PLLC

COMPREHENSIVE MANAGEMENT AND PLANNING REVIEW AND UNIT MANAGEMENT PLAN

100 0 50 100 200 400

Scale: 1" = 200'

Contour Interval = 5 Feet

NORTH

TITLE:

EXISITNG DRAINAGE PLAN

DATE: FEBRUARY 2003

FIGURE #: A

PROJECT NUMBER: 01102

FILE: [whiteface]

Pre-Development Calculations

Subcatchment 1S: S #1

Runoff = 1.46 cfs @ 12.57 hrs, Volume= 0.255 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=2.10"

Area (ac)	CN	Description
13.125	70	Woods, Good, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	300	0.1333	0.2		**Sheet Flow, Sheet Flow thru woods** Woods: Light underbrush n= 0.400 P2= 2.30"
17.4	1,100	0.1772	1.1		**Shallow Concentrated Flow, thru woods** Forest w/Heavy Litter Kv= 2.5 fps
46.0	1,400	Total			

Subcatchment 1S: S #1

Runoff = 7.61 cfs @ 12.49 hrs, Volume= 0.969 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=3.50"

Area (ac)	CN	Description
13.125	70	Woods, Good, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	300	0.1333	0.2		**Sheet Flow, Sheet Flow thru woods** Woods: Light underbrush n= 0.400 P2= 2.30"
17.4	1,100	0.1772	1.1		**Shallow Concentrated Flow, thru woods** Forest w/Heavy Litter Kv= 2.5 fps
46.0	1,400	Total			

Subcatchment 1S: S #1

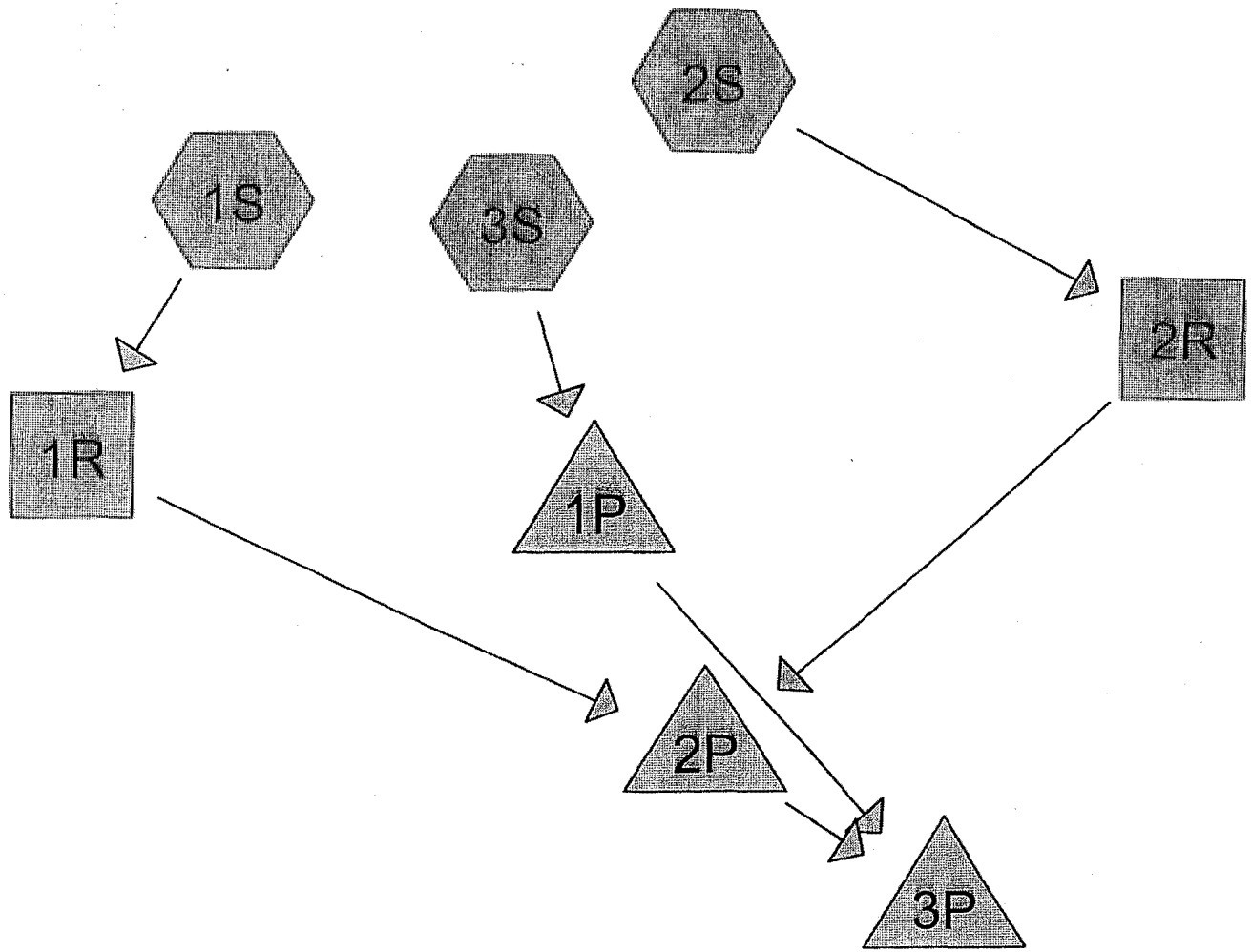
Runoff = 15.38 cfs @ 12.47 hrs, Volume= 1.849 af, Depth= 1.69"

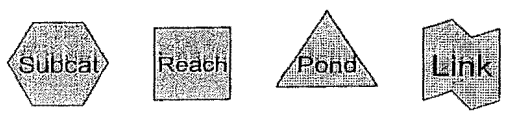
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=4.80"

Area (ac)	CN	Description
13.125	70	Woods, Good, HSG C

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	300	0.1333	0.2		**Sheet Flow, Sheet Flow thru woods** Woods: Light underbrush n= 0.400 P2= 2.30"
17.4	1,100	0.1772	1.1		**Shallow Concentrated Flow, thru woods** Forest w/Heavy Litter Kv= 2.5 fps
46.0	1,400	Total			

Post Development Calculations





Drainage Diagram for Proposed 90% storm
Prepared by the LA group, p.c. 3/7/2003
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Time span=1.00-20.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=0.80"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC #1 Runoff Area=5.693 ac Runoff Depth=0.00"
Length=1,120' Tc=45.5 min CN=70 Runoff= 0.00 cfs 0.000 af

Subcatchment 2S: SC #2 Runoff Area=4.997 ac Runoff Depth=0.00"
Length=950' Tc=33.9 min CN=71 Runoff= 0.00 cfs 0.000 af

Subcatchment 3S: SC #3 Runoff Area=2.435 ac Runoff Depth=0.56"
Length=180' Tc=1.6 min CN=98 Runoff= 2.65 cfs 0.114 af

Reach 1R: R #1 Peak Depth= 0.00' Max Vel= 0.0 fps Inflow= 0.00 cfs 0.000 af
n=0.130 L=407.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 0.00 cfs 0.000 af

Reach 2R: R #2 Peak Depth= 0.00' Max Vel= 0.0 fps Inflow= 0.00 cfs 0.000 af
n=0.130 L=233.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 0.00 cfs 0.000 af

Pond 1P: Pond 1 Peak Storage= 4,963 cf @ 1,323.32' Inflow= 2.65 cfs 0.114 af
Primary= 0.00 cfs 0.000 af Outflow= 0.00 cfs 0.000 af

Pond 2P: Sum R1 + R2 Inflow= 0.00 cfs 0.000 af
Primary= 0.00 cfs 0.000 af

Pond 3P: Total Post Devel. Runoff Inflow= 0.00 cfs 0.000 af
Primary= 0.00 cfs 0.000 af

Total Runoff Area = 13.125 ac Runoff Volume = 0.114 af Average Runoff Depth = 0.10"

Pond 1P: Pond 1

Inflow Area =	2.435 ac,	Inflow Depth =	0.56"		
Inflow =	2.65 cfs @	11.91 hrs,	Volume=	0.114 af	
Outflow =	0.00 cfs @	1.00 hrs,	Volume=	0.000 af,	Atten= 100%, Lag= 0.0 min
Primary =	0.00 cfs @	1.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 1,323.32' Storage= 4,963 cf
Plug-Flow detention time= (not calculated)

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,323.00	0	0
1,324.00	15,363	15,363
1,325.00	19,370	34,733

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=1,323.00' (Free Discharge)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

#	Routing	Invert	Outlet Devices
1	Primary	1,323.35'	**7.0" Vert. Orifice/Grate** C= 0.600
2	Primary	1,324.00'	**8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Pond 2P: Sum R1 + R2

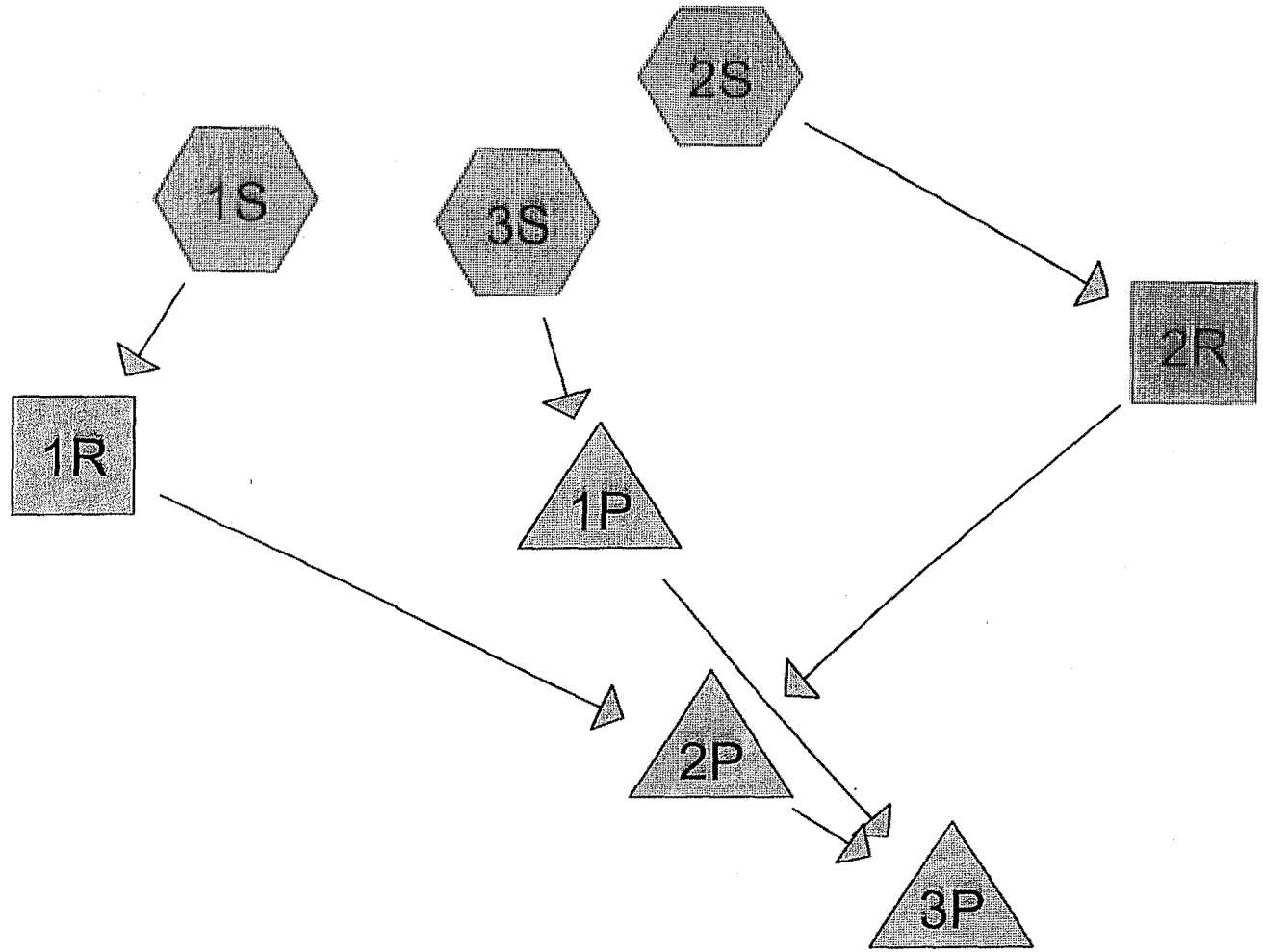
Inflow Area =	10.690 ac,	Inflow Depth =	0.00"		
Inflow =	0.00 cfs @	1.00 hrs,	Volume=	0.000 af	
Primary =	0.00 cfs @	1.00 hrs,	Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min

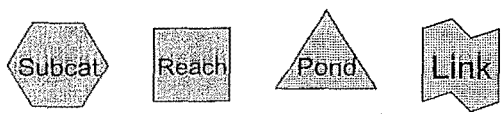
Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Pond 3P: Total Post Devel. Runoff

Inflow Area =	13.125 ac,	Inflow Depth =	0.00"		
Inflow =	0.00 cfs @	1.00 hrs,	Volume=	0.000 af	
Primary =	0.00 cfs @	1.00 hrs,	Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs





Drainage Diagram for Proposed 1-year storm
Prepared by the LA group, p.c. 3/7/2003
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Time span=1.00-20.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=2.10"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC #1 Runoff Area=5.693 ac Runoff Depth=0.23"
Length=1,120' Tc=45.5 min CN=70 Runoff= 0.64 cfs 0.110 af

Subcatchment 2S: SC #2 Runoff Area=4.997 ac Runoff Depth=0.26"
Length=950' Tc=33.9 min CN=71 Runoff= 0.80 cfs 0.108 af

Subcatchment 3S: SC #3 Runoff Area=2.435 ac Runoff Depth=1.77"
Length=180' Tc=1.6 min CN=98 Runoff= 7.69 cfs 0.360 af

Reach 1R: R #1 Peak Depth= 0.21' Max Vel= 0.5 fps Inflow= 0.64 cfs 0.110 af
n=0.130 L=407.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 0.58 cfs 0.107 af

Reach 2R: R #2 Peak Depth= 0.25' Max Vel= 0.6 fps Inflow= 0.80 cfs 0.108 af
n=0.130 L=233.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 0.76 cfs 0.106 af

Pond 1P: Pond 1 Peak Storage= 11,030 cf @ 1,323.72' Inflow= 7.69 cfs 0.360 af
Primary= 0.37 cfs 0.164 af Outflow= 0.37 cfs 0.164 af

Pond 2P: Sum R1 + R2 Inflow= 1.11 cfs 0.213 af
Primary= 1.11 cfs 0.213 af

Pond 3P: Total Post Devel. Runoff Inflow= 1.48 cfs 0.377 af
Primary= 1.48 cfs 0.377 af

Total Runoff Area = 13.125 ac Runoff Volume = 0.578 af Average Runoff Depth = 0.53"

Pond 1P: Pond 1

Inflow Area =	2.435 ac,	Inflow Depth =	1.77"	
Inflow =	7.69 cfs @	11.91 hrs, Volume=	0.360 af	
Outflow =	0.37 cfs @	12.81 hrs, Volume=	0.164 af,	Atten= 95%, Lag= 54.4 min
Primary =	0.37 cfs @	12.81 hrs, Volume=	0.164 af	

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 1,323.72' Storage= 11,030 cf
Plug-Flow detention time= 287.4 min calculated for 0.163 af (45% of inflow)

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,323.00	0	0
1,324.00	15,363	15,363
1,325.00	19,370	34,733

Primary OutFlow Max=0.37 cfs @ 12.81 hrs HW=1,323.72' (Free Discharge)
└─**1=Orifice/Grate** (Controls 0.37 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

#	Routing	Invert	Outlet Devices
1	Primary	1,323.35'	**7.0" Vert. Orifice/Grate** C= 0.600
2	Primary	1,324.00'	**8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Pond 2P: Sum R1 + R2

Inflow Area =	10.690 ac,	Inflow Depth =	0.24"	
Inflow =	1.11 cfs @	12.78 hrs, Volume=	0.213 af	
Primary =	1.11 cfs @	12.78 hrs, Volume=	0.213 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Pond 3P: Total Post Devel. Runoff

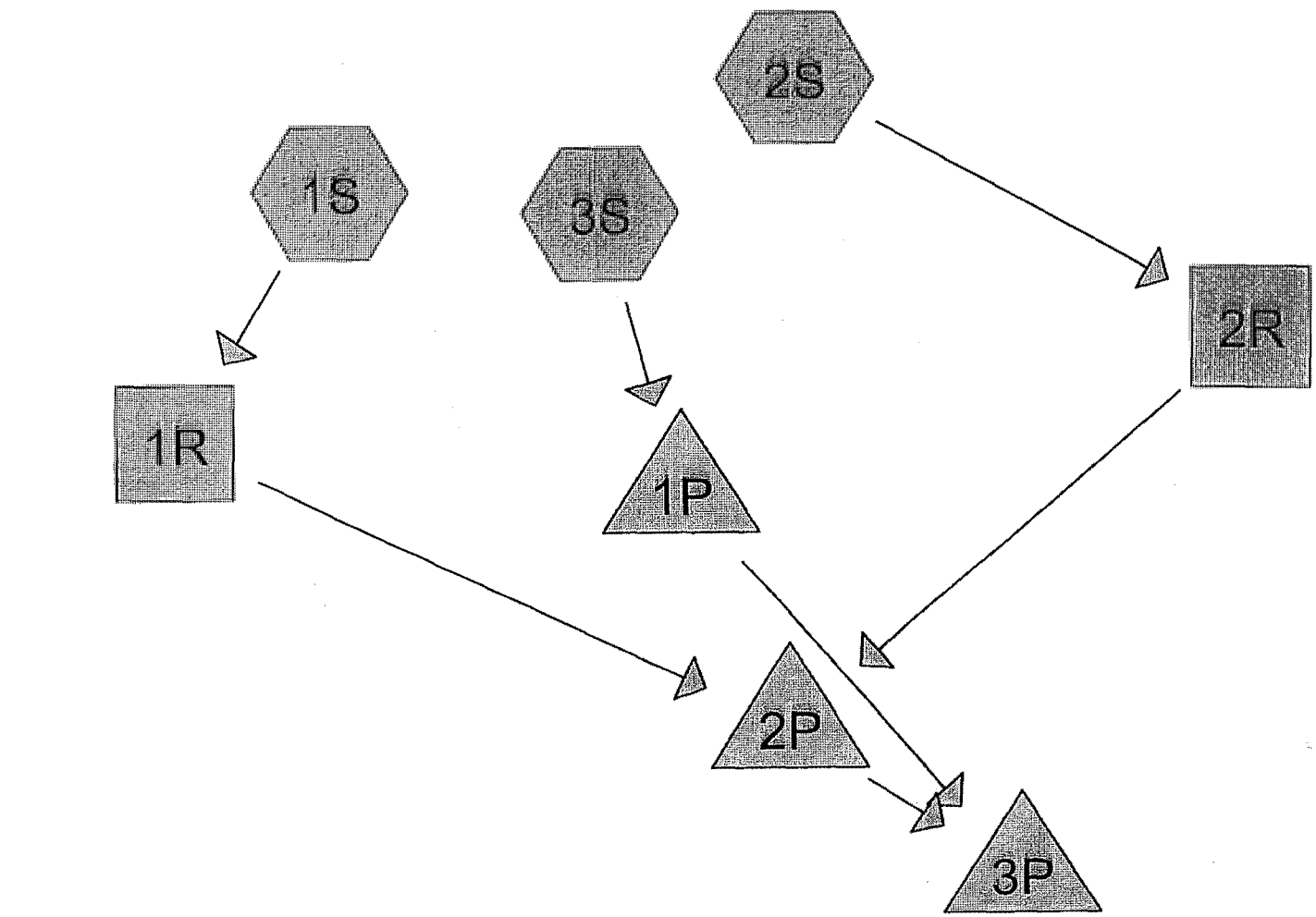
Inflow Area =	13.125 ac,	Inflow Depth =	0.34"	
Inflow =	1.48 cfs @	12.78 hrs, Volume=	0.377 af	
Primary =	1.48 cfs @	12.78 hrs, Volume=	0.377 af,	Atten= 0%, Lag= 0.0 min

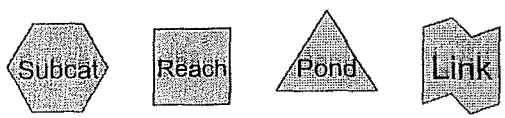
Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Time span=1.00-20.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=2.10"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 2P: Sum R1 + R2

Inflow= 1.11 cfs 0.213 af
Primary= 1.11 cfs 0.213 af





Drainage Diagram for Proposed 10-year storm
Prepared by the LA group, p.c. 3/7/2003
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Time span=1.00-20.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=3.50"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC #1 Runoff Area=5.693 ac Runoff Depth=0.89"
Length=1,120' Tc=45.5 min CN=70 Runoff= 3.33 cfs 0.420 af

Subcatchment 2S: SC #2 Runoff Area=4.997 ac Runoff Depth=0.94"
Length=950' Tc=33.9 min CN=71 Runoff= 3.87 cfs 0.393 af

Subcatchment 3S: SC #3 Runoff Area=2.435 ac Runoff Depth=3.10"
Length=180' Tc=1.6 min CN=98 Runoff= 13.01 cfs 0.629 af

Reach 1R: R #1 Peak Depth= 0.61' Max Vel= 1.0 fps Inflow= 3.33 cfs 0.420 af
n=0.130 L=407.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 3.22 cfs 0.414 af

Reach 2R: R #2 Peak Depth= 0.68' Max Vel= 1.1 fps Inflow= 3.87 cfs 0.393 af
n=0.130 L=233.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 3.80 cfs 0.390 af

Pond 1P: Pond 1 Peak Storage= 17,979 cf @ 1,324.14' Inflow= 13.01 cfs 0.629 af
Primary= 1.24 cfs 0.407 af Outflow= 1.24 cfs 0.407 af

Pond 2P: Sum R1 + R2 Inflow= 6.31 cfs 0.803 af
Primary= 6.31 cfs 0.803 af

Pond 3P: Total Post Devel. Runoff Inflow= 7.50 cfs 1.210 af
Primary= 7.50 cfs 1.210 af

Total Runoff Area = 13.125 ac Runoff Volume = 1.442 af Average Runoff Depth = 1.32"

Pond 1P: Pond 1

Inflow Area =	2.435 ac,	Inflow Depth = 3.10"		
Inflow =	13.01 cfs @	11.90 hrs, Volume=	0.629 af	
Outflow =	1.24 cfs @	12.27 hrs, Volume=	0.407 af,	Atten= 90%, Lag= 21.8 min
Primary =	1.24 cfs @	12.27 hrs, Volume=	0.407 af	

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 1,324.14' Storage= 17,979 cf
Plug-Flow detention time= 246.9 min calculated for 0.406 af (64% of inflow)

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,323.00	0	0
1,324.00	15,363	15,363
1,325.00	19,370	34,733

Primary OutFlow Max=1.24 cfs @ 12.27 hrs HW=1,324.13' (Free Discharge)
└─**1=Orifice/Grate** (Controls 0.90 cfs)
└─**2=Orifice/Grate** (Controls 0.34 cfs)

#	Routing	Invert	Outlet Devices
1	Primary	1,323.35'	**7.0" Vert. Orifice/Grate** C= 0.600
2	Primary	1,324.00'	**8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Pond 2P: Sum R1 + R2

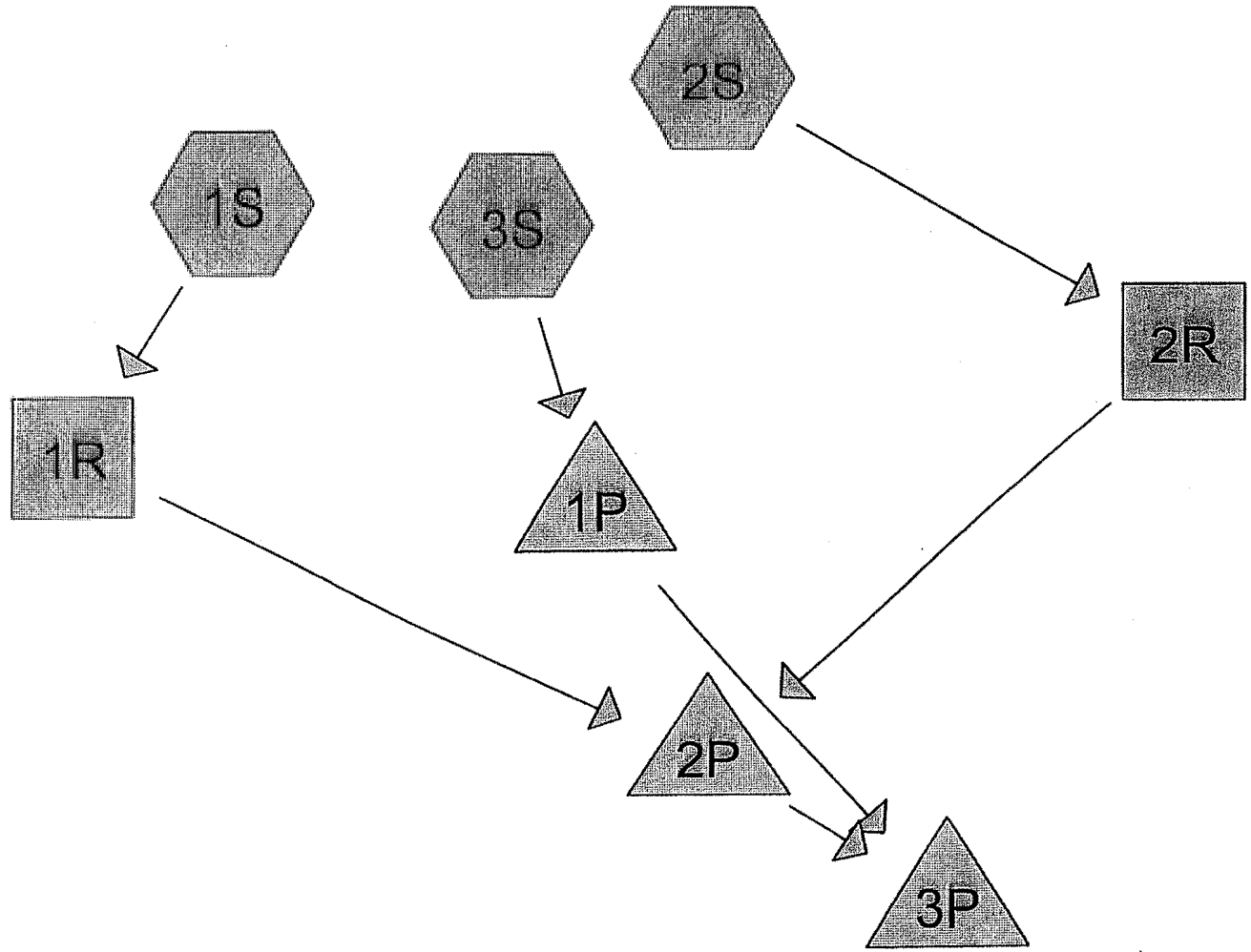
Inflow Area =	10.690 ac,	Inflow Depth = 0.90"		
Inflow =	6.31 cfs @	12.54 hrs, Volume=	0.803 af	
Primary =	6.31 cfs @	12.54 hrs, Volume=	0.803 af,	Atten= 0%, Lag= 0.0 min

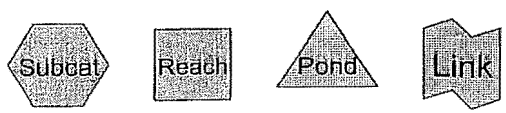
Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Pond 3P: Total Post Devel. Runoff

Inflow Area =	13.125 ac,	Inflow Depth = 1.11"		
Inflow =	7.50 cfs @	12.53 hrs, Volume=	1.210 af	
Primary =	7.50 cfs @	12.53 hrs, Volume=	1.210 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs





Drainage Diagram for Proposed 100-year storm
Prepared by the LA group, p.c. 3/7/2003
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Time span=1.00-20.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=4.80"
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC #1 Runoff Area=5.693 ac Runoff Depth=1.69"
Length=1,120' Tc=45.5 min CN=70 Runoff= 6.71 cfs 0.802 af

Subcatchment 2S: SC #2 Runoff Area=4.997 ac Runoff Depth=1.77"
Length=950' Tc=33.9 min CN=71 Runoff= 7.62 cfs 0.738 af

Subcatchment 3S: SC #3 Runoff Area=2.435 ac Runoff Depth=4.33"
Length=180' Tc=1.6 min CN=98 Runoff= 17.92 cfs 0.879 af

Reach 1R: R #1 Peak Depth= 0.96' Max Vel= 1.3 fps Inflow= 6.71 cfs 0.802 af
n=0.130 L=407.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 6.58 cfs 0.793 af

Reach 2R: R #2 Peak Depth= 1.04' Max Vel= 1.4 fps Inflow= 7.62 cfs 0.738 af
n=0.130 L=233.0' S=0.0200 '/' Capacity=7.06 cfs Outflow= 7.53 cfs 0.734 af

Pond 1P: Pond 1 Peak Storage= 23,968 cf @ 1,324.44' Inflow= 17.92 cfs 0.879 af
Primary= 2.27 cfs 0.640 af Outflow= 2.27 cfs 0.640 af

Pond 2P: Sum R1 + R2 Inflow= 12.98 cfs 1.527 af
Primary= 12.98 cfs 1.527 af

Pond 3P: Total Post Devel. Runoff Inflow= 15.16 cfs 2.167 af
Primary= 15.16 cfs 2.167 af

Total Runoff Area = 13.125 ac Runoff Volume = 2.420 af Average Runoff Depth = 2.21"

Pond 1P: Pond 1

Inflow Area =	2.435 ac,	Inflow Depth =	4.33"		
Inflow =	17.92 cfs @	11.90 hrs,	Volume=	0.879 af	
Outflow =	2.27 cfs @	12.08 hrs,	Volume=	0.640 af,	Atten= 87%, Lag= 10.7 min
Primary =	2.27 cfs @	12.08 hrs,	Volume=	0.640 af	

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 1,324.44' Storage= 23,968 cf
Plug-Flow detention time= 222.5 min calculated for 0.640 af (73% of inflow)

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,323.00	0	0
1,324.00	15,363	15,363
1,325.00	19,370	34,733

Primary OutFlow Max=2.27 cfs @ 12.08 hrs HW=1,324.44' (Free Discharge)
└─**1=Orifice/Grate** (Controls 1.15 cfs)
└─**2=Orifice/Grate** (Controls 1.12 cfs)

#	Routing	Invert	Outlet Devices
1	Primary	1,323.35'	**7.0" Vert. Orifice/Grate** C= 0.600
2	Primary	1,324.00'	**8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Pond 2P: Sum R1 + R2

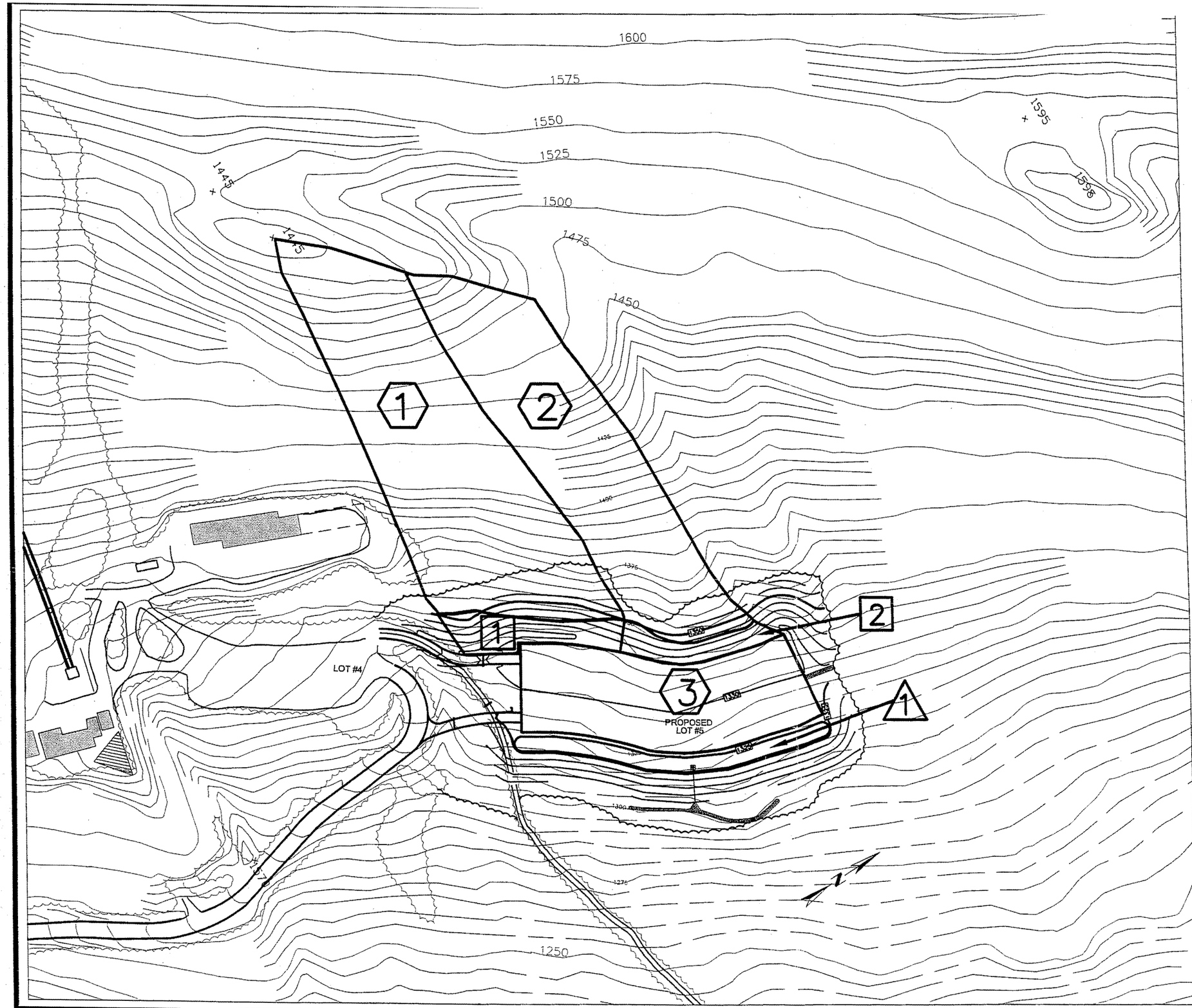
Inflow Area =	10.690 ac,	Inflow Depth =	1.71"		
Inflow =	12.98 cfs @	12.48 hrs,	Volume=	1.527 af	
Primary =	12.98 cfs @	12.48 hrs,	Volume=	1.527 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs

Pond 3P: Total Post Devel. Runoff

Inflow Area =	13.125 ac,	Inflow Depth =	1.98"		
Inflow =	15.16 cfs @	12.48 hrs,	Volume=	2.167 af	
Primary =	15.16 cfs @	12.48 hrs,	Volume=	2.167 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 1.00-20.00 hrs, dt= 0.05 hrs



WHITEFACE

Prepared For:

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
LAKE PLACID, NEW YORK

Prepared By:

SE GROUP® USA BELLEVUE, WA BURLINGTON, VT FRISCO, CO GREENWICH, CT HANOVER, NH PARK CITY, UT JAPAN TOKYO

the LA group Landscape Architecture and Engineering, P.C. 40 Long Alley Saratoga Springs New York 12866 518/587-8000 Fax: 518/587-0220

IZA Engineering & Planning Iran Zdradal Associates, PLLC

COMPREHENSIVE MANAGEMENT AND PLANNING REVIEW AND UNIT MANAGEMENT PLAN

100 0 50 100 200 400

Scale: 1" = 200'

Contour Interval = 5 Feet

NORTH

TITLE:

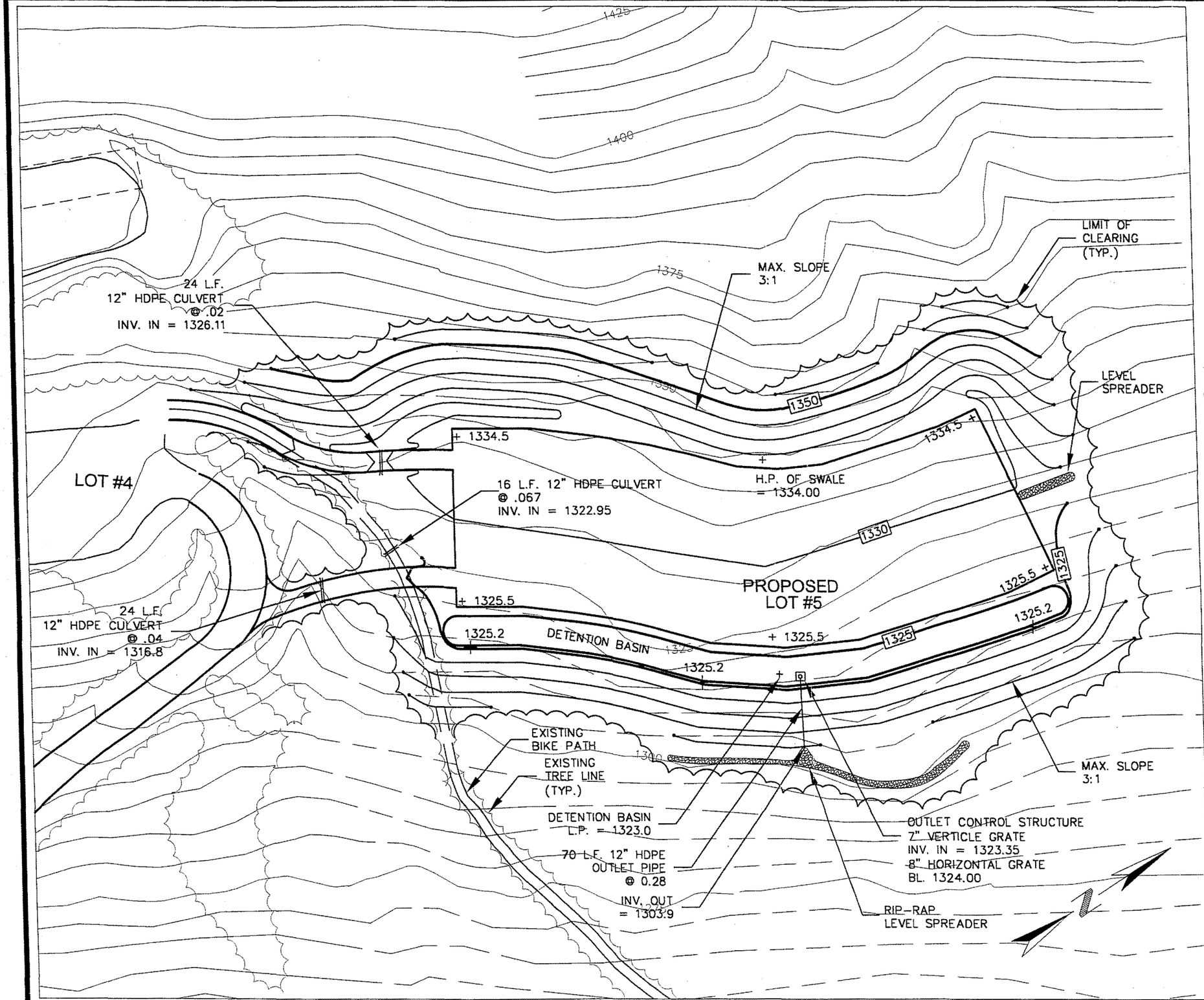
PROPOSED DRAINAGE PLAN

DATE: FEBRUARY 2003

FIGURE #: B

PROJECT NUMBER: 01102

FILE: [whiteface]



WHITEFACE

Prepared For:

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
LAKE PLACID, NEW YORK

Prepared By:

SE GROUP — USA: BELLEVUE, WA; BURLINGTON, VT; FRISCO, CO; GREENWICH, CT; HANOVER, NH; PARK CITY, UT; JAPAN: TOKYO

the LA group — Landscape Architecture and Engineering, P.C.

Ivan Zdralek Associates, PLLC — Engineering & Planning

COMPREHENSIVE MANAGEMENT AND PLANNING REVIEW AND UNIT MANAGEMENT PLAN

50 0 25 50 100 200
Scale: 1" = 100'
Contour Interval = 5 Feet
NORTH

TITLE:

PROPOSED LOT #5 GRADING & DRAINAGE PLAN

DATE: FEBRUARY 2003

FIGURE #: C

PROJECT NUMBER: 01102 | FILE: [whiteface]

APPENDIX Q

VINS STUDY WORK SCOPE

VERMONT INSTITUTE OF NATURAL SCIENCE

Evaluating the Use of Vermont Ski Areas by Bicknell's Thrush – Applications for Whiteface Mountain, New York

A proposal submitted to:
Olympic Regional Development Authority
218 Main Street
Lake Placid, NY 12946

Submitted by:
Christopher C. Rimmer
Conservation Biology Department
Vermont Institute of Natural Science
27023 Church Hill Road
Woodstock, VT 05091
802-457-2779 ext. 120
crimmer@vinsweb.org

Executive Summary: As part of the unit management plan and permitting process for the proposed Tree Island Pod expansion project on Whiteface Mountain, concerns have been raised about the impacts of construction and habitat alteration on Bicknell's Thrush *(Catharus bicknelli)*. The Vermont Institute of Natural Science (VINS) has studied the ecology and population dynamics of this species since 1995 on two Vermont ski areas, the Stowe Mountain Resort (Mt. Mansfield) and Stratton Mountain. VINS proposes to analyze its extensive data on ski area use by Bicknell's Thrush and to apply its findings as a means to assess potential impacts of the proposed Tree Island Pod project on Bicknell's Thrush. Data to be analyzed will include those on movements and behavior, nest site selection, reproductive success, and demography. Findings from Mt. Mansfield and Stratton Mountain will be compared between study areas within the developed part of each mountain and areas that are currently undeveloped for skiing. The final report will include recommendations for design, mitigation, and management measures that will minimize both short- and long-term potential project impacts to Bicknell's Thrush.

Project Cost:

Introduction and Justification: Among Neotropical migrant birds in the northeastern United States, Bicknell's Thrush *(Catharus bicknelli)* is ranked as the species most at risk of extinction, and thus of highest conservation priority, in the region (Rimmer et al. 2001a, 2001b). Bicknell's Thrush is also one of the least-known breeding species of eastern North America, a fact that has precluded its formal consideration for federal endangered or threatened status. At both ends of its migratory range, the species occupies a restricted, highly fragmented distribution and faces multiple habitat threats. One identified threat in the Northeastearn U.S. breeding range of Bicknell's Thrush is habitat loss and fragmentation from ski area development. Despite numerous ski area expansion projects in New England and New York during the past decade, no systematic evaluation of the effects of ski area development on Bicknell's Thrush has been made (but see Rimmer and McFarland 2000). A careful assessment of existing information is needed to guide future ski area development in the region, and to direct planning for site-specific proposals such as the Tree Island Pod project on Whiteface Mountain.

The Vermont Institute of Natural Science (VINS) has spearheaded ecological studies of Bicknell's Thrush in the Northeast since 1992. A key component of VINS' research has been focused investigations of the use by Bicknell's Thrush of two established Vermont ski areas, Stowe Mountain Resort (Mt. Mansfield) and Stratton Mountain. From 1995-2001, VINS conducted studies on three 10-20 hectare plots on Mansfield. One of these was in an area developed for skiing around the Octagon, the other two in areas of relatively undisturbed habitat on the Mansfield ridgeline and Ranch Brook watershed. On Stratton, VINS established two study plots in 1997 and has since annually collected field data on each. One plot is on the developed north peak, the other on the undeveloped south peak.

Field methods on both mountains have been standardized from year to year and have included: (1) constant-effort mist-netting and banding (including unique color banding of each individual thrush); (2) intensive resighting of color-marked individuals; (3) radio telemetry of adult males and females, and in 2001 on Mansfield of fledged juveniles; (4) videography at nests; (5) monitoring of nests and reproductive success; and (6) detailed characterization of vegetation and macrohabitat variables around nests. Each mountain thus provides a 7-year data base that can be used to examine within- and between-year variation in Bicknell's Thrush life history parameters on habitat blocks that are developed for skiing and on similar, undeveloped blocks. These data afford a valuable opportunity to address important questions, such as those posed by the Tree Island Pod project, relating to the impacts of ski area development on this species.

To date, constraints of funding have prevented VINS Conservation Biology staff from undertaking a complete analysis of these data. A preliminary analysis and summary through 1999 (Rimmer and McFarland 2000) suggested that, on Mt. Mansfield and Stratton Mountain, existing ski areas provide suitable Bicknell's Thrush nesting habitat and that nesting success did not significantly differ between developed and undeveloped areas. However, it must be emphasized that these findings should be considered tentative, as they were based on small sample sizes collected over a relatively short timeframe. VINS' recent discoveries of a complex, variable mating system and biannual patterns of reproductive success in Bicknell's Thrush underscore the need for more detailed analyses of data collected over the entire 1995-

2003 study period. Many questions remain about adult and juvenile survivorship, site fidelity and settlement patterns, daily and seasonal movements, behavior, nest site selection, reproductive success, and the influence of different habitat patch sizes and configurations. Understanding the extent to which these and related variables differ on ski areas and in undeveloped habitats is crucial to yield meaningful insights on how Bicknell's Thrush uses existing ski areas, and how the species might respond to proposed habitat modification. Such an assessment would require a significant investment of VINS staff time, but is feasible, especially as most data through 2002 have been computerized.

Methods: VINS proposes to undertake a detailed analysis of its 1995-2003 field data from Mansfield and Stratton. We further propose to report our findings in a summary document that will specifically relate them, to the extent possible, to the proposed Tree Island Pod project on Whiteface Mountain. Our analysis and evaluation will combine (1) site-specific information collected during a field visit by VINS Conservation Biology staff to the project area in the fall of 2003, (2) our examination of GIS and other existing data from the proposed project, and (3) our own ecological and behavioral field data from Mt. Mansfield and Stratton Mountain. We believe that this approach will enable us to generate predictions about likely short-term (1-2 years post-construction) and medium-term (3-5 years) impacts of the Tree Island Pod project on breeding Bicknell's Thrushes. More importantly, we plan to use our data to construct a generally applicable model of how Bicknell's Thrushes use habitat within developed ski areas, and how new construction and ongoing management can minimize impacts to, and in some cases enhance breeding habitat for, Bicknell's Thrush.

Our proposed analysis will consist of three primary components, each of which will be addressed and coalesced in the final report. Specifically, we propose to:

1. Analyze nest site selection by Bicknell's Thrush. VINS has monitored over 150 active nests on both mountains since 1995, distributed nearly equally on ski area and non-ski area plots. At each nest, we have collected a detailed series of data on nest location, vegetation, landform characteristics, and other site-specific variables. We have also collected comparable data at randomly selected "non-use" sites at a distance of 30 meters from each nest, for > 50% of the nests. These data will be used to develop a model of Bicknell's Thrush nest site selection in ski-developed areas versus undeveloped habitats. Using GIS vegetation data from Whiteface Mountain, this model will be applied to the Tree Island Pod project to generate predictions about the viability of the project area for Bicknell's Thrush nesting, both in its current condition and after the proposed development. Results may yield insights about measures that can be adopted to mitigate proposed habitat alterations, and ultimately to enhance Bicknell's Thrush habitat in the Tree Island Pod area. More generally, a model of nest site selection relative to ski area development should help guide future planning and conservation efforts at Whiteface Mountain and throughout the Northeast.
2. Analyze movements and behavioral ecology of Bicknell's Thrush. VINS has an extensive data set on movements of adult male and female Bicknell's Thrushes in both ski area and undeveloped habitats. Using radio telemetry, we have recorded daily movements and locations of approximately 50 individual adults for 4-6 week periods. In 2000, we also monitored post-breeding movements and habitat use of adults and

juveniles on Mansfield. Telemetry data will be plotted and analyzed on GIS maps of Mansfield and Stratton study areas, and related to various vegetation and terrain characteristics. Results will enable documentation of movements and home range characteristics relative to physical variables such as ski trail width, size and configuration of habitat islands, spacing and density of trails per unit area, and extent of gladed versus open trails. These results should provide valuable information about exactly how Bicknell's Thrushes use (or avoid) specific areas within ski areas. Findings from undeveloped habitats will provide a contextual baseline.

As a complement to telemetry data on movements and habitat use, videographic data on adult thrushes are available to examine behavioral attributes of birds on ski areas versus natural forest habitats. From 1998-2000 on Mansfield and 1998-2002 on Stratton, we videotaped all known nests during the chick-feeding stage. Because nearly all adult Bicknell's Thrushes were uniquely color-banded on each study plot, we have a large data set on the behavioral ecology of individual birds and nests. Preliminary analysis of these data has shown that Bicknell's Thrush has a very unusual and complex mating system. Remarkably, most nests are attended by 2-4 males, and paternity is almost invariably mixed in such nests. An important and unanswered question relates to the role of habitat and landscape features in shaping this complex, variable system. We propose to analyze our videotape data to examine behavioral differences among breeding thrushes on ski area versus undeveloped habitats. This will enable documentation of factors such as nest attentiveness of females, numbers of male feeders, quantity and types of food delivered to nestlings, and reaction to auditory or visual disturbance. Results could illuminate whether and how ski area fragmentation and activity influence adult behavior, and what variables may be most crucial determinants of any differences that exist. Again, findings could help mitigate proposed construction activities and suggest maintenance protocols that enhance habitat and/or minimize adverse impacts of nesting thrushes.

3. Analyze multi-year demographic data on Bicknell's Thrush. VINS has amassed an extensive data set on known-identity Bicknell's Thrushes, based on banding of adults and nestlings on Mansfield since 1995 and on Stratton since 1997. Using mark-recapture software, and incorporating data from original banding captures, within- and between-year recaptures, and resighting of color-banded individuals, we propose to construct a detailed species demographic profile. On both ski area and natural forest study plots, we will examine age- and sex-specific survivorship, reproductive success, site fidelity, population turnover, recruitment, and other key life history variables. We will also examine indices of individual health such as subcutaneous body fat, weight, feather wear, and mercury levels between the two habitat types. Mark-recapture analyses will further yield statistically robust estimates of population density, which are otherwise difficult to obtain. Results will provide a powerful tool to evaluate the population viability of Bicknell's Thrushes on existing ski areas compared to nearby relatively undisturbed montane forest. Documenting habitat features that influence nest success may provide important insights into designing the Tree Island Pod project so as to minimize potentially adverse impacts and/or enhance habitat suitability for successful breeding.

Expected Products and Outcomes: VINS will produce a detailed final report outlining its findings. This report will include results of the three component analyses described above, each presented and interpreted independently, as well as in relation to one another. There is likely to be considerable overlap in how findings from any one analysis contribute to an overall understanding of how Bicknell's Thrushes use ski areas in general, and to specifically evaluating potential impacts of the Tree Island Pod project. Findings will be presented in a technically robust, statistically defensible, and completely objective manner. We will make a special effort to limit use of technical jargon, realizing that some of our proposed analyses involve sophisticated methods. While methods will be presented in sufficient detail to justify their use, we will provide non-technical summaries of our findings, and we will attempt to interpret them clearly. It must be emphasized, however, that ecological data do not invariably yield unambiguous results, regardless of the rigor with which the data were collected, so answers to some questions addressed by our analyses may not be unequivocal. In such cases, we will highlight the weaknesses of our conclusions and carefully interpret them in light of the specific situation.

A key element of our final report will be a section that presents specific recommendations for designing and implementing the Tree Island Pod project so as to minimize potential short- and long-term impacts to Bicknell's Thrush. Included will be guidelines for trail design and construction, retention or creation of features that may enhance habitat or mitigate habitat loss/alteration elsewhere, daily and seasonal timing of construction activities, post-construction habitat maintenance, opportunities for conservation education of visitors to Whiteface Mountain throughout the year, and general operational procedures. Where possible, we will reference specific sites within the Tree Island Pod project area, but many of our recommendations are likely to apply more generally to the entire project area than to discrete locations within it.

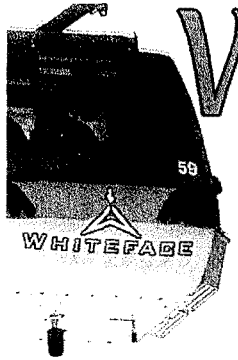
Timeframe: We have carefully assessed the amount of staff time that we believe will be necessary to complete these analyses and to prepare a final report. We conservatively estimate three full months of work by one VINS Conservation Biology FTE staff person (in reality, three VINS staff will be involved with various aspects of this proposed work). Because of our numerous other responsibilities at VINS, a completion date earlier than 15 April 2004 is not feasible. We therefore propose to begin the above analyses on 1 September 2003 and to deliver a final report to ORDA no later than 15 April 2004.

Budget:

Staff time: 12 weeks @ $1000 ($25/hr)	$12,000
FICA and benefits (20%)	$2,400
Site visit to Whiteface Mountain (Sept 2003): 285 mi x $0.35	$100
Office supplies, phone/fax, computer support	$500
Total	**$15,000**

APPENDIX R

WHITEFACE WILDLIFE BROCHURE



WHITEFACE WILDLIFE

Nature and Animal Guide to Whiteface Mountain

THE RIDE UP

As you ride to the top of Little Whiteface, look for alternating bands of live and dead balsam fir on Whiteface Mountain. These areas are called "fir waves." The waves on Whiteface Mountain have been studied by scientists worldwide.

Fir waves develop when winter winds sweep up the mountain. These winds are laden with tiny ice crystals that gradually kill the first tree needles and branches they hit. Leeward trees (which on Whiteface are upslope) are protected from the wind.

As you ride the gondola up the mountain, you will notice a gradual transition in the forest from broadleaf trees (primarily sugar maple, American beech, and yellow birch) to needle-leaf trees (primarily balsam fir and red spruce) mixed with mountain and paper birch (which are distinguished by their bright white bark). This change occurs because at higher elevations summers are cooler and cloudier, and winters are colder and windier, than seasons in the valley. At the summit look for trees that have grown above the surrounding tree canopy, and note how they are "flagged," meaning their upwind branches have been killed and broken away by blasting ice-filled winds.

The summit of Little Whiteface (3,676 ft.) is about 2,500 feet above the gondola base station (1,220 ft.). So the uphill gondola ride is like traveling 500 miles north.

And you don't even have to go through customs.

THE ADIRONDACK FOREST PRESERVE

The diverse system of State lands in the Adirondack Mountain region of New York is known collectively as the Adirondack Forest Preserve. Along with similar lands in the Catskills, the Adirondack Forest Preserve was created in 1885 by an act of the New York State Legislature.

It was the culmination of a preservation movement that grew out of concern about widespread tree cutting to support the lumber, paper, leather tanning, and iron mining industries in the Adirondacks that began in earnest in the 1850's. Preservation advocates like Verplanck Colvin, Charles Sprague Sargent, and Franklin B. Hough championed the protection of the Adirondack region as a vast public park.

In the words of the New York State Constitution:

"The lands of the state, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed."

The Adirondack Forest Preserve has grown over the past century to more than 2.6 million acres including Whiteface, making it the largest complex of wild public lands in the eastern United States.

Today the Forest Preserve is still important for protecting the headwaters of many of New York's major rivers. As an undisturbed natural landscape, it is a haven for a host of distinctive plants, fish, and wildlife, some of which live nowhere else in the state.

The ***white-tailed deer*** is named for its most distinctive feature, the large white tail or "flag" that is often all you see as the animal bounds away through tall grass. The color of the deer's upper body and sides changes with the season, from a generally reddish-brown in summer to buff in winter. Its belly and the underside of its tail are completely white, and it has a white patch on the throat.

Fawns are born in late spring and summer and by early November a male fawn weighs about 85 pounds and a female about 80 pounds. Yearling bucks average 150 pounds, while does of the same age average about 20 percent less, or about 120 pounds. Some older bucks weigh 200 pounds or more when field dressed (about 250 pounds live weight). The deer sheds its hair twice a year, its heavy winter coat giving way to a lighter one in spring which is replaced again in early fall. A fawn's coat is similar to the adult's but has several hundred white spots which gradually disappear when the deer is three to four months old. Large "typical" bucks can have seven or more points on a side.

Ursus americanus is one of the most familiar wild animals in North America today. To many campers it is both a nuisance and an exciting part of their outdoor experience. Believe it or not, there are visitors to national parks, like the Adirondack Park, that are disappointed if they fail to catch a glimpse of a bear.

Black bears are members of the family Ursidae, which has representatives throughout most of the northern hemisphere and in northern South America. Other members of this family that occur in North America are grizzly bears and polar bears. Both of these species are considerably larger than the black bear.

Widely distributed in North America, the black bear occurs from the east to the west coast, as far north as Alaska and as far south as Mexico. It is not found on Prince Edward Island, in Southern Saskatchewan, or in Southern Alberta.

GOVERNOR DESIGNATES THREE NEW BIRD CONSERVATION AREAS

Governor George E. Pataki announced the designation of three new Bird Conservation Areas (BCA's), expanding the state's effort to protect critical habitats that are essential to supporting diverse and endangered bird populations.

The Adirondack Sub-alpine forest BCA is comprised of summits above 3,000 feet in the Adirondack High Peaks Wilderness Area, covering approximately 69,000 acres of land. The area includes dense, sub-alpine coniferous forests, including thickets of stunted and young balsam fir and red spruce, which provide critical habitats and nesting areas for Bicknell's Thrush, a species of special concern, as well as the Blackpoll Warbler and Swainson's Thrush. DEC will maintain existing management practices for these lands, while also studying the effects of human visitation/intrusion and elements such as acid rain on nesting seasons.

The Bird Conservation Area program was signed into law by Governor Pataki in September 1997. Modeled after the National Audubon Society's Important Bird Areas Program, the law authorizes the commissioners of DEC, State Department of State (DOS), and the State Office of Parks, Recreation and Historic Preservation (OPRHP) to designate areas of state lands and waters that are particularly important to bird conservation.

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
NEW YORK

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
GEORGE E. PATAKI, GOVERNOR
CHARLES A. GARGANO, CHAIRMAN
TED BLAZER, PRESIDENT/CEO

If you see these or any other Adirondack wildlife, please tell your lift attendant. They are logging wildlife sightings and will add yours to the list. Thank you for your help.

Department of Environmental Conservation

Adirondack parkagency

HIS BROCHURE IS PRODUCED BY ORDA IN CONJUNCTION WITH THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND THE ADIRONDACK PARK AGENCY

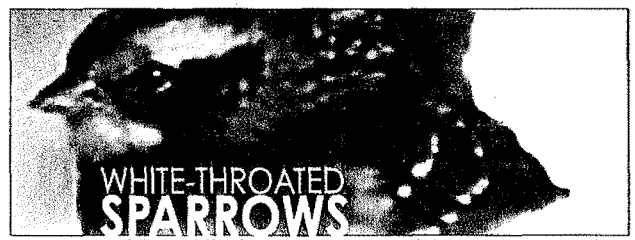
The coyote has been present in New York State for about 70 years. As with its western cousin, the eastern coyote has been the object of much controversy as well as curiosity.

The eastern coyote is considerably larger than its southwestern cousin. The largest individuals are as big as smaller timber wolves. Adults may range from 35-45 pounds and some large males may exceed 50 or 60 pounds in body weight.

Eastern coyotes have a German shepherd-like appearance, which sometimes leads to confusion about their identity. Typically-colored coyotes are grizzled gray on their back, upper sides and neck. This distinguishes them from most dogs, which are usually a solid color. A small percent are black or reddish-blond, the latter being the more common deviation. Coyotes can be distinguished from most dogs based on their habit of carrying their tail at or below a horizontal level when traveling. At a distance it is more difficult to tell coyotes from wolves, but up close, wolves have a more massive head, less pointed muzzle and ears, and larger feet.

The peregrine falcon (Falco peregrinus) is a majestic bird of prey, with slate blue upper parts and cream-colored underparts. Its underparts are distinguished by horizontal black barring and spotting. The peregrine's elegant head pattern makes this species very distinctive, even from a distance. Male peregrines weigh an average of 611 grams and females 952 grams. The peregrine falcon once bred throughout Canada. However its range has become much more restricted in recent years as populations have undergone declines. North American peregrines from areas in the northern United States, southwestern British Columbia, and southern Ontario winter in such places as — the coast of the Gulf of Mexico, Latin America and South America.

Note: Located along Route 86 west of Whiteface Mountain in the ledge area known as the "Notch," one will find a home to this magnificent falcon.



The song of the **White-throated Sparrow** is known to many by the mnemonic Old Sam Peabody. It is a long, clear whistle starting with one or two low tones, followed by three or four higher wavering tones. On the breeding grounds in brushy or semi-open mixed woods, males sing throughout the day, especially early in the morning and again at dusk.

The strikingly patterned head has a central white crown stripe and supercilium (both of which are pale tan in tan-striped birds), separated by a black (or dark brown) lateral crown stripe. The supercilium is yellow in front of the eye. Below the supercilium is a thin black or dark brown eye stripe. The throat is white, sharply delineated from the gray cheek and upper breast by a very thin black moustachial stripe and lower edge. The back and slightly notched tail are brown, and the rump is gray brown and faintly streaked. The wings are brown with two narrow whitish wingbars. The belly is dull white and unstreaked. The bill is horn-colored (dark tan), and the legs are pale pinkish brown.

Size of a large sparrow, olive-brown back, buffy throat, gray-to-white underparts with chin and flanks spotted with blackish spots. Can be distinguished from the Gray-cheeked Thrush by its size (Bicknell's is considerably smaller) and a longer yellow color at the base of the lower bill. A chestnut coloring on the upper tail is evident in most Bicknell's Thrushes.

The breeding range extends from New York's Catskill Mountains north to the lower north shore of the Gulf of St. Lawrence and east to Cape Breton Island in Nova Scotia. The habitat is almost exclusively in montane forests, primarily those dominated by stunted balsam fir and red spruce at elevations ranging from 450 meters (1450 feet) in Cape Breton to more than 915 meters (3000 feet) in Vermont. These high elevation forests consist of nearly impenetrable thickets on steep, rugged slopes. Bicknell's appears to prefer the dense regenerating growth that often characterizes the edges of ski slopes and mountain roads.

Whiteface Mountain is currently studying the Bicknell's Thrush in conjunction with several interested environmental groups

APPENDIX S

LITTLE WHITEFACE CLOUDSPLITTER LODGE
(Conceptual Only, Not Proposed at This Time)

Lodge Site Photograph 1:

View to the west showing existing building to be replaced on Little Whiteface. Note Pump House building on the right to remain. Note Gondola unloading station to the left. Existing observation deck is located to the left, beyond the Ski Patrol building.

Lodge Site Photograph 2:

View to southwest of two lift unloading stations on Little Whiteface. Little Whiteface Quad Chairlift is to the left, and the Cloudsplitter Gondola unloading station is to the right. New lodge to be placed to the right.

Lodge Site Photograph 3:

View to the east showing existing Ski Patrol building to be replaced is located to the right. Little Whiteface Quad unloading station is to the right. Ski trail directional sign is located to the left. The proposed lodge to replace the existing Ski Patrol building will be set back from the topographic edge of Little Whiteface in order to minimize the potential visibility of the structure.

Lodge Site Photograph 4:

View from Cloudsplitter Gondola unloading station to the west to the existing observation deck.

Lodge Site Photograph 5:

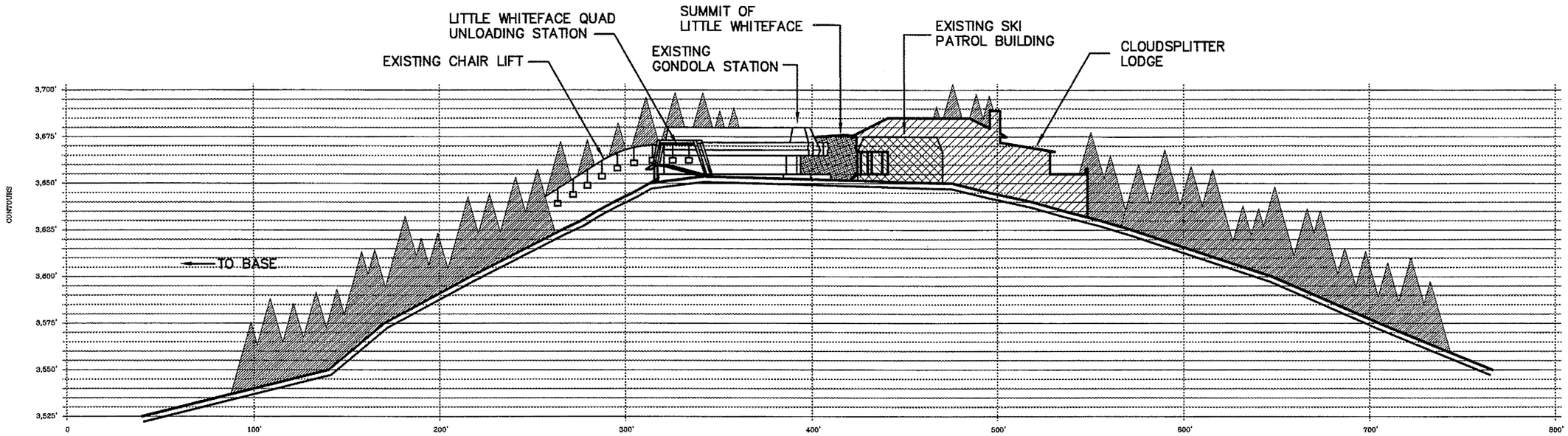
View from existing observation deck to the east of the existing Ski Patrol building and the two lift unloading stations at the top of Little Whiteface.

Cloudsplitter Gondola Towers Photograph 6:

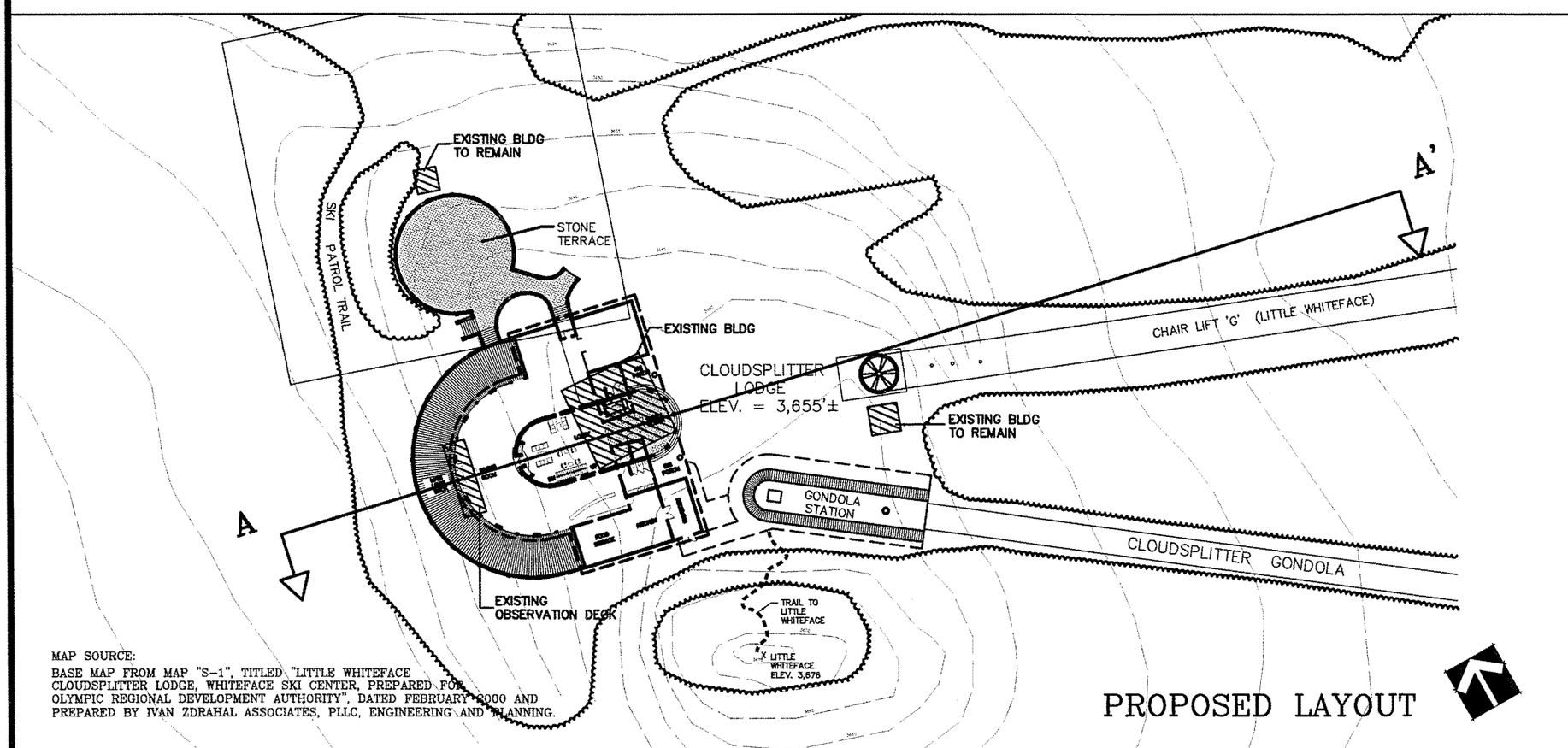
Photograph taken looking west, ascending the Gondola. A portion of the Gondola unloading station is an element in the view at the base of the topmost tower. The new lodge will be located behind and to the west of the existing Gondola unloading station, and will not be visible.

Cloudsplitter Gondola Towers Photograph 7:

Photograph taken looking west, with Little Whiteface Mountain located in the center. The Cloudsplitter Gondola lift line clearing and topmost towers are visible in the context of the existing Ski Center. The new lodge will be located further to the west and away from the topographic edge of the mountain and will not be visible.



SECTION–ELEVATION A–A'



MAP SOURCE:
BASE MAP FROM MAP "S-1", TITLED "LITTLE WHITEFACE CLOUDSPLITTER LODGE, WHITEFACE SKI CENTER, PREPARED FOR OLYMPIC REGIONAL DEVELOPMENT AUTHORITY", DATED FEBRUARY 2000 AND PREPARED BY IVAN ZDRAHAL ASSOCIATES, PLLC, ENGINEERING AND PLANNING.

PROPOSED LAYOUT

Prepared For:
OLYMPIC REGIONAL DEVELOPMENT AUTHORITY
LAKE PLACID, NEW YORK

COMPREHENSIVE MANAGEMENT AND PLANNING REVIEW AND UNIT MANAGEMENT PLAN

30 0 30 60 120
Scale: 1" = 60'
Contour Interval = 5 Feet

TITLE:
LITTLE WHITEFACE CLOUDSPLITTER LODGE
CROSS–SECTION

DATE: OCTOBER 26, 2002
OCTOBER 4, 2002
FIGURE:

PROJECT NUMBER: 01011
FILE:

CAD DWG. FILE NAME: CLOUDSPLITTER.DWG

FEASIBILITY ANALYSIS REPORT

LITTLE WHITEFACE
CLOUDSPLITTER LODGE
WHITEFACE SKI CENTER

PREPARED FOR:

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

JANUARY 28, 2000

PREPARED BY

IVAN ZDRAHAL ASSOCIATES, PLLC
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- **ENGINEERING AND PLANNING**
  Ivan Zdrahal Associates, PLLC
  Engineering and Planning
  959 Route 146
  Clifton Park, NY 12065
  Contact: Ivan Zdrahal, P.E.
  (518) 383-0769

- **ARCHITECTURAL**
  TruexCullins & Partners Architects
  209 Battery Street
  Burlington, VT 05401
  Contact: Rolf Kielman, AIA
  (802) 658-2775

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Appendix D: Construction Management Company Evaluation

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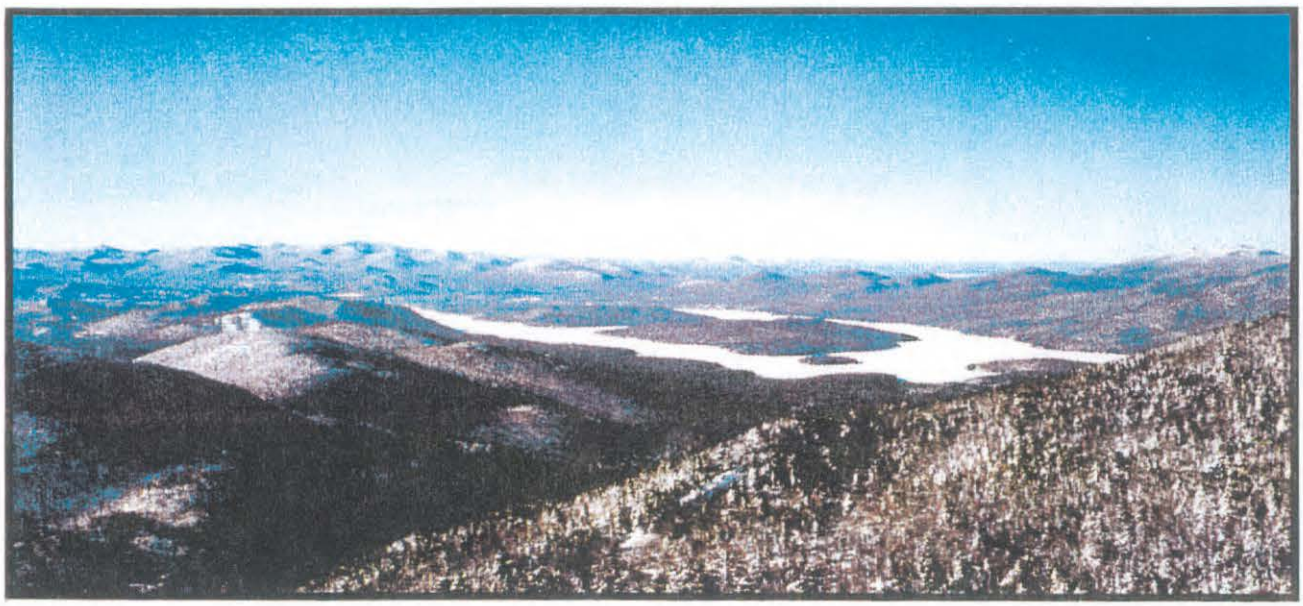
Appendix F Proposal for Development of Groundwater Source of Potable Water

Appendix G Product Information

1. INTRODUCTION

This study presents results of a several month long process of evaluating and assessing various ideas and approaches for the planning of Cloudsplitter Lodge near the top of Little Whiteface.

It was recognized by everyone involved in the planning process, that a day lodge on top of Little Whiteface in connection with the present new gondola lift will be one of the most desirable year-around destination points on the mountain. The proposed site near the top of Little Whiteface is a special place. With unsurpassed panoramic mountain views it will offer everyone an opportunity to see the beauty of these mountains throughout the year.



Realization of this plan will require considerable resources but its lasting benefit in terms of long-range future enjoyment for everyone will certainly make it a worthwhile public investment.

It was a great pleasure to work on this project because of my personal knowledge of this mountain and the people associated with it. I want to thank everyone who provided assistance and suggestions.

2. BUILDING FUNCTION, SPACE/CAPACITY ALLOCATION

The Unit Management Plan identified the following seating capacity and guest services upgrades as follows:

- Little Whiteface: Restaurant with 200 seats at a time when gondola lift is constructed

To assure a satisfactory level of guest service at the proposed Little Whiteface Day Lodge, it is felt that the proposed 200-seat capacity will not be adequate and it should be expanded. The presented plan is for a restaurant/cafeteria on the first floor level and a bar/lounge on the second level. In addition to the restaurant function of this building, the building will also provide space for the Ski Patrol and First Aid which will be located on the basement level of the building.

We estimate that the space in the day lodge will be allocated as follows:

Function	Area (SF)	Seating Capacity
Circulation Areas	2,000	---
Restaurant/Cafeteria	4,300	275
Bar/Lounge	1,900	80
Kitchen Space/Scramble	2,000	---
Storage/Mechanical	1,000	---
Restrooms	500	---
Ski Patrol/First Aid	800	---
Observation Decks	4,500	---
Storage Space	1,000	

The use of the building will be year-round with guest services provided during the normal daytime operations. However, it will also offer an opportunity to provide services for special functions (wedding, conferences, etc.). The convertibility of the interior space for such functions will be an important design factor which will need to be addressed in the final design phase.

With a projected turnover of 3 persons per seat, the potential daily number of guests served by this facility is estimated at 1,000.

3. BUILDING DESIGN

The building orientation and its design elements will maximize views and convenience of access to all functional elements. Outside decks will be in areas for maximum enjoyment of views and sun and sited in such a way as to prevent areas where wind would deposit excessive drifts.

The roof top observation deck will offer a 360° panoramic view of the mountains.

Due to the high wind exposure of the building site, the exterior of the building will consist of durable maintenance-free materials (stone, concrete, metal) with special high wind-resistant windows.

A large fireplace located in the center core of the building will provide an interior focal point.

The proposed improvements will provide for a sheltered pedestrian and service connection from the gondola station. In fact, consideration should be given to enclose the entire gondola station completely to make its operation safer and more trouble-free during the periods of severe weather conditions.

The building elevation will follow closely the existing mountain ridge to reduce visual impact on the view shed from Lake Placid Lake.

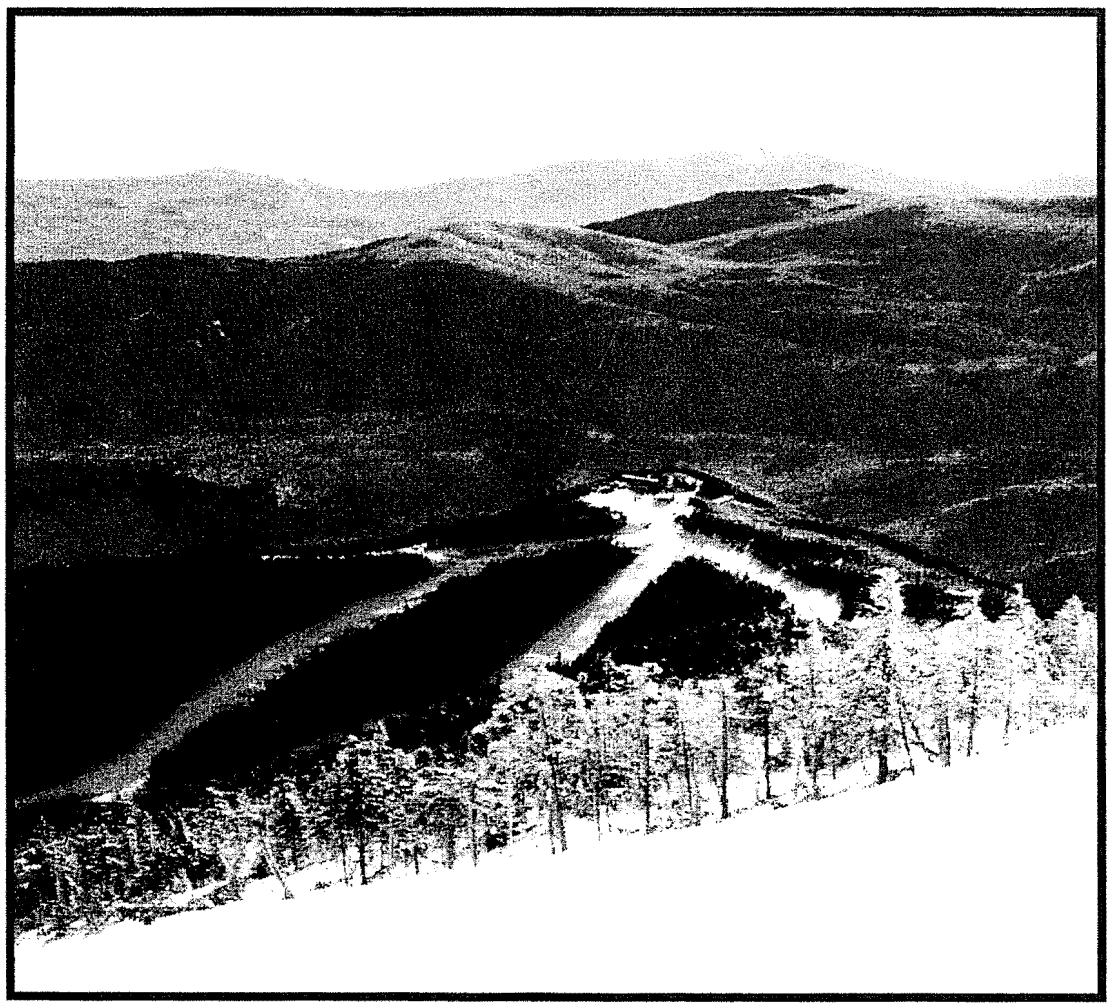
Reference: Appendix A, Architectural Plans
Appendix B, Site Plan

4. SITING

The proposed building will be located adjacent to the existing gondola station and in the area of the existing observation deck and ski patrol building, both of which will be removed.

The building will be anchored to the bedrock. Its layout will utilize the existing sloping ground of the site for the proposed two-floor and walkout basement level layout.

Reference: Appendix A, Architectural Plans
Appendix B, Site Plan



5. UTILITIES SERVICE

5.1 Water Supply

Two alternatives are available for providing development of water supply for the lodge.

Alternative A – Drilled Well

This alternative would involve undertaking a hydrogeological study to establish potential sites for drilling. After a development of a well with adequate yield, a piping will need to be constructed from the well to a storage tank at the lodge site.

Alternative B – Filtration of Water from Ausable River

Water from Ausable River will be pumped through the existing snow-making lines to a storage tank near or within the day lodge building. Filtration equipment will be installed to produce potable water of acceptable quality as approved the New York State Department of Health. Before this alternative is given a serious consideration, a determination will need to be made that the Ausable River water is treatable.

Reference: Appendix C, Study Map
Appendix F, Proposal for Development of Groundwater Source of Potable Water
Appendix G, Product Information

5.2 Wastewater Disposal

To provide a safe, reliable and environmentally safe wastewater disposal system will be a considerable challenge. A soil investigation conducted during the summer revealed one suitable site located in the existing gravel pit near Lift 7.

It is suggested that a grinder pump will convey wastewater from the lodge through a steel pipe to this disposal area. Where pipe could not be buried below frost level due to rock conditions, an aboveground insulated pipe with a tracer wire will be required.

The wastewater disposal system will need to satisfy design criteria of the New York State Department of Environmental Conservation and its operation will require a SPDES permit. Every effort will need to be made to minimize water consumption at the lodge to control the size of this wastewater disposal system.

For informational purposes we are including in this study data on composting toilets. This alternative was investigated as a possible solution for wastewater disposal. Since composting toilets cannot handle grey water, we feel that its use is not appropriate for this installation with the presented functions.

Reference: Appendix C, Study Map
Appendix E, Soil Report
Appendix G, Product Information

5.3 Electric, Telephone

Adequate electric and telecommunication service exists at the site of the proposed lodge building.

6. FIRE PROTECTION

To ensure adequate fire protection for the lodge building, adequate water storage will need to be constructed in order to satisfy fire flow for a predetermined time period. The water storage facility will also be used in conjunction with the building's potable water system. It will be located underground within the building or in the outside area. Outside location will require adequate cover for frost protection.

7. PROJECT DEVELOPMENT SCHEDULE

The presented project development schedule assumes occupancy by Thanksgiving 2001. In order to accomplish that, the following schedule of project development should be considered.

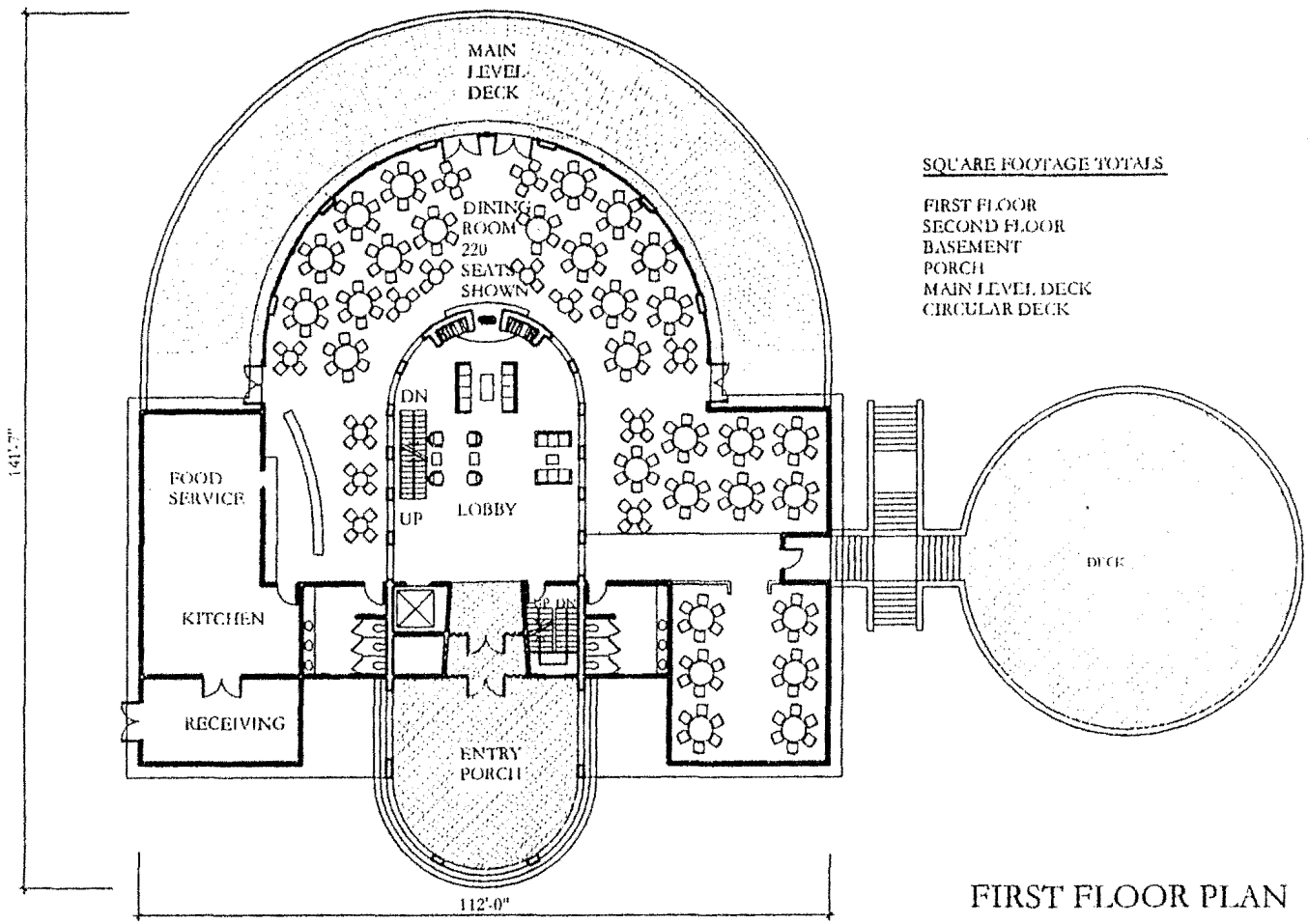
- Complete design and construction document by October 28, 2000.
- Advertise for construction bid by November 27, 2000.
- Award contract by December 22, 2000.
- Commence construction period by January 15, 2001.

This is a very challenging and demanding schedule. To achieve a better end product it is strongly recommended that completion of the building be done in phases.

- Phase 1 completion: Thanksgiving 2001
- Phase 2 completion: Summer 2002

APPENDIX A

ARCHITECTURAL PLANS



SQUARE FOOTAGE TOTALS

FIRST FLOOR	8300SF
SECOND FLOOR	1860SF
BASEMENT	4000SF
PORCH	950SF
MAIN LEVEL DECK	3200SF
CIRCULAR DECK	2450SF

FIRST FLOOR PLAN

LITTLE WHITEFACE CLOUDSPLITTER LODGE

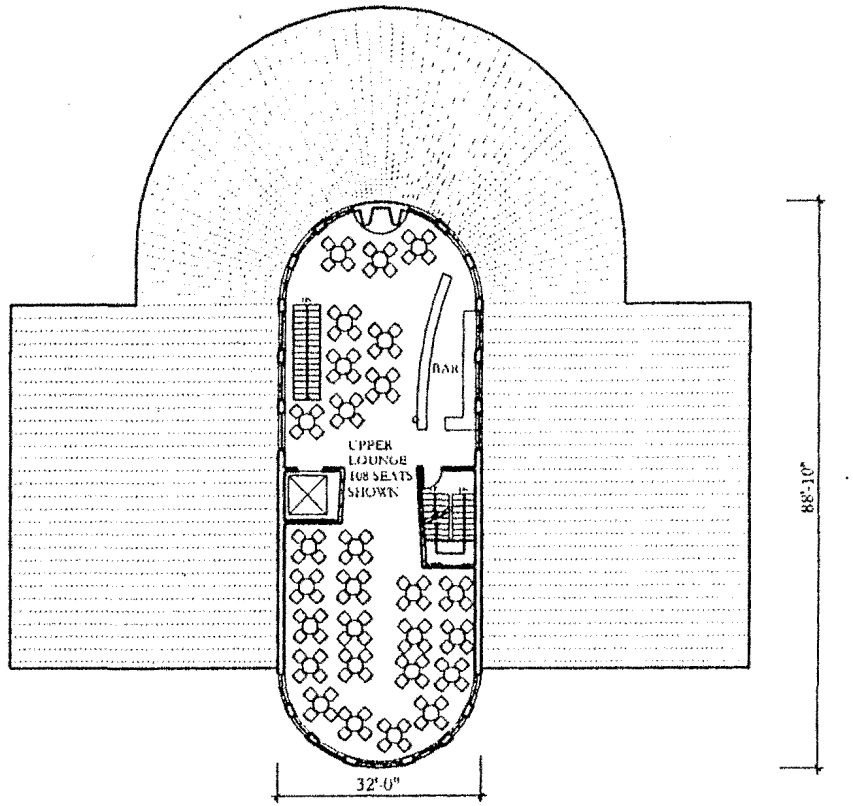
1

WILMINGTON
SCALE: 1"= 30'

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

NEW YORK
FEBRUARY 2, 2000

IVAN ZDRAHAL ASSOCIATES
TRUEX CULLINS & PARTNERS ARCHITECTS



SECOND FLOOR PLAN

LITTLE WHITEFACE CLOUDSPLITTER LODGE

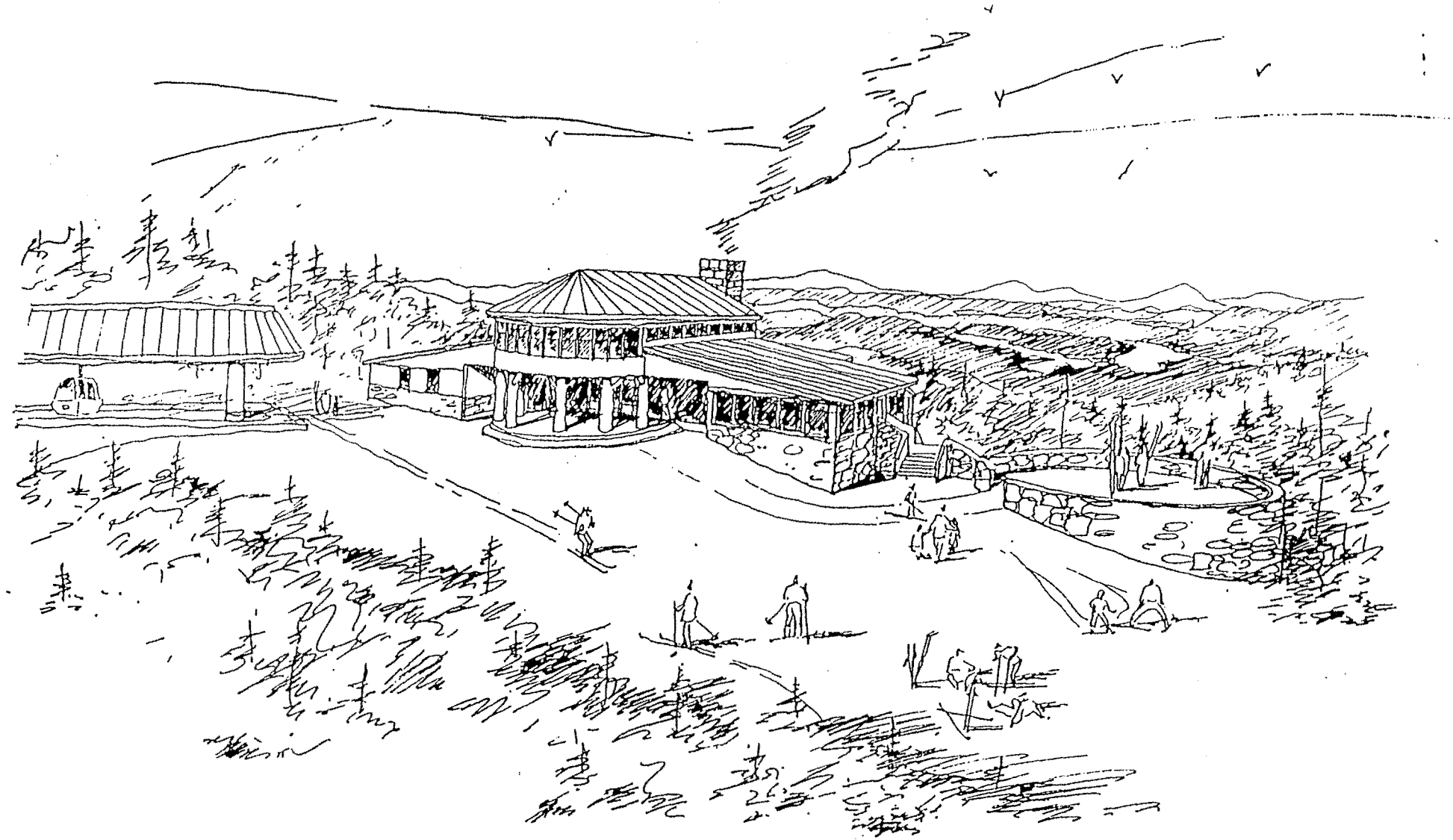
2

WILMINGTON
SCALE: 1"= 30'

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

NEW YORK
FEBRUARY 2, 2000

IVAN ZDRAHAL ASSOCIATES
TRUEX CULLINS & PARTNERS ARCHITECTS



PERSPECTIVE

LITTLE WHITEFACE CLOUDSPLITTER LODGE

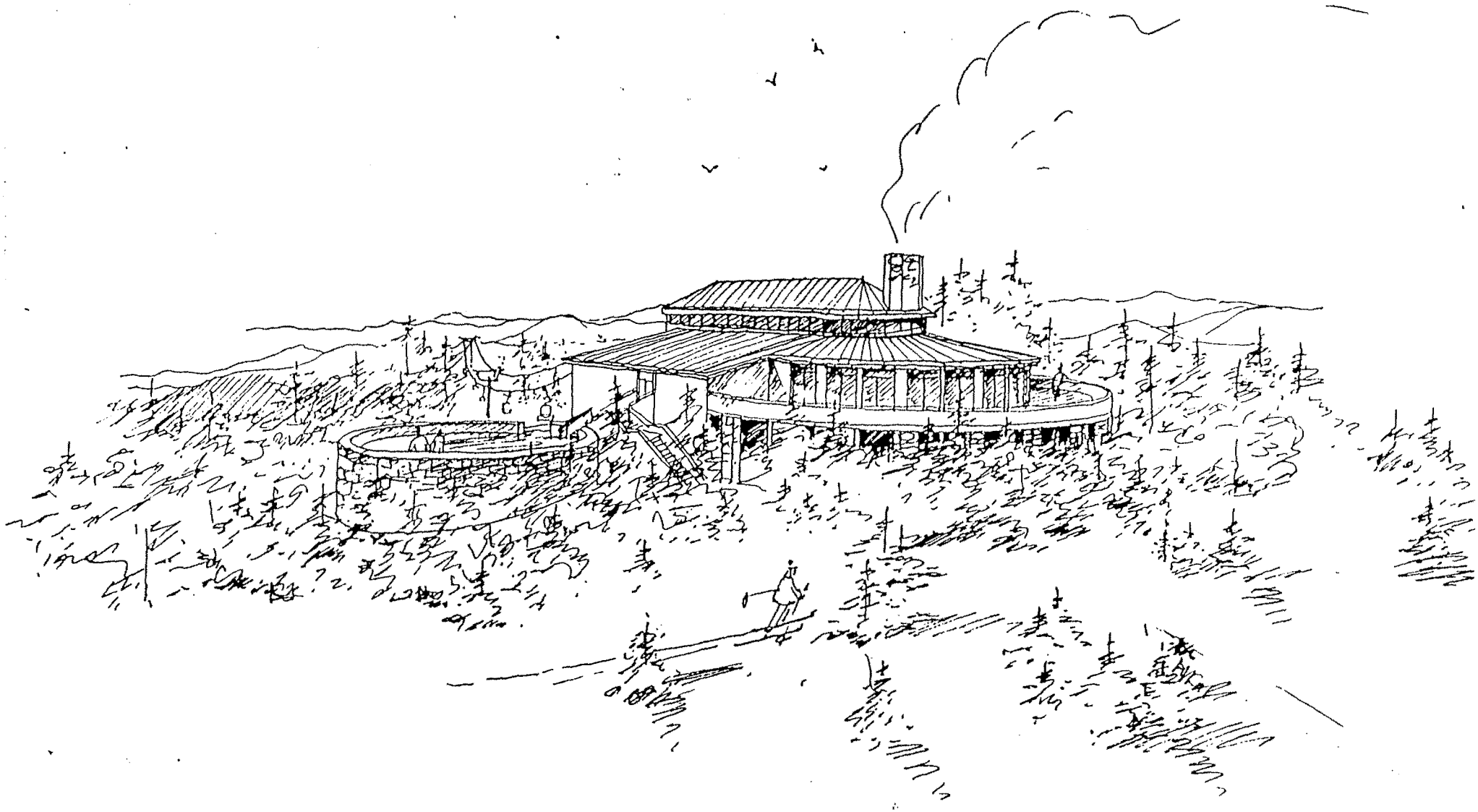
3

WILMINGTON

OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

NEW YORK
FEBRUARY 2, 2000

IVAN ZDRAHAL ASSOCIATES
TRUEX CULLINS & PARTNERS ARCHITECTS



PERSPECTIVE

LITTLE WHITEFACE CLOUDSPLITTER LODGE

4

WILMINGTON

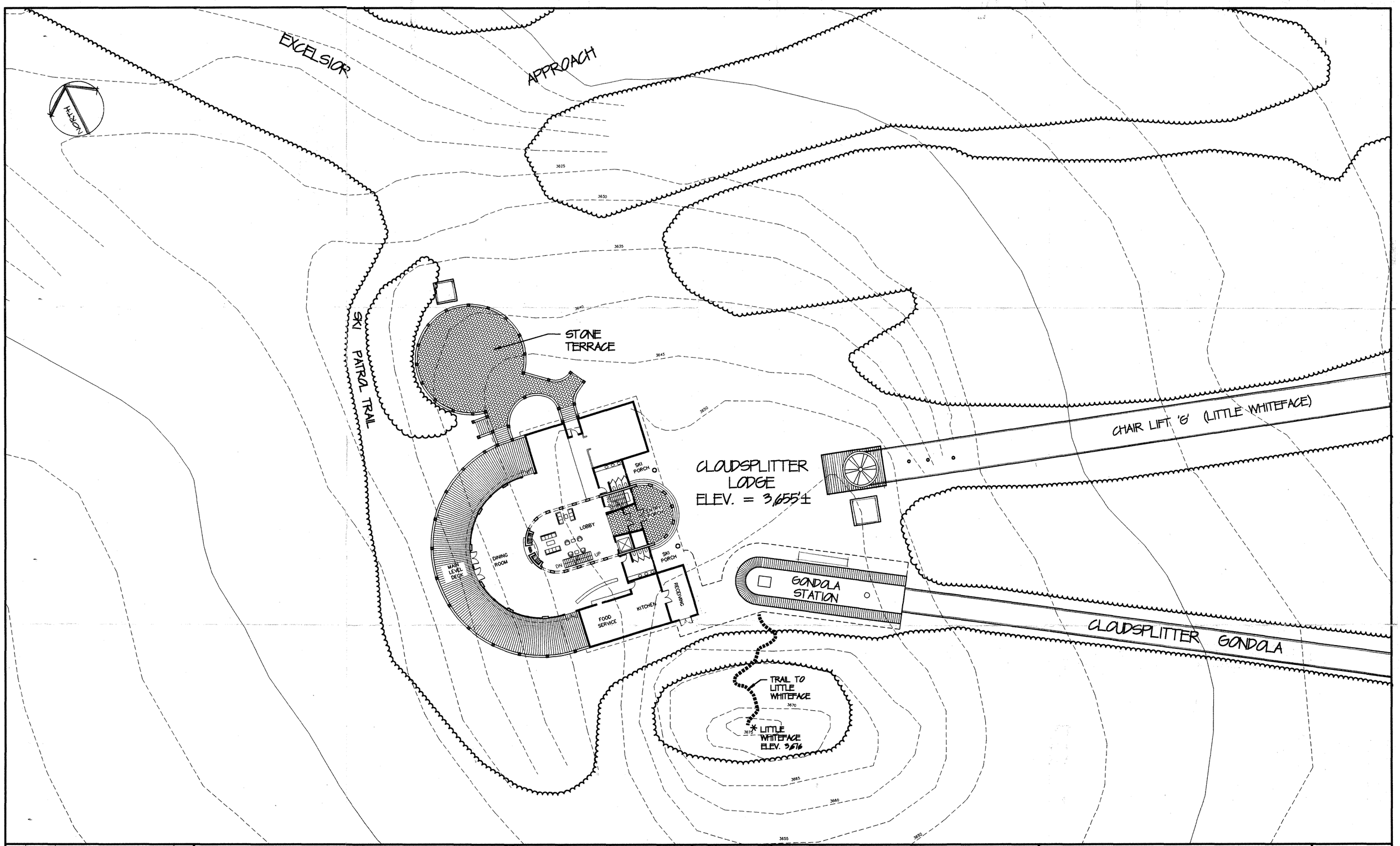
OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

NEW YORK
FEBRUARY 2, 2000

IVAN ZDRAHAL ASSOCIATES
TRUEX CULLINS & PARTNERS ARCHITECTS

APPENDIX B

SITE PLAN



RECORD OF WORK

ISSUED APR 11 2001
Ivan Zdrahal Associates

IVAN ZDRAHAL
LICENSE NO. 55,307

IVAN ZDRAHAL ASSOCIATES, PLLC
ENGINEERING AND PLANNING
959 ROUTE 146
CLIFTON PARK, NEW YORK 12065
PHONE : (518)383-0769 FAX : (518)371-4356
email : Zdrahal@aol.com

LITTLE WHITEFACE
CLOUDSPLITTER LODGE
WHITEFACE SKI CENTER
PREPARED FOR
OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

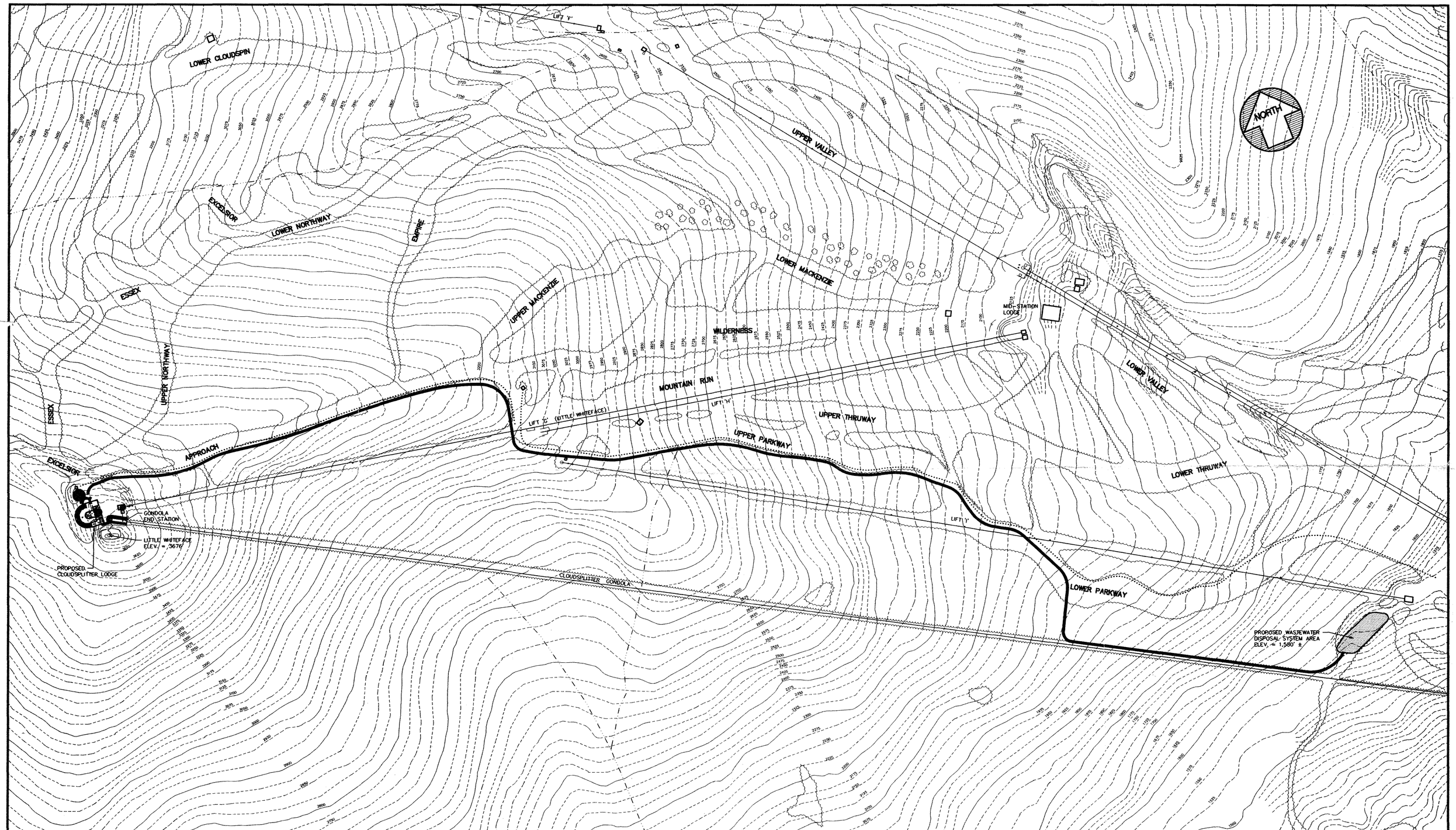
TOWN OF WILMINGTON — ESSEX COUNTY, NEW YORK

DATE: FEBRUARY 2000 | SCALE: 1" = 20' | SHEET 1 OF 1 | MAP NUMBER: 00-02-L

S-1

APPENDIX C

STUDY MAP



RECORD OF WORK

..... DENOTES EXISTING SNOWMAKING LINE

▬▬▬ DENOTES PROPOSED WASTEWATER DISPOSAL SYSTEM LINE
APPROX. LENGTH = 7000 L.F.

ISSUED APR 11 2001
Ivan Zdrahal Associates

IVAN ZDRAHAL
LICENSE NO. 55,307

IVAN ZDRAHAL ASSOCIATES, PLLC
ENGINEERING AND PLANNING
959 ROUTE 146
CLIFTON PARK, NEW YORK 12065
PHONE : (518)383-0769 FAX : (518)371-4356
email : Zdrahal@aol.com

STUDY MAP
PROPOSED CLOUDSPLITTER LODGE
TOP OF LITTLE WHITEFACE
PREPARED FOR
OLYMPIC REGIONAL DEVELOPMENT AUTHORITY

TOWN OF WILLMINGTON — ESSEX COUNTY, NEW YORK

DATE: SEPTEMBER 1999 | SCALE: 1" = 200' | SHEET 1 OF 1 | MAP NUMBER: 99-62-L

S-1

APPENDIX D

CONSTRUCTION MANAGEMENT COMPANY EVALUATION

mlb

General Contractors and
Construction Managers

January 27, 2000

Mr. Ivan Zdrahal
Zdrahal Associates
959 Route 146
Clifton Park, New York 12065

Dear Ivan,

We at MLB Industries, Inc. appreciate very much the opportunity to review and discuss with you the conceptual plans for the Little Whiteface Mountain Summit Restaurant and Day Lodge, and are pleased to offer the following observations, comments and opinions regarding its construction.

Building this mountaintop facility will obviously require a thoughtful and aggressive approach to climate and accessibility factors. Seasonal weather conditions and mountain operations will clearly drive the schedule, and it will be imperative that project team members work in perfect unison if construction is to be completed in a single window of opportunity. Pre-planning, pre-purchasing and perhaps pre-fabrication of certain components will be critical to success. Accordingly, this particular project is probably best served by the Construction Management delivery system.

With respect to structure and materials, schedule, and budget, we submit to you these thoughts.

STRUCTURE & MATERIALS

In consideration of location, exposure to the elements, usage, durability and maintenance factors, it is our opinion that the structure should consist of cast-in-place footings and foundations with a steel structure and appropriate wood finishes for aesthetic purposes with extensive use of triple pane, low-e glass to facilitate optimal views.

MLB Industries, Inc.
3 Northway Lane
Latham, NY 12110
(518) 785-1371
Fax (518) 785-3865

MLB Industries, Inc.
at North Hills
Raleigh, NC 27619
(919) 786-0031
Fax (919) 571-1377

email: mlbind@global2000.net

The possibility of improving the existing haul road should be considered in determining the main structure and mechanical components. The significant cost of hauling via helicopter could be applied to a usable road for construction and future maintenance use.

Use of pre-cast structural or architectural units could save considerable time and expense associated with the on-site placing of concrete, and should be investigated thoroughly. This same technique could also apply to the underground water storage tank. The roofing system used will need to be carefully studied as well to minimize potential expansion and contraction related problems that could be caused by the extreme temperature differentials. We would envision considerable use of stone on the exterior to maintain architectural integrity with existing structures on "big" Whiteface.

SCHEDULE

Based on the assumption that construction cannot start until the conclusion of the ski season, early to mid April, and that ORDA will want the facility to be in full operation by the following Christmas holiday period, the construction phase will necessarily be limited to eight (8) months. Since design is not yet underway, construction during 2000 would seem unlikely and completion by December 2001 would appear to be the prudent objective. With that in mind, we would propose that preliminary engineering and design move forward promptly so that rock excavation and other site and infrastructure work (i.e. water reservoir and septic system) can be accomplished during the spring/summer/fall of 2000. Meanwhile design development and completion of construction documents can progress through the summer and fall to facilitate October or November 2000 bidding with subsequent pre-purchasing and perhaps some pre-fabrication in preparation for a hit-the-ground-running start in Spring 2001. Such a scenario would seem the most realistic to allow for thoughtful planning and design, resolutions of important water and sewer issues, and thorough preparation for a timely and orderly construction process.

MLB INDUSTRIES, INC.
FIRM PROFILE

Mission Statement: "MLB Industries, Inc. is committed to providing our clients with financially responsible leadership to build their projects and to supply our people with the resources necessary to accomplish this objective".

Shortly after World War II, **John McManus** and **Frederick Longe** convinced Union College classmate **Donald Brockwehl** to relocate from New York City and form **McManus, Longe & Brockwehl** in 1947. By the 1970s, and after 25 years in business, their company had a portfolio of impressive projects throughout the Capital District and New York State. In 1995, MLB opened a second office in Raleigh, North Carolina and has been executing significant projects in the Raleigh-Durham and Richmond, Virginia markets as well.

Now, after more than fifty years in the construction business, **MLB** has delivered major projects for a number of Fortune 500 companies from New York, Massachusetts, Vermont, and as far south as Florida. Some of these successful projects include: the **Fleet/Norstar Bank headquarters**, (the revitalized and award-winning **Union Station** project), the state-of-the-art **GE Plastics Technology Center** in Pittsfield, Mass., and the **Pepsi Arena** in downtown Albany. In addition, MLB has become well known for its work on public and private colleges including **Skidmore College, Rensselaer Polytechnic Institute, Hamilton College, SUNY Albany, Adirondack Community College, Williams College and The University Heights Association.**

MLB Industries, Inc. is now in its **second generation of leadership**. Its principal team of executives are: **Thomas M. Eckert**, President and **Bryan F. Fox**, Executive Vice President of Estimating. Mr. Eckert, who joined MLB in 1979, possesses a strong background in both construction engineering and business management. Mr. Fox, a professional engineer, joined the team in 1984 and has over 25 years of estimating experience.

MLB operates in various capacities: as a **General Contractor**, a **Construction Manager**, and as a **Design/Build Contractor**. Our client base includes corporate, industrial, institutional, retail and healthcare markets. MLB is committed, from top management down, to serve the client well. The optimum project partnership brings all the essential parties together as early as possible, preferably during the design phase. This allows the client the greatest benefit from the entire construction team.

The primary benchmark of MLB service is customer satisfaction. This is evidenced by the number of referrals and requests from previous clients impressed by the quality of MLB's work and our attention to budgets and scheduling. Our talents in team development, mechanical/electrical coordination and project delivery allow us to say: **"No one can build better - faster than MLB".**

mlb

THOMAS M. ECKERT, P.E
Principal and President/CEO

EXPERIENCE:

1979 - Present **MLB Industries, Inc.**
3 Northway Lane
Latham, New York

January 1987 - Present President/CEO

Oversees all field/office operations, working with the Executive Vice President in resolving problems and maintaining client ties. Monitors the activities of outside consultants and develops budgets and plans for future operations. Final negotiations with owners concerning contract awards and close outs are performed by the President.

Other positions held:
Vice President of Operations 1983 - 1986
Manager - Industrial Division 1981 - 1983
Project Manager 1979 - 1981

1978 - 1979
Sweet Associates, Inc.
Construction Coordinator

1976 - 1978
Assistant Professor - Civil Technology
Rochester Institute of Technology
Rochester, New York

EDUCATION /TRAINING:

1976 - 1978
Union College
Schenectady, New York
Degree: M.S. Industrial Administration and Management

1968 - 1971
Rutgers University
New Brunswick, New Jersey
Degree: B.S. Civil Engineering

REGISTRATIONS /AFFILIATIONS:

New York State General Building Contractors – Committee Member
Eastern Contractors Association – Board Member
American Arbitration Association – Construction Case Arbitrator
New York State Professional Engineer – License #053744

BRYAN F. FOX, P.E.
Principal and Executive Vice President

EXPERIENCE:

1984 - Present **MLB Industries, Inc.**
3 Northway Lane
Latham, New York

As Executive Vice President, Mr. Fox is responsible for directing estimating functions for the Northeast and Southeast offices of MLB Industries, Inc. He directs a staff that prepares lump sum bids and construction management estimates. Mr. Fox's duties include contact with clients and subcontractors, quantity takeoffs, and bid preparations and closings. Projects under Mr. Fox's direction have ranged up to 35 million dollars and include commercial, institutional, industrial and waste treatment projects in New York, New England, North Carolina, Virginia and Florida.

1973 - 1984
Sweet Associates, Inc.
Schenectady, New York

As manager of Estimating, Mr. Fox's primary responsibilities included preparation of lump sum, negotiated, and Construction Management estimates. He was responsible for project start-up, subcontract negotiations, purchasing and scheduling. Mr. Fox provided engineering overview and support for less technically trained personnel on active projects. He assumed the position of Project Manager for many projects and assisted Project Managers assigned to major fixed price, and Construction Management contracts. Estimating duties also included supervising 2 to 4 staff members and training intern Project Engineers in procedures and methods.

EDUCATION /TRAINING:

1979
Union College
Schenectady, New York
Degree: Bachelor of Science-Civil Engineering

1965
Hudson Valley Community College
Troy, New York
Degree: Associate in Applied Science-Civil Technology

REGISTRATIONS /AFFILIATIONS:

New York State Professional Engineer Lic. # 058677
National Society of Professional Engineers
Corporate Representative - Local Chapter of American Concrete Institute

APPENDIX E

SOIL REPORT

DIVERSIFIED SOIL SERVICES, LTD.

POST OFFICE BOX 489, CLAVERACK, NY 12513

Telephone: 518-851-7953
Fax: 518-851-6300
E-mail: www.cptdirt@valstar

August 2, 1999

TO: IVAN ZDRAHAL
959 ROUTE 146
CLIFTON PARK, NY 12065

RECEIVED
AUG 0 9 1999
IVAN ZDRAHAL ASSOCIATES

RE: DEEP SOIL TEST PITS
LITTLE WHITE FACE MOUNTAIN
WILMINGTON, NY

At your request and in response to a request from the ORDA administrators at the Whiteface Mountain ski facility, I witnessed deep soil test pits in various locations on the slopes of Little Whiteface Mountain. The purpose of the investigation was to find suitable soil that would allow the construction of a septic disposal area for the proposed ski lodge at the peak of Little Whiteface, overlooking Lake Placid.

The soils at Whiteface Mountain are mainly shallow and moderately deep; coarse textured glacial till soils over hard crystalline bedrock. There are inclusions of some deep, bouldery soils with very firm fragipans (hardpan). There are also some narrow well defined drainage corridors coming down off the mountain that have either perennial or intermittent streams.

The shallow soils classify as well drained Lyman soils with inclusions of very shallow organic Ricker soils and similar thin "smears" of folists at high elevations and on steep and very steep slopes. Moderately deep soils are Tunbridge and the deep soils are typically Becket soils

The soil test pits were excavated by backhoe in areas where slopes were not prohibitive, but typically included some areas that were slightly steeper than ideal and in some cases were adjacent to some very steep slopes. Wetlands were avoided.

Test pits were excavated in three locations on the mountainside along the existing ski trails. The first set of test pits were dug near the Excelsior trail. The second set of pits were excavated near the Connector and the remaining test pits examined up on the mountain were near the Easy Street trail. The folist soils at the peak were examined with hand tools.

The following soil conditions were witnessed at the Excelsior test pit:

The surface layer from 0 to 21 inches is brown very gravelly loamy fill.
BC horizon – 21 to 45 inches, olive brown (2.5Y 5/4) very gravelly sand; weak, coarse subangular blocky structure; firm; 40 percent gravel and small boulders.
Cd horizon - 45 to 72 inches, olive (5Y 4/3) very gravelly sand; massive; very firm; 40 percent gravel and small and medium boulders; few, medium and coarse, distinct strong brown (7.5YR 5/6) mottles in the upper part.

There are no seeps or even moist conditions in the soil pit. There is a boundary condition at 45 inches due to the very firm fragipan seasonally perching the water table.

The Adirondack Park Agency HIS symbol for this soil is B2RC/DA

The test pit was at the edge of an active ski trail. It appears the area had been excavated, graded and groomed to create the trail. Most of the surface layer was removed in initial construction and the fill was put in place when the final grade was established. The thickness and composition of the surface fill may vary slightly throughout the immediate location. There was a natural exposure of the soil on the opposite side of the ski trail where the undisturbed soil profile could be observed. It appeared to be a typical soil profile of Becket soils.

The following soil conditions were witnessed at the upper pit at the Connector trail:

The surface layer from 0 to 16inches is brown very gravelly loamy fill.
(buried) Bhs horizon – 16 inches, (discontinuous) dark reddish brown (5YR 3/2) fine sandy loam very gravelly sand; friable.
Bs horizon -- 16 to 38 inches, yellowish brown (10YR 5/6) gravelly loamy sand; weak, medium subangular blocky structure; 20 percent gravel and small boulders; friable.
BC horizon – 38 to 47 inches, light olive brown (2.5Y 5/4) gravelly loamy sand; weak, coarse subangular blocky structure; 30 percent rock fragments and small boulders; slightly firm.
Cd horizon - 47 to 72 inches, olive (5Y 4/3) very gravelly sand; massive; very firm; 45 percent gravel and small and medium boulders;

There are no seeps or even moist conditions in the soil pit. Although there are no mottles it is likely that the very firm fragipan at 47 inches would result in a boundary condition.

The soil series is typical Becket loamy fine sand.
The Adirondack Park Agency HIS symbol for this soil is B2RCA

The test pit is at the edge of an active ski trail. The existing ski trail has been realigned and two levels of the existing trail now exist. There are steep slopes vertically adjacent to the test pits. Horizontally, the slopes are tolerable.

The following soil conditions were witnessed at the lower pit at the Connector trail:

There is a smear of gravelly fill over the surface layer ranging from 0 to 16 inches thick, but generally it is quite thin, but may be more significant in other locations near the pit.

Oi horizon (includes E horizon mixed): 0 to 14 inches, black (10YR 2.5YR 2/1) Fibric material, mostly from decomposed leaves.

Bs horizon -- 14 to 38 inches, yellowish brown (10YR 5/6) gravelly loamy sand; weak, medium subangular blocky structure; 20 percent gravel and small boulders; friable.

BC horizon – 38 to 53 inches, light olive brown (2.5Y 5/4) gravelly loamy sand; weak, coarse subangular blocky structure; slightly firm.

Cd horizon – 53 to 72 inches, olive (5Y 4/3) very gravelly sand; massive; very firm; 40 percent gravel and small and medium boulders.

There are no seeps or even moist conditions in the soil pit. Although there are no mottles it is likely that the very firm fragipan at 53 inches would result in a boundary condition.

The soil series is typical Becket loamy fine sand.
The Adirondack Park Agency HIS symbol for this soil is B2RCA

The test pit was at the edge of an active ski trail. The existing ski trail has been realigned and two levels of the existing trail now exist. There are steep slopes vertically adjacent to the test pits. Horizontally, the slopes are tolerable.

The following soil conditions were witnessed at the upper pit at the Easy Street trail:

Oi horizon (includes E horizon and Bh horizon mixed): 0 to 14 inches, black (10YR 2.5YR 2/1)Fibric material, mostly from decomposed leaves mixed with some mineral layers.

Bs horizon -- 14 to 31 inches, yellowish brown (10YR 5/6) gravelly loamy sand; weak, medium subangular blocky structure; 20 percent gravel and small boulders; friable.

BC horizon – 31 to 53 inches, light olive brown (2.5Y 5/4) gravelly loamy sand; many, medium and coarse, distinct reddish yellow (7.5YR 6/6) mottles; weak, coarse subangular blocky structure; slightly firm.

Cd horizon – 53 to 72 inches, olive (5Y 4/3) very gravelly sand; massive; very firm; 40 percent gravel and small and medium boulders.

There are no seeps or even moist conditions in the soil pit. The boundary condition is at 31 inches, mottles from perched, seasonal high water table.

The soil series is Udorthents/Becket loamy fine sand.
The Adirondack Park Agency HIS symbol for this soil is B2RCA

The test pit is within an active ski trail.

The following soil conditions were witnessed at the gravel pit near the base lodge. The gravel has been mined, obviously for a long time and some rock ledge has been exposed in the steep side slopes of the pit. The test pits are in the bottom of the excavated pit.

Surface layer 0 to 72 inches, alternating layers of very gravelly (skeletal) sand and fine gravel.

There are no seeps or even moist conditions in the soil pit. The undisturbed soil is Hinckley loamy sand, very gravelly. The existing condition is Udorthent, sandy, excavated, smoothed.

The second test pit in the gravel pit is similar to the first except that the soil becomes moist at refusal at 66 inches. There may be ledge at just below the bottom of the pit.

The Adirondack Park Agency HIS symbol for this soil is A1NBA.

Either slope or boundary condition, typically impervious layer, limited all of the test pits observed on the mountainside. The soil conditions in the test pits in the gravel pit at the base of the mountain were unrestricted, but there are engineering, design and logistic issues involved in transporting effluent from the lodge at the top of Little Whiteface to the disposal area more than a mile away at the base of the mountain.

Roger J. Case, CPSC, CPSS (ARCPACS)
Professional Soil Scientist, ESP-NY, SSSSNE
President, DSS, Ltd.

LOCATION BECKET NH+MA ME NY VT

Established Series
Rev. HRM-RJK-SHG
06/1999

BECKET SERIES

The Becket series consists of very deep, well drained soils that formed in a loamy mantle overlying dense, sandy till on drumlins and glaciated uplands. They are moderately deep to a densic contact. Permeability is moderate in the solum and moderately slow to slow in the dense substratum. Slope ranges from 3 to 60 percent. Mean annual precipitation is about 40 inches and mean annual temperature is about 43 degrees F.

TAXONOMIC CLASS: Coarse-loamy, isotic, frigid Oxyaquic Haplorthods

TYPICAL PEDON: Becket fine sandy loam, on a 9 percent west-southwest facing slope in a stony, forested site. (Colors are for moist soil.)

Oi--0 to 2 inches; fibric material comprised of partially decomposed leaves and pine needles. (0 to 4 inches thick)

E--2 to 4 inches; pinkish gray (7.5YR 6/2) fine sandy loam; weak fine granular structure; very friable; many medium and fine roots; 5 percent gravel; very strongly acid; abrupt wavy boundary. (0 to 3 inches thick)

Bhs--4 to 5 inches; dark reddish brown (5YR 3/2) fine sandy loam; weak fine granular structure; very friable; many medium and fine roots; 10 percent gravel; very strongly acid; abrupt wavy boundary. (0 to 5 inches thick)

Bs1--5 to 7 inches; reddish brown (5YR 4/4) fine sandy loam; weak fine granular structure; very friable; many medium and fine roots; 10 percent gravel; very strongly acid; abrupt irregular boundary.

Bs2--7 to 14 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine granular structure; very friable; common medium and fine roots; 10 percent gravel; very strongly acid; clear irregular boundary.

Bs3--14 to 24 inches; yellowish brown (10YR 5/6) gravelly sandy loam; weak medium granular structure; friable; common fine roots; 15 percent gravel; very strongly acid; clear wavy boundary. (Combined thickness of the Bs horizon is 3 to 25 inches)

BC--24 to 33 inches; light olive brown (2.5Y 5/4) gravelly sandy loam; moderate medium granular structure; friable; few fine roots; 20 percent gravel, 5 percent cobbles; strongly acid; abrupt smooth boundary. (0 to 17 inches thick)

Cd--33 to 67 inches; mixed olive (5Y 4/3) gravelly sandy loam and olive yellow (2.5Y 6/6) sand, composite texture of gravelly loamy sand; massive; firm and brittle; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation; 20 percent gravel, 10 percent cobbles; horizon consists of firm gravelly sandy loam with horizontally oriented lenses and pockets of loose sand; rock fragments coated with olive yellow (2.5Y 6/6) sand; strongly acid.

LOCATION HINCKLEY MA+CT NH NY RI VT

Established Series
Rev. WHT-CAW-SMF
10/97

HINCKLEY SERIES

The Hinckley series consists of very deep, excessively drained soils formed in water-sorted material. They are nearly level to very steep soils on terraces, outwash plains, deltas, kames, and eskers. Permeability is rapid in the solum and very rapid in the substratum. Slope ranges from 0 to 60 percent. Mean annual precipitation is about 45 inches and the mean annual temperature is about 50 degrees F..

TAXONOMIC CLASS: Sandy-skeletal, mixed, mesic Typic Udorthents

TYPICAL PEDON: Hinckley loamy sand - Red pine plantation, in an old abandoned field. (All colors are for moist soil.)

Oe--0 inch to 1; hemic material formed from moderately decomposed red pine needles and twigs.

Ap--1 to 8 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine and medium granular structure; very friable; many fine and medium roots; 5 percent fine gravel; very strongly acid; abrupt smooth boundary. (5 to 10 inches thick)

Bw1--8 to 11 inches; strong brown (7.5YR 5/6) gravelly loamy sand; weak fine and medium granular structure; very friable; common fine and medium roots; 20 percent gravel; very strongly acid; clear smooth boundary.

Bw2--11 to 16 inches; yellowish brown (10YR 5/4) gravelly loamy sand; weak fine and medium granular structure; very friable; common fine and medium roots; 25 percent gravel; very strongly acid; clear irregular boundary. (Combined thickness of the Bw horizon is 3 to 16 inches.)

2BC--16 to 19 inches; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose; common fine and medium roots; 40 percent gravel; strongly acid; clear smooth boundary. (0 to 5 inches thick)

2C--19 to 65 inches; light olive brown (2.5Y 5/4) extremely gravelly sand consisting of stratified sand, gravel and cobbles; single grain; loose; common fine and medium roots in the upper 8 inches and very few below; 60 percent gravel and cobbles; moderately acid.

TYPE LOCATION: Worcester County, Massachusetts; Town of Petersham, Harvard Forest, 0.4 miles east of the western edge of Harvard ("Brooks") Pond and 0.75 miles north of Route 122. Lat. 42 degrees 30 minutes 14 seconds N., and 72 degrees 12 minutes 04 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 12 to 30 inches. Rock fragment content of the solum ranges from 5 to 50 percent gravel, 0 to 15 percent cobbles, and 0 to 3 percent stones. Rock fragment content of individual horizons of the substratum ranges from 10 to 50 percent gravel, 5 to 25 percent cobbles, and 0 to 5 percent stones. The soil ranges from extremely acid through moderately acid except where limed.

LOCATION LYMAN MA+ME NH NY VT

Established Series
Rev. DGG-WHT-CAW
6/98

LYMAN SERIES

The Lyman series consists of shallow, somewhat excessively drained soils formed in glacial till. They are on rocky hills and high plateaus. Permeability is moderately rapid. Slope ranges from 3 to 80 percent. Depth to bedrock ranges from 10 to 20 inches. Mean annual precipitation is about 40 inches and mean annual temperature is about 43 degrees F.

TAXONOMIC CLASS: Loamy, isotic, frigid Lithic Haplorthods

TYPICAL PEDON: Lyman loam, in a very rocky, forested area. (Colors are for moist soil.)

Oe--0 to 1 inches; hemic material. (0 to 3 inches thick)

A--1 to 3 inches; black (N 2/0) loam; weak fine granular structure; very friable; many fine and medium roots; extremely acid; abrupt wavy boundary. (0 to 4 inches thick)

E--3 to 5 inches; reddish gray (5YR 5/2) fine sandy loam; very weak fine granular structure; very friable; many fine and medium roots; 10 percent gravel; extremely acid; abrupt broken boundary. (0 to 10 inches thick)

Bhs--5 to 7 inches; very dusky red (2.5YR 2/2) loam; very weak fine granular structure; friable; many fine and medium roots; 10 percent fine gravel; extremely acid; abrupt broken boundary. (0 to 4 inches thick)

Bs1--7 to 11 inches; dark red (2.5YR 3/6) loam; weak fine and medium granular structure; friable; many fine and medium roots; 10 percent fine gravel; few mica flakes; very strongly acid; clear wavy boundary.

Bs2--11 to 18 inches; dark brown (7.5YR 4/4) grading with depth to brown (10YR 5/3) channery loam; weak coarse subangular blocky structure parting to medium and fine granular; friable; many fine and medium roots; 15 percent channers of schist and quartzite; common flakes of mica; very strongly acid; abrupt smooth boundary. (Combined thickness of the Bs horizon is 5 to 17 inches.)

R--18 inches; dark gray mica schist bedrock.

TYPE LOCATION: Franklin County, Massachusetts; Town of Monroe, about 1/2 mile west of the village of Monroe Bridge and about 25 feet south of River Road; lat. 42 degrees 43 minutes 15 seconds N. and long. 72 degrees 57 minutes 05 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 10 to 20 inches and corresponds to the depth to bedrock. Rock fragments are schist with lesser amounts of phyllite, granite, and gneiss. Fragments smaller than 3 inches range from 5 to 25 percent throughout the soil. Fragments 3 to 10 inches in size range from 0 to 10 percent throughout. Fragments larger than 10 inches range from 0 to 15 percent in the A and from 0 to 3 percent in the B horizon. The soil ranges from extremely acid to moderately acid

LOCATION RICKER VT+ME NH NY

Established Series
Rev. DLY-SHG-CAW
1/99

RICKER SERIES

The Ricker series consists of very shallow and shallow, well drained to excessively drained organic soils on mountains and hills. They formed in thin organic deposits underlain in most places by a very thin mineral horizon over bedrock. Permeability is moderately rapid in the organic layers and moderate or moderately rapid in the mineral horizon. Slope ranges from 3 to 80 percent. Mean annual precipitation is about 50 inches and mean annual temperature is about 40 degrees F.

TAXONOMIC CLASS: Dysic Lithic Cryofolists

TYPICAL PEDON: Ricker peat, 15 to 80 percent slopes, in a very rocky wooded area. (Colors are for moist soil unless otherwise noted.)

Oi--0 to 2 inches; dark reddish brown (2.5YR 2/4) broken face peat (fibric material), dark reddish brown (5YR 2/2) crushed and rubbed; about 90 percent fiber, 75 percent rubbed; massive; loose; many roots; 5 percent twigs; extremely acid; clear wavy boundary. (1 to 6 inches thick)

Oe--2 to 4 inches; black (N2/0) broken, crushed and rubbed mucky peat (hemic material); about 60 percent fiber, 20 percent rubbed; weak thin platy structure; friable; many roots; extremely acid; clear wavy boundary. (0 to 10 inches thick)

Oa--4 to 7 inches; black (N2/0) broken, crushed and rubbed muck (sapric material); about 30 percent fiber, 15 percent rubbed; massive; friable; common roots; extremely acid; abrupt wavy boundary. (0 to 10 inches thick)

E--7 to 9 inches; dark bluish gray (5B 4/1) very channery silt loam; massive; friable; common roots; 50 percent schist fragments; extremely acid; abrupt irregular boundary. (0 to 4 inches thick)

R--9 inches; micaceous schist.

TYPE LOCATION: Lamoille County, Vermont; Town of Stowe, Mt. Mansfield, 100 yards down Butler Lodge Trail from TV access road; 30 feet to the south. Latitude 44 degrees, 31 minutes, 33 seconds N., Longitude 72 degrees, 49 minutes, 00 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: The depth to bedrock ranges from 1 to 20 inches. Very thin mineral layers are at the bedrock interface in most pedons. Rock fragments range from 0 to 50 percent in the mineral layers. The organic material is extremely acid and the mineral layers are extremely or very strongly acid.

The Oi horizon is neutral or has hue of 2.5YR to 10YR, value of 2 to 4, and chroma of 0 to 4. It is slightly decomposed leaves, needles, twigs, and moss (fibric material).

LOCATION TUNBRIDGE VT+MA ME NH NY

Established Series
Rev. RLM-GWS-SHG
7/98

TUNBRIDGE SERIES

The Tunbridge series consists of moderately deep, well drained soils on glaciated uplands. They formed in loamy glacial till. Permeability is moderate or moderately rapid. Slope ranges from 0 to 75 percent. Mean annual precipitation is about 40 inches, and mean annual temperature is about 44 degrees F.

TAXONOMIC CLASS: Coarse-loamy, isotic, frigid Typic Haplorthods

TYPICAL PEDON: Tunbridge fine sandy loam, on a south-facing slope of 4 percent, in a rocky wooded area. (Colors are for moist soil.)

A--0 to 2 inches; dark brown (7.5YR 3/2) fine sandy loam; weak fine granular structure; very friable; many roots; 5 percent rock fragments; extremely acid; abrupt wavy boundary. (0 to 6 inches thick)

E--2 to 3 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure, friable; many roots; 5 percent rock fragments; very strongly acid; abrupt broken boundary. (0 to 4 inches thick)

Bh--3 to 9 inches; dark reddish brown (5YR 3/4) loam; moderate medium angular blocky structure; friable; many roots; 10 percent rock fragments; very strongly acid; clear wavy boundary. (0 to 4 inches thick)

Bs--9 to 14 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; many roots; 10 percent rock fragments; very strongly acid; clear wavy boundary. (0 to 16 inches thick.)

C--14 to 28 inches; dark grayish brown (2.5Y 4/2) gravelly fine sandy loam; massive; friable; common roots; 15 percent rock fragments; moderately acid; abrupt irregular boundary. (0 to 16 inches thick)

R--28 inches; mica schist and gneiss bedrock.

TYPE LOCATION: Lamoille County, Vermont; Town of Stowe; 0.25 mile east of Town Road #23 and 2.50 miles north of junction of Town Road #23 and Vermont Route 108; approximate latitude 44 degrees, 31 minutes, 00 seconds N., longitude 72 degrees, 42 minutes, 00 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: The thickness of the solum ranges from 14 to 38 inches. The depth to bedrock ranges from 20 to 40 inches. Reaction ranges from extremely acid through moderately acid in the solum and from strongly acid through slightly acid in the substratum. Rock fragments are mostly gravel, channers, and cobbles and range from 5 to 35 percent throughout the soil. The thickness of spodic horizon (Bh, Bs, and Bhs horizon, where present) ranges from 4 to 16 inches and is weakly smeary or not smeary. The silt content in the solum and substratum is typically less than 50 percent. The fine-earth is typically fine sandy loam, sandy loam, very fine sandy loam or loam, but horizons of silt loam are allowed. Stony and bouldery phases of the Tunbridge series are recognized.

APPENDIX F

PROPOSAL FOR DEVELOPMENT OF GROUNDWATER SOURCE OF POTABLE WATER

Jacques Whitford Company, Inc.

Consulting Engineers
Environmental Scientists
Information Consultants

RR1 Box 36
Pike Hill Road
West Topsham, VT
U.S.A. 05086

Tel: 802 439 5220
Fax: 802 439 6282

E-mail: info@jacqueswhitford.com
Web Site: www.jacqueswhitford.com

Geotechnical Engineering
Site Investigations
Blasting Control
Earthworks
Foundations
Rock Mechanics

Materials Engineering & Research
Mining Engineering
Environmental Sciences
Environmental Engineering
Air Quality
Hydrogeology

Dartmouth, NS
Sydney, NS
Port Hawkesbury, NS
Saint John, NB
Fredericton, NB
Moncton, NB
Bathurst, NB
Charlottetown, PE
St. John's, NF
Corner Brook, NF
Goose Bay, LAB
Hull, PQ
Ottawa, ON
Toronto, ON
Regina, SK
Calgary, AB
Lethbridge, AB
Vancouver, BC
Freeport, ME
Winslow, ME
Portsmouth, NH
Port of Spain, Trinidad
Mexico, DF
Moscow, Russia
Buenos Aires, Argentina

August 16, 1999

RECEIVED
AUG 23 1999
IVAN ZDRAHAL ASSOCIATES

Mr. Ivan Zdrahal, P.E.
Ivan Zdrahal Associates
959 Route 146
Clifton Park, New York 12065

Re: Proposed Day Lodge at Whiteface Mountain
Groundwater Source

Dear Mr. Zdrahal:

This is a proposal to assist you with development of a potable groundwater source to serve the proposed day lodge at the top of Little Whiteface. My involvement will be to locate one or more favorable well sites, and then, if desired by you, to assist with well construction, pump testing, hydraulic analysis, and report preparation that may be needed to gain regulatory approval of the new water source.

SCOPE OF SERVICES

1. Identification of Favorable Well Sites

The key to finding water at the top of Little Whiteface is interpretation of aerial photographs for identification of water-bearing fracture zones in the bedrock (ledge). I will purchase copies of available stereo aerial photographs, enlarge one or more of these as necessary, and study them in plan and stereo view to map so called "fracture traces" that are indicative of underlying cracks and crevices in the bedrock. Additionally, I will consider available geologic and topographic maps of the area.

Once apparently favorable well sites are mapped, I will come to the mountain top in the company of you or others to verify the photo-interpretations and to consider the practical aspects of the identified favorable well sites. Practical aspects include drilling rig access, contaminant sources, availability of electrical power, and transmission pipeline distance.

Following the on-site inspection, I will make my recommendations in a report that will document my findings and conclusions. Selected well sites will be prioritized where possible, and will be located on a topographic map of the area, as well as on copies of the aerial photographs.

2. Well Construction and Pump Testing

It is most helpful if I can be present during the drilling to evaluate the geologic nature of the fractures encountered at depth. This permits me to determine how deep the well should be drilled, and if necessary, where a subsequent well should be drilled. If you desire this service, I will mobilize to the selected well site with the drilling contractor and overseen his work. I will maintain a geologic log of the well including fracture depths and yields. Based on my observations, I will determine well depth and subsequent well location as necessary to locate the desired supply of potable groundwater.

If pump testing is needed to determine the hydraulic characteristics of the well, or to gain approval of the water source, I will work with the drilling contractor to complete a step-drawdown pumping test followed by a 3-day constant rate pumping test. Water samples will be collected for laboratory analysis of all required parameters. I will analyze the pumping test and water quality data and prepare a report that meets the engineering and regulatory requirements.

COSTS

The work required to complete task 1, as described above, is well enough defined at this point for me to give a lump sum charge of $3,500. The remaining work will be completed on a time & materials basis using our standard rates. My estimated charge for the well construction, pump testing, and hydraulic analysis tasks are as follows:

-Oversee well construction (assume two wells drilled in one week)	$6,800
-Assist with pumping test	$2,300
-Analysis and report	$2,400

An alternative approach is for me to do just a "desk top" job with you furnishing the necessary topographic maps and aerial photographs, and you doing the on-site inspection work yourself. I will do this limited scope for a lump sum of $1,200.

QUALIFICATIONS

I have completed numerous groundwater supply development projects over the last 25 years. This experience has given me a good degree of expertise in locating high-yielding wells in the crystalline rocks that underlie much of the Northeast and most definitely Whiteface Mountain. I also have years of experience in the location of high-capacity wells in glacial sand & gravel deposits.

Attached you will find a list of projects, almost all of which were completed by me, and a list of project references, including several from New York State who you may wish to contact. I am currently working in Wilmington, NY to locate a new municipal supply. We are about to initiate test drilling at a gravel aquifer location. In Keeseville, I

just completed the 6-inch diameter test drilling phase of an effort to locate a new municipal well to replace or supplement their current reservoir source. The effort was successful with the location of a 6-inch test well yielding 200 gpm. Also in Black Brook we are about to construct a second production well in a deep gravel deposit where a 6-inch diameter screen well I located yields more than 100 gpm.

Specifically for work at ski areas, I have located the high-capacity pubic water supply wells up on the mountain at Sugarloaf USA, and several condominium wells at Sunday River, both of which are in northwest Maine. Closer to you, I located the new municipal wells that will serve Lyon Mountain up on the side of Lyon Mountain itself. All of these mountain wells are drilled into fractured crystalline bedrock.

Thank you for requesting this proposal. Please call me with any questions you or others may have.

Sincerely yours,
Jacques Whitford Company, Inc.

Brad Caswell

Brad Caswell, Ph.D.
Senior Scientist

AMERICAN INSTITUTE OF HYDROLOGY
Certificate Number
195
W. Bradford
Caswell
Professional Hydrogeologist

APPENDIX G

PRODUCT INFORMATION

1. Water Filtration Equipment
2. Grinder Pump
3. Effluent Filters by "Zabel"
4. Effluent Piping by "Poly-Therm"
5. Composting Toilets by "Clivus"

1. WATER FILTRATION EQUIPMENT

Fax - 518. 371. 4356

From: chuck kolstad <kolstad@frontiernet.net>
To: rochester@powers.com <rochester@powers.com>
Cc: kolstad2@frontiernet.net <kolstad2@frontiernet.net>
Date: Sunday, November 28, 1999 4:10 PM
Subject: White Face Mountain Gondola Station

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28 Nov '99
Ivan ,

For surface water (or, under the influence of...), I would recommend that a two train, each 100% (at 20 gpm process flow rate) filtration system; process train to consist of:

Twin 30" diameter multi layer, backwashable pressure filters
series installed, twin 24" diameter, pressure, backwashable, diatomite (DE) filters
then, series installed, twin cartridge type barrier filters.
Budget for the preceding equipment, no installation is ~$35,000.00

The above system to supply a finished water storage tank with chlorination and retention provisions. The potable water pumping system to be capable of backwashing the multi layer filters and supplying the facility. In addition to finished water storage, you may want a storage for the filter waste water as well.

If you are able to locate a good source of ground water, it may only require iron and manganese removal; budget ~ $15,000.00 for the manganese greensand filtration; you'll still require the finished water storage and backwash systems.

Ivan, let me know if you would like more information.

Chuck Kolstad

SEPARMATIC FILTER COMPANY
DIVISION OF SEC CORPORATION
7628 WEST FLORIST AVENUE
MILWAUKEE, WISCONSIN 53218-1796
(414) 466-5200
FAX 414-466-5258

FILTRATION THEORY

The diatomite filter depends on a mechanically formed mat of interlaced diatomaceous earth particles. This mat is supported on filter elements constructed of interlocking high impact thermoplastic discs covered with a fine mesh fabric screen with stainless steel end pieces.

Water velocity and the tendency of diatomite particles to interlace, hold the mat on the filter elements. Design and construction of the diatomite filter require continuous flow through the filter once the mat of diatomaceous earth has been applied to elements. If this is not done, the mat (or cake) will not adhere to the elements and they will be left unprotected. Suspended solids (hereafter referred to as turbidity) will then either pass through or be deposited on elements. Eventually elements will become clogged due to build-up of turbidity within the element openings and will require cleaning.

An initial filtering mat of diatomaceous earth, known as precoat, is placed on the elements at the start of a filter run. A predetermined amount of diatomaceous earth is placed in the open water filled precoat tank with mixer and the solution is allowed to mix well. The precoat pump is started, the precoat valve opened, and the mixture is pumped into the bottom of the filter vessel. When the filter tank is full, water will flow back into the precoat tank.

The water is then recirculated through the filter and precoat tank until the diatomite is caught on the surface of the elements and builds up an initial porous mat of interlaced diatomite particles presenting a surface composed of a great number of microscopic openings.

At the beginning of a filter run, the precoat surface is porous. However, if turbid water is passed through continuously, turbidity will accumulate on the precoat outer surface forming a impervious surface, gradually stopping the flow of water. The rate at which pores will clog depends upon the amount and type of turbidity in the water being filtered and the filtration rate. In most cases, pores will clog in a short time.

To keep the coat porous and permit much longer filter runs at equal flow rates, additional diatomite is introduced into the water continuously throughout the run. This continuous feed of filter-aid slurry is known as body feed.

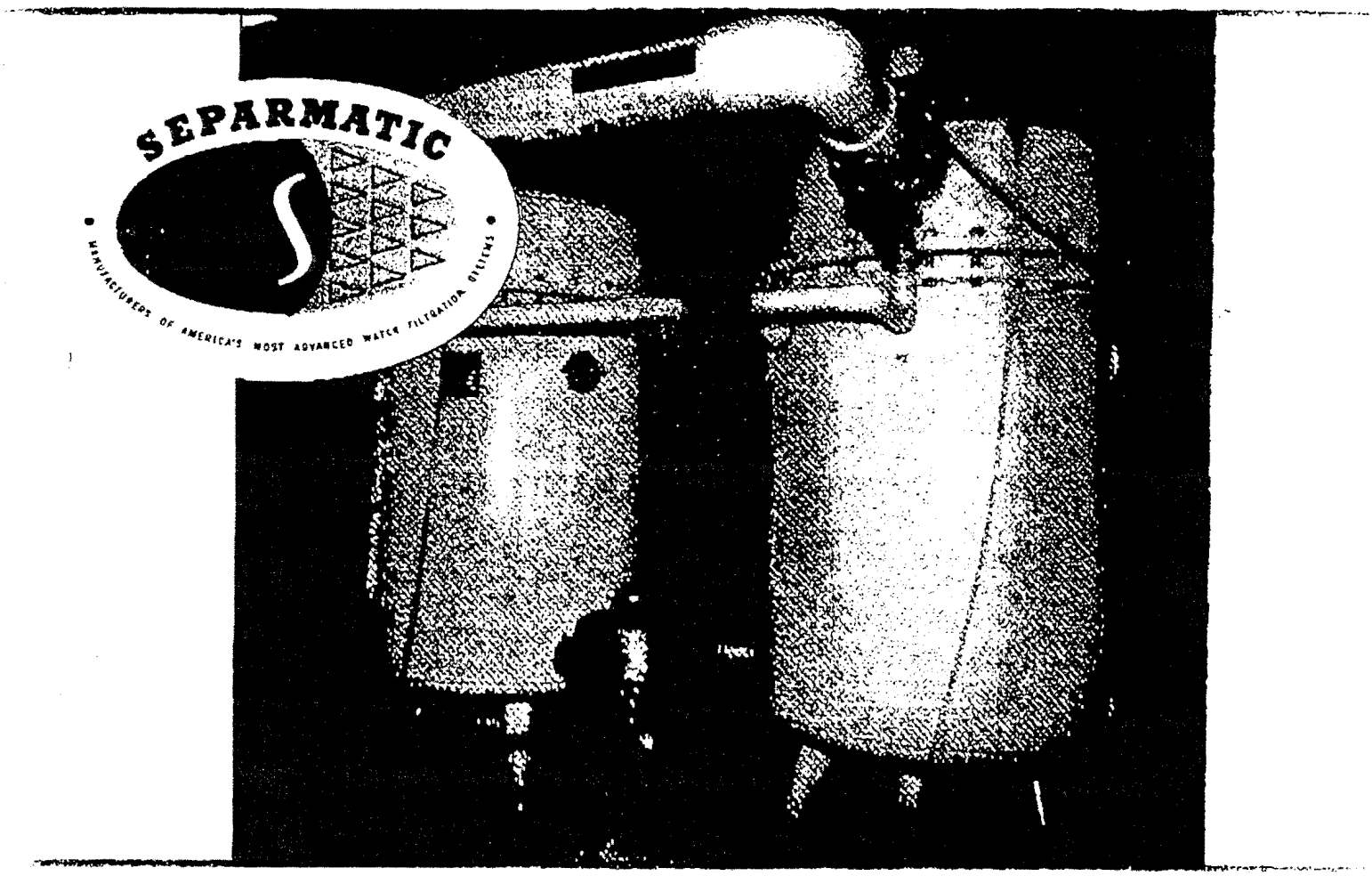
As water flows through the filter, it encounters resistance in passing through the many small openings between diatomaceous earth particles. As filter cake increases in thickness during the filter run, this resistance (known as pressure loss) also increases.

Pressure differential, measured in pounds per square inch, is read directly from the two pressure gauges on the influent and effluent of the filter. Depending upon the particular system, this pressure loss should not be allowed to exceed approximately 25 PSI. When this pressure differential is reached, it is time to clean the filter.

SEPARMATIC

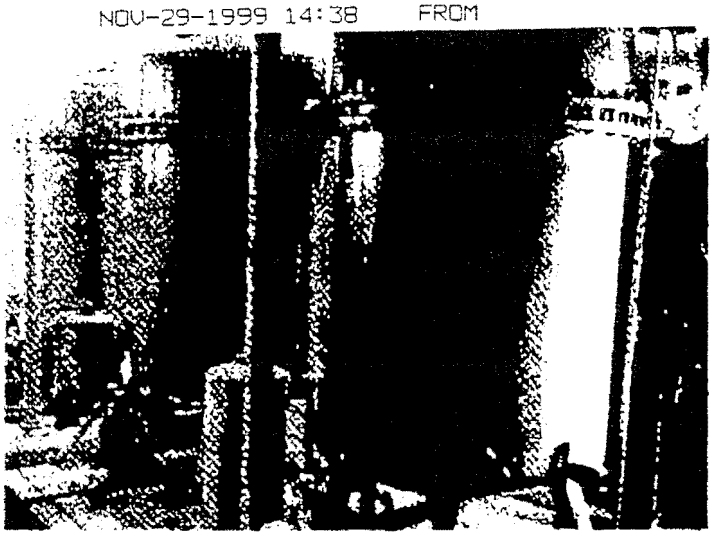
DIATOMITE PRESSURE

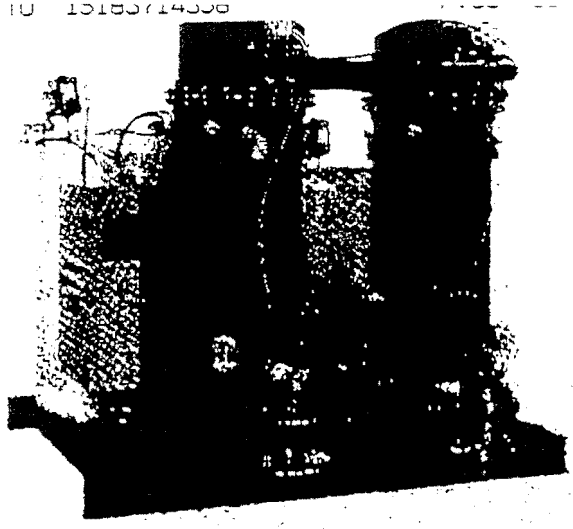
WATER FILTERS



APPLICATIONS

- SWIMMING POOLS . . . for Top Efficiency
- PROCESS WATER . . . for High Polish Water
- CONDENSATE . . . for removal of Oil and Suspended Metal Oxides
- OIL FIELD FLOODING . . . for High Clarity Injection Water
- COOLING TOWERS . . . to Remove Suspended Solids
- POTABLE WATER . . . for Consistent Quality



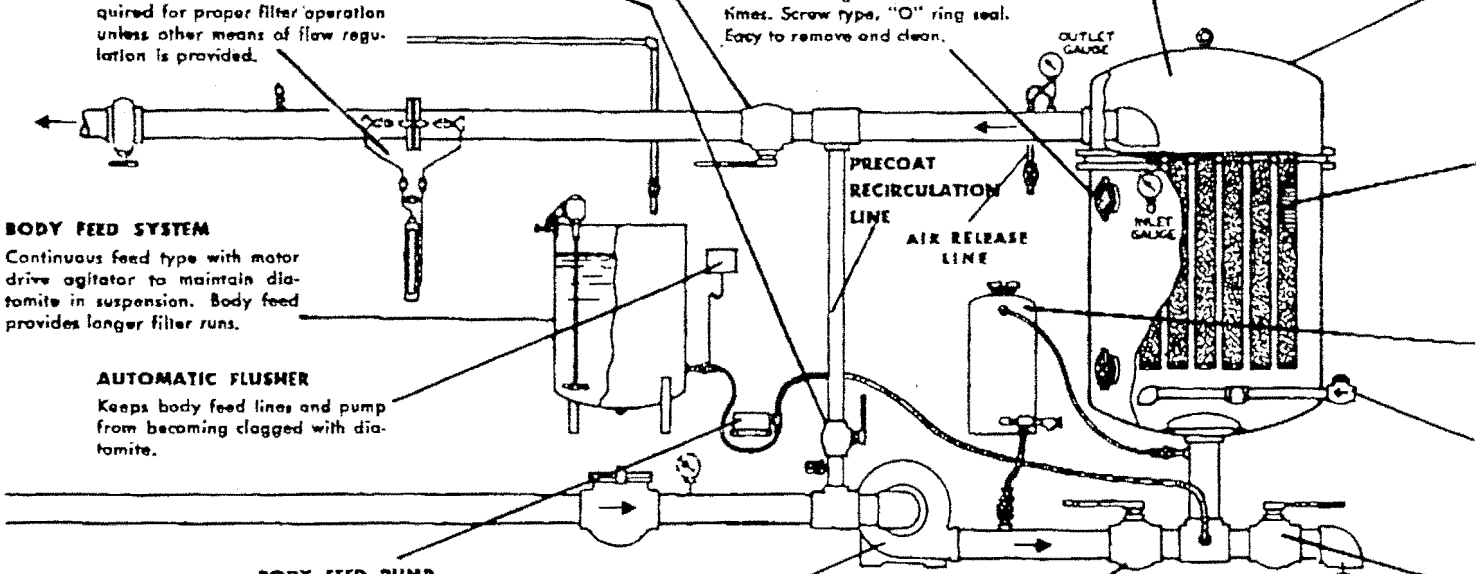


TYPICAL FILTER INSTALLATIONS

Serving faithfully wherever top quality filtered water is needed.

For attention-free operation, any system may be automated with special automatic controls

OPERATING FEATURES AND "HOW IT WORKS"



PRECOAT VALVE
Single lever valve open only during the precoat recirculation period.

FILTER OUTLET VALVE
Single lever valve normally used to regulate flow through filter. Fully closed during precoating, "air-bump", backwashing and cleaning the filter.

AIR DOME
Air, trapped here under pressure, supplies the energy for a vigorous "Air-bump" backwash that ejects the filter cake from the septum. A very high reverse flow is obtained that is many times more effective than an ordinary water backwash.

FLOW METER
For an accurate visual measurement of the filtration rate. Required for proper filter operation unless other means of flow regulation is provided.

INSPECTION PORT
Permits seeing into filter at all times. Screw type, "O" ring seal. Easy to remove and clean.

BODY FEED SYSTEM
Continuous feed type with motor drive agitator to maintain diatomite in suspension. Body feed provides longer filter runs.

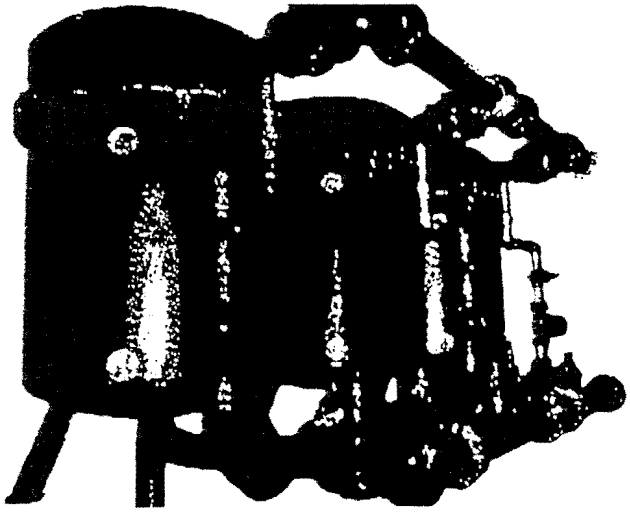
AUTOMATIC FLUSHER
Keeps body feed lines and pump from becoming clogged with diatomite.

BODY FEED PUMP
115 v., 60 cycle positive displacement type with adjustable feed.

HOLDING PUMP (not shown)
On filter installations where the raw water is entering the system under pressure greater than 40 p.s.i., the filter pump may not be necessary. For this type of installation a holding pump is installed in the pre-coat recirculation line to assist in pre-coating and in maintaining flow through the filter at all times. The latter is necessary to hold the filter cake intact on the septum when there is no flow demand.

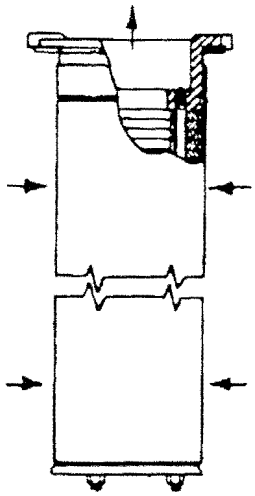
FILTER PUMP
Centrifugal pump sized for 60 foot minimum total head at filter design flow and 90 foot minimum head at shut-off.

FILTER INLET VALVE
A single lever valve, wide open during filtering, closed during backwashing. With a pressure type precoat tank this valve is partially closed for a few minutes to force water through the precoat tank and then into the filter.



Multiple units may be combined to provide flexibility for any requirement.

DURABLE PLASTIC TUBULAR ELEMENTS (SEPTUM)



LIFETIME PLASTIC DISC CORE — Tough, durable, will not corrode. Lasts a lifetime.

PLASTIC CLOTH SLEEVE — Seamless orlon or polyethylene. Flexible, strong, woven inert materials that will not corrode, rot or mildew. Flex in tight against the core during the filter run, then flex out with the air bump backwash. This vigorous action "pops-off" the filter cake and keeps the fabric mesh open and clear. This means longer filter runs.

REMOVABLE — Each septum removable without moving the tube sheet.

LIGHT WEIGHT — Only 10 lbs. for a 3 foot length. Easy to handle. Lower shipping costs.

STAINLESS STEEL TIE RODS — Eliminates corrosion and rust.

LONGER, MORE EFFICIENT FILTER RUNS

FILTER TANK
Heavy gauge steel, 100 psi working pressure, 150 psi test pressure. Interior and exterior sandblasted, then three coats of epoxy resin for temperatures up to 140° F. Above 140° F. special coatings are available.

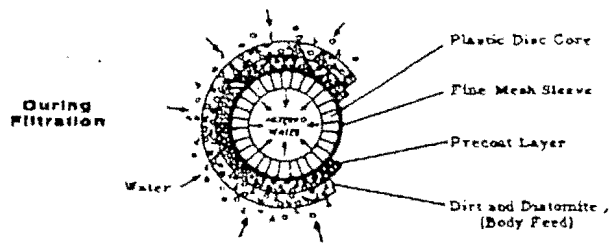
SEPTUM
Features a patented, rigid, lifetime plastic disc core covered with a fine mesh polyethylene sleeve. These plastic materials will not corrode and are easily cleaned. Sleeve may be easily removed and replaced when required.

PRECOAT TANK
By means of this tank diatomite is introduced into the filter to precoat the septum before actual filtration begins.

AIR-VAC SYSTEM
Vigorous air agitation while draining the tank after the "air-bump" provides additional cleaning and flushing action.

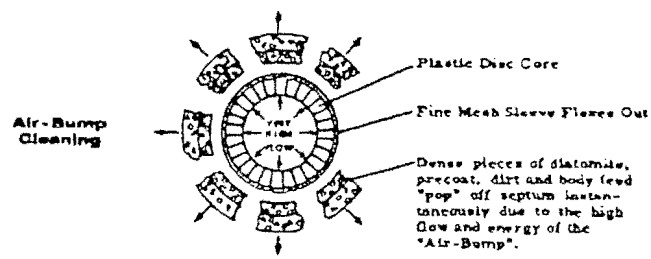
AIR-BUMP BACKWASH VALVE
Quick opening lever operated valve allowing an explosive reverse flow to the drain. Results in rapid, effective septum cleaning.

THE FILTER ACTION



The filter elements are given a diatomite precoat before the filter run. Water pumped into the filter flows through the precoat layer, into the element, then out the top - filtered and crystal clear. To obtain maximum filter runs, additional "body feed" diatomite is fed continuously into the filter. This prevents plugging and keeps the diatomite layer porous for proper filtering action.

AIR-BUMP AND AIR-VAC CLEANING



Instead of ordinary backwashing, which is often ineffective, Separmatic filters use the "AIR-BUMP" principle. Air, trapped in the filter dome, is released suddenly to provide a high energy, reverse flow through the filter. This action effectively pops off the dirty filter cake. During cleaning, the "AIR-VAC" system allows air to enter the tank, producing a vigorous scrubbing action on the surface of each filter element.

STANDARD SIZES

FILTER INCLUDES:

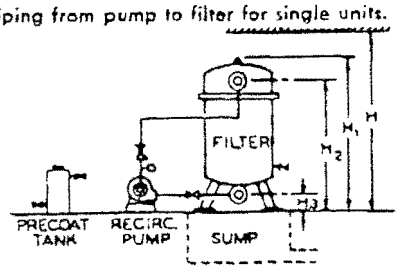
1. Filter tank complete with tubular elements (type must be specified).
2. Operating valves.
3. Air-Vac system.
4. Pressure gauges, air relief line, sight gauge.
5. One pre-coat tank with piping.
6. Piping from pump to filter for single units.

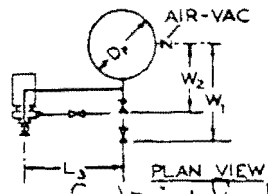
ITEMS NOT FURNISHED

1. Connecting pipe headers for multiple units.
2. Interconnecting piping for precoat recirculation lines on multiple units.

ADDITIONAL ITEMS AVAILABLE

1. Filter pump (minimum total head not less than 60 ft. at design flow and 90 ft. at shut-off). Power 3/60/208, 220-440 Vac.
2. Holding Pump and automatic flow controller. Power 1/60/110 Vac.
3. Body Feed System. Power 1/60/110 Vac.
4. Flow meter.



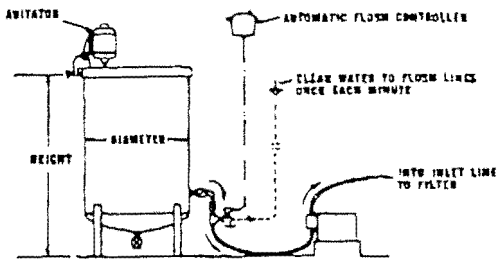


NOTES:

* May be arranged in multiple systems.
† Add 6 in. to D_y to obtain overall diameter.
‡ Sump should be located as close to filter drain as possible. Depth should not be less than filter diameter D_y.

Single Pressure Filter *	Total Filter Area Sq. Ft.	Septum Length Inches	Septum Number	Filter Tank Dia. D_y† Inches	Minimum Head Room H Ft. In.	Approximate Dimensions in Ft.-In. H_1	H_2	H_3 Inches	L_3	W_1	W_2	Valve Size Inches S-Screwed No. 1 Outlet	F-Flanged No. 2 Precoat	F-Flanged No. 4 Drain	Precoat Tank Dia. x Ht. Inches	Precoat Tank Volume Gal.	Approx. Shipping Wt. Lbs.
18P-24	24	36	8	18	7-9	5-10	4-10	3½	2-3	1-9	2-0	2S	1S	2S	8 x 12	2.6	360
24P-36	36	36	12	24	8-0	6-5	5-2	5	2-6	2-3	2-7	2½S	1¼S	2½S	10 x 18	6	695
24P-45	45	36	15	24	8-0	6-5	5-2	5	2-6	2-3	2-7	2½S	1¼S	2½S	10 x 18	6	695
30P-69	69	36	23	30	8-3	6-9	5-4	5½	3-0	2-8	2-11	3S	1½S	3S	10 x 18	6	960
36P-90	90	36	30	36	8-5	7-0	5-8	6	3-6	3-6	3-0	4F	2S	4F	12 x 24	12	1425
36P-111	111	36	37	36	8-5	7-0	5-8	6	3-6	3-6	3-0	4F	2S	4F	12 x 24	12	1425
42P-132	132	36	44	42	8-9	7-5	6-1	7	3-9	4-1	3-6	5F	2S	6F	14 x 30	20	2175
42P-144	144	36	48	42	8-9	7-5	6-1	7	3-9	4-1	3-6	5F	2S	6F	14 x 30	20	2175
48P-171	171	36	57	48	8-10	7-7	6-3	7	3-9	4-4	3-9	6F	2½S	6F	14 x 30	20	2810
48P-192	192	36	64	48	8-10	7-7	6-3	7	3-9	4-4	3-9	6F	2½S	6F	14 x 30	20	2810
48P-224	224	42	64	48	9-10	8-1	6-9	7	3-9	4-4	3-9	6F	2½S	6F	14 x 30	20	2990

BODY FEED SYSTEM



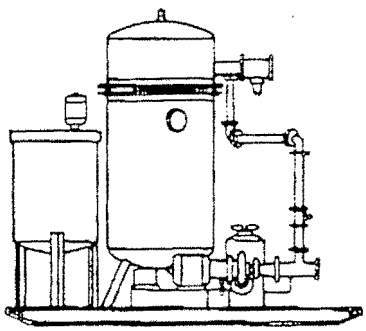
BODY FEED SYSTEM INCLUDES:

1. Body Feed Tank
2. Agitator
3. Body Feed Pump
4. Automatic Flush System
5. Necessary Tubing

SELECT the BODY FEED TANK and BODY FEED PUMP based on the TOTAL FILTER FLO

SIZING BODY FEED TANK AND BODY FEED PUMP				
Total Flow of Filter System GPM	Use Body Feed System	Body Feed Tank Dia.	Body Feed Tank Ht.	Body Feed Pumping Rate * G.P.H.
35 to 500	C-474-1	24"	48"	1.8
505 to 1000	C-482-2	30"	54"	3.5
1005 to 1430	C-482-3	36"	54"	5.1
1435 to 2000	C-482-4	42"	54"	7.0

*Feed pump selected must have this capacity or greater.



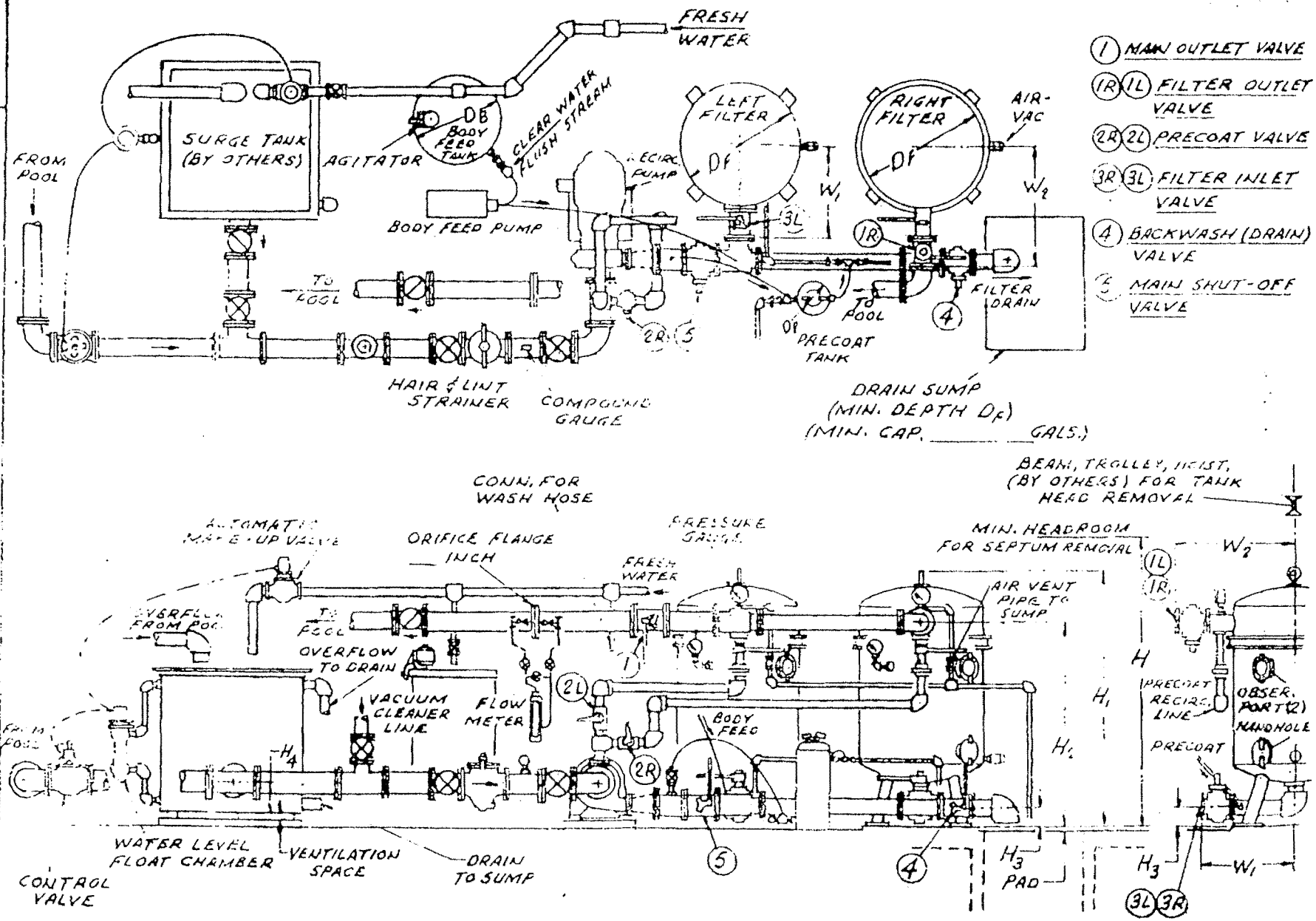
AVAILABLE SKID MOUNTED FOR PORTABILITY

ALSO AVAILABLE FROM SEPARMATIC . . . A COMPLETE LINE OF VACUUM DIATOMITE AND PRESSURE SAND WATER FILTERS.

Write or call for information.

Manufactured and sold by: **SEPARMATIC FILTER COMPANY**
DIVISION OF SEC. CORP.
7628 W. Florist Ave., Milwaukee, WI 53218 (414) 466-5200, FAX (414) 466-5258

NOTE: STANDARD ARRANGEMENT SHOWN, MAY MAY BE VARIED TO SUIT CONDITIONS.



SURGE TANK SYSTEM ELECTRICALLY ACTUATED FLANGED PIPING	PROPOSAL NO.
TWIN UNIT PRESSURE DIATOMITE FILTER SYSTEM	SEPARMATIC FILTER COMPANY MILWAUKEE WISCONSIN
SEPARMATIC	DWG. NO. A-770

2. GRINDER PUMP

Emmons Pump & Control, Inc.

14 Arch Street, Watervliet, NY 12189
Telephone: 518-271-2580 Fax: 518-271-2582

DISTRIBUTORS / REPRESENTATIVES OF QUALITY PUMP PRODUCTS

FAX TRANSMISSION

DATE: 12-22-99

COMPANY: _____

TO: Ivan

FROM: TIM SWAISGOOD

PAGES: 3

371-4356

re:.

EMMONS PUMP & CONTROL INC

14 ARCH STREET
WATERVLIET, NY 12189
TELEPHONE 518-271-2580
FACSIMILE 518-271-2562

INVOICE

Quote Number: 949902

Date: 12/22/99

Page: 1

White Face Ledge

To: IVAN ZORAHAL ASSOCIATES
959 ROUTE 146
CLIFTON PARK, NY
12065

Job Name: IVAN ZORAHAL ASSOCIATES
959 ROUTE 146
CLIFTON PARK, NY
12065

Cust I.D.....: PC0055

Ship Via.: BEST WAY

Job/Order No.: 949902

Terms....: NET 30

Salesperson..: 1

Item I.D./Desc.	Quantity	Unit	Price	Net
51GR6-010-Y HYDROMATIC EXPLOSION PROOF GRINDER PUMP G2FX300JC, 230/460/3/60, 3 HP	2.00	EA	2950.0000	5900.00
EZ-OUT RAIL SYSTEM STEEL O-RING TYPE SEALING FLG W/ GALV. STEEL RAIL GUIDE PLATE, C.I. BASE ELBOW W/ LOWER GUIDE RAIL SUPPORTS, UPPER & INTERMEDIAT RAIL SUPPORTS, LIFTING CHAIN	2.00	EA	656.0000	1312.00
GUIDE RAILS STAINLESS STEEL GUIDERAIL PIPING	40.00	EA	5.0000	200.00
CONTROL PANEL INTRINSICALLY SAFE DUPLEX CONTROL PANEL, AS DISCUSSED	1.00	EA	2900.0000	2900.00
CON2900-4FB FLOAT BRACKET-4-S.S.	1.00	EACH	45.0000	45.00
J-BOX INTRINSICALLY SAFE	1.00	EA	915.0000	915.00
DECJBS16/3 JUNCTION BOX SIMPLEX	1.00	EACH	47.0000	47.00

Continued ..

Subtotal: 11319.00

EMMONS PUMP & CONTROL INC

14 ARCH STREET
WATERVLIET, NY 12189
TELEPHONE 518-271-2500
FACSIMILE 518-271-2502

INVOICE

Quote Number: 949902

Date: 12/22/99

Page: 2

To: IVAN ZDRAHAL ASSOCIATES
959 ROUTE 146
CLIFTON PARK, NY
12065

Job Name: IVAN ZDRAHAL ASSOCIATES
959 ROUTE 146
CLIFTON PARK, NY
12065

Cust I.D.....: PC0055

Ship Via.: BEST WAY

Job/Order No.: 949902
Salesperson..: 1

Terms....: NET 30

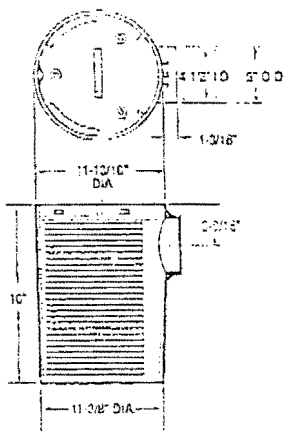
Item I.D./Desc.	Quantity	Unit	Price	Net	T
Freight				200.00	
START-UP ONE DAY OF PUMP START UP	1.00	EA	250.0000	250.00	

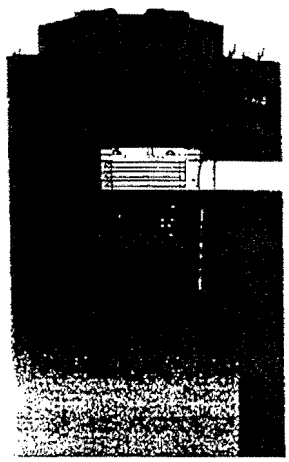
THESE PRICES ARE BASED UPON PREVIOUS DIS
CUSSIONS AND ARE AN ESTIMATE. PRECISE
BIDDING WILL BE PERFORMED AT LATER DATE

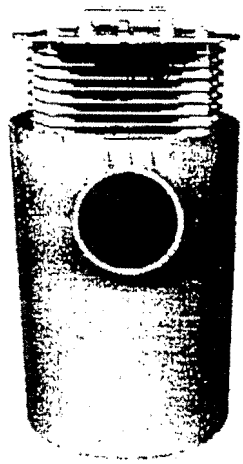
Subtotal: 11769.00
Tax.....: 0.00
Total...: 11769.00

3. EFFLUENT FILTERS BY "ZABEL"

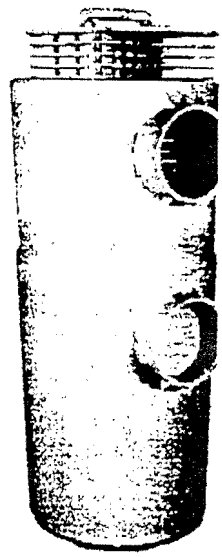
A100s



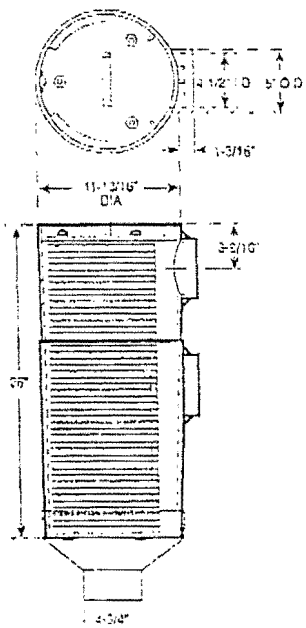


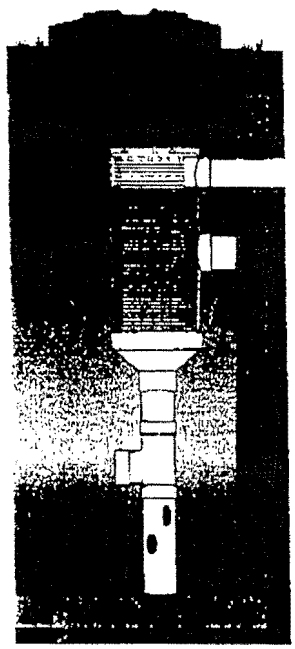


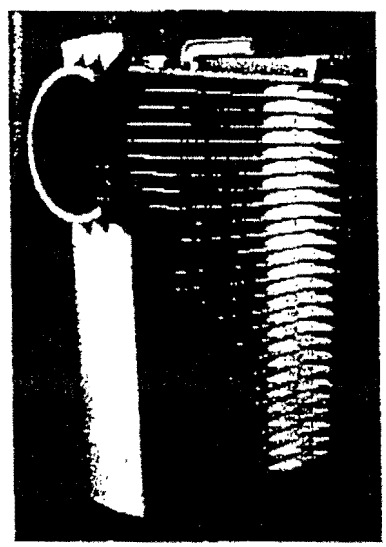
A100



A100-HIP







Zabel™ Recommendation: Any configuration of Risers used **should not** exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584,
U.S. Des. 386,241,349067, 4605501,5098563, Des. 309007, Canadian: 2,135,937 New Zealand: 2648.
Other Patents Pending

Call for a **free** ZABEL ZONE™ *An Onsite Wastewater Magazine* **1-800-221-5742** • Website http://www.zabe

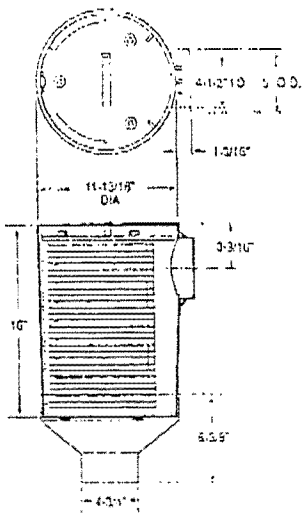
Zabel™ A100 Series
Commercial & Residential Effluent Filter
Product Specification

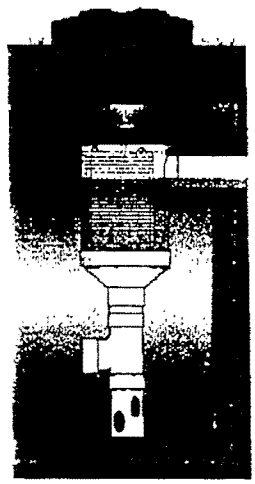
1. Product Name: Zabel™ A100 Commercial & Residential Effluent Filter, U.S. Patent: 4,710,295
2. Model Numbers: A100 Case & Cartridge; A101 Cartridge Only; A100-HIP Case & Cartridge; A101-HIP Cartridge Only
3. Applications: Apartments, trailer parks, schools, churches, shopping centers, and offices; Septic dump stations and community treatment plants; Single and Multi-family homes
4. Performance Specification
   - 4.1. Model A100: 3,000 gpd
   - 4.2. Model A100-HIP: 4,500 gpd
   - 4.3. Multiple filters may be installed in manifolds to handle larger flows. Use a Zabel Flow Control Plate Model FC100 to set the effluent flow to predetermined limits.
   - 4.4. TSS: Reductions in TSS within six months of installation - 50 to 90 percent. The higher the pre-filtered TSS the greater the percentage of reduction.
   - 4.5. BOD_5: Reduction in BOD_5 within six months of installation - 20 to 45 percent is dependent on the make-up of the wastewater.
5. Materials: All materials are non-corrosive. Case & Lid - PVC; Filter discs - Polystyrene; Rods and Nuts-Stainless Steel
6. New System Installation: Center the top of the 12 inch Filter Case under an outlet access opening at least 16 inches in diameter. PVC solvent weld the bell coupling to the 4 inch Schedule 40 PVC exit pipe of the tank as required by local code. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. If required to meet depth requirements, install a Zabel™ Extension Reducer and 4-inch Schedule 40 pipe to the bottom of the filter case. A riser to grade is recommended. High performance double stack (Model A100-HIP) filters and multiple filters installed in manifolds will require additional support and access.
7. Existing System Installation: The filter may be installed in an existing septic tank if an outlet access opening already exists and the filter can be installed without damaging the existing tank. If a 4-inch Schedule 40 PVC pipe does not extend into the tank, the filter can be installed utilizing a plumbing flange. If the existing septic tank cannot be used, the filter can be installed using a Zabel™ Container Assembly Model CA100 or Zeus™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36" T-Handle is available if required to reach filters more than 12 inches below grade. Hose off the cartridge into the tank and reinsert into the case. If required, the filter may be disassembled for further cleaning.
10. Service Frequency: The filter requires cleaning when the septic tank is normally inspected and pumped as required by local regulation. The A100s are designed to slough most normal solids off the inside of the vertical disc dam walls and back into the tank when the effluent flow is in a resting state. Installation of an effluent filter may increase the frequency of service if the homeowner discharges materials that are harmful to the system.
11. Warranty: The A100s are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel's™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.
12. Dimensions:

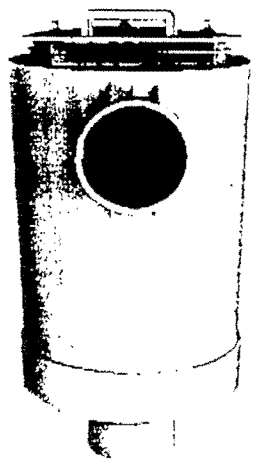
Model	Diameter	Height	Filtration	Settling Area	Total Filter Surface	Lineal Feet of Weir
A100	12"	16"	1/16"	596.16 in²	1,857.6 in²	198
A100-HIP	12"	26"	1/16"	1,018.08 in²	2,908.8 in²	297

PROCEED ON PAGE 78

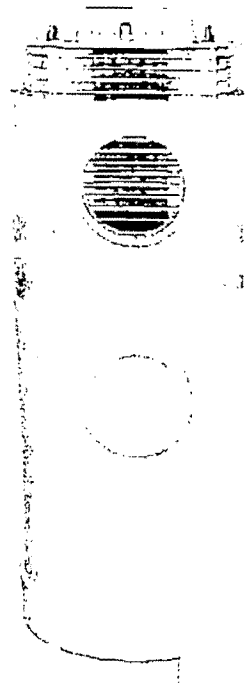
A300s



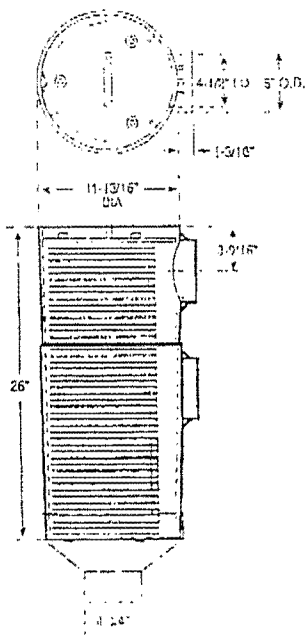


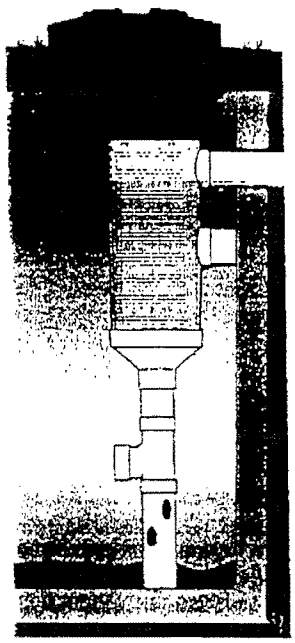


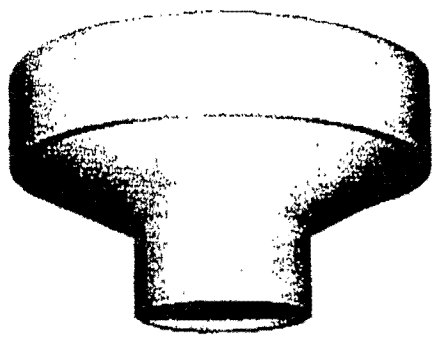
A300



A300-HIP







A300-ADA

Zabel™ Recommendation: Any configuration of Risers used should not exceed 48" in height.

The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584,
U.S. Des. 386,241,349067, 4605501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 26482
Other Patents Pending

Call for a free ZABEL ZONE™ *An Onsite Wastewater Magazine* **1-800-221-5742** • Website http://www.zabel.

Zabel™ A300 Series High Strength Industrial & Commercial Effluent Filter Product Specification

1. Product Name: Zabel™ A300 Industrial & Commercial Wastewater Filter, U.S. Patent: 4,710,295
2. Model Numbers: A300 Case & Cartridge & Reducer; A301 Cartridge Only; A300-HIP Case & Cartridge & Reducer; A301-HIP Cartridge Only
3. Applications: Grease: restaurants; Hair: dog kennels, beauty shops, zoo facilities; Lint: Laundromats; Food processing: wineries, bakeries; Animal wastes: poultry, hog & cattle farms; Apartments, trailer parks, schools, churches, shopping centers, and offices; Septic dump stations and community treatment plants; Single and Multi-family homes
4. Performance Specification
   - 4.1. Model A300: Maximum daily flow - 3,000 gpd
   - 4.2. Model A300-HIP: Maximum daily flow - 4,500 gpd
   - 4.3. Multiple Filters may be installed in manifolds to handle larger flows than those shown above. A Zabel™ Flow Control Plate Model FC100 is available to set the effluent flow of a single filter to pre-determined limits.
   - 4.4. TSS: Reductions in TSS within six months of installation - 50 to 90 percent. The higher the unfiltered TSS, the greater the percentage of reduction.
   - 4.5. BOD_5: Reduction in BOD_5 within six months of installation - 20 to 45 percent is dependent on the make up of the wastewater.
5. Materials: All materials are non-corrosive. Case & Lid - PVC; Filter discs - Polystyrene; Rods and Nuts-Stainless Steel.
6. New System Installation: Center the top of the 12 inch Filter Case under an outlet access opening at least 16 inches in diameter. PVC solvent weld the bell coupling to the 4 inch Schedule 40 PVC pipe of the tank as required by local code. Add 4 inch Schedule 40 pipe to the bottom of the reducer as needed. The PVC outlet pipe should extend at least 18 inches beyond the outside face of the tank wall. A riser to grade is recommended for all commercial and industrial installations. All filters installed in grease interceptor tanks **will require** additional support.
7. Existing System Installation: The filter may be installed in an existing tank if an outlet access opening already exists and the filter can be installed without damaging the existing tank. The filter can also be installed utilizing a plumbing flange. If the existing tank cannot be used, the filter can be installed in existing systems using a Zabel™ Container Assembly Model CA100 or ZEUS™ Basin System.
8. Service: A professional onsite service company should perform all onsite system service.
9. Service Method: Grasp the filter handle and pull the filter cartridge upward. A Zabel™ 36" T-Handle is available if required to reach filters below grade. The filter may be cleaned with a steam wand, chemical degreaser or disassembled for further cleaning.
10. Service Frequency: The A300s are designed to be installed in high strength waste applications. Each application will have to be monitored to determine proper service cycles. See article on "Restaurant Applications for Zabel™ Filters" for recommended guidelines in the Spring/Summer 97' issue.
11. Warranty: The A300s are warranted to be free from defects in material and workmanship for the life of the original purchaser. Zabel's™ liability is limited to repair or replacement of the part and in no event shall Zabel™ be liable for any consequential damages of any kind.

10. Dimensions:

	Diameter	Height	Filtration	Settling Area	Total Volume	Total Filter Area
A300	12"	18"	1/32"	624.69 in²	1,857.6 in²	206
A300-HIP	12"	28"	1/32"	1,067.04 in²	2,908.8 in²	312

55

A100/A300

Zabel™ Filter Installation

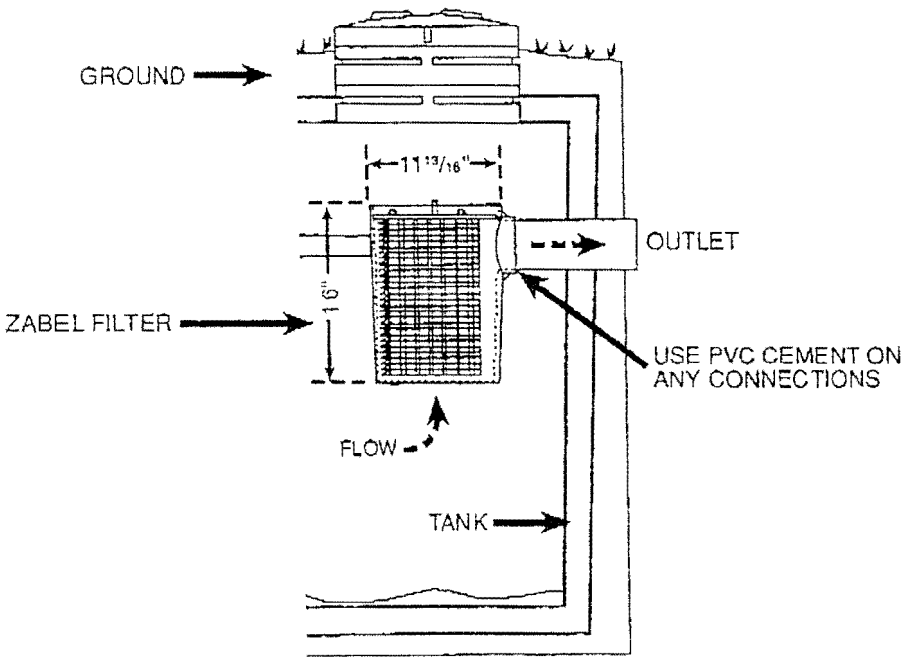
The Model A100/A300 Zabel Filter for commercial/industrial septic tanks is installed in place of the standard outlet tee.

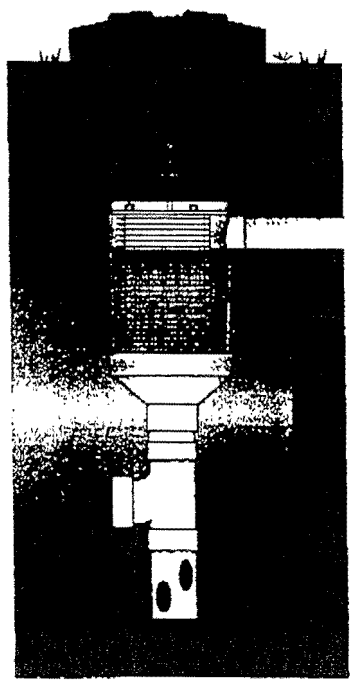
Securely fasten the bell coupling on the side of the filter case by a solvent weld connection to the Schedule 40 PVC plastic pipe which extends through the outlet opening of the septic tank. The Schedule 40 PVC pipe extending through the outlet opening of the tank should be at least 12" or more beyond the tank before being connected by an adaptor to the remainder of the system. This will suspend the filter inside the septic tank by the bell housing on the side of the filter case.

The top of the tank must have an opening 12" in diameter or larger to allow easy removal of the disc dam cartridge for cleaning. If the tank opening over the filter is the only access to the tank for pumping, it should be large enough in diameter to allow the tank to be pumped prior to removing the cartridge for cleaning.

Supplementary Support Method for Installing Zabel Filters:
Installing two or more Zabel Filters in one tank, 18 inches or more from the end of the tank or in high strength waste applications such as restaurants or dog kennels sometimes requires additional support to handle the weight of the filter. Supplementary support can be achieved by following these directions.

Solvent weld the reducer to the bottom of the filter case. Using two pieces of Schedule 40 pipe with an inverted Sanitary Tee located at the clear zone level, extend to the bottom of the tank for support. Make sure the pipe exiting the filter and extending through the tank wall is level. Cut four or more two inch holes in the PVC pipe below the Sanitary Tee to prevent sludge build up in the pipe.





A100/A300

Maintenance

The interval for servicing septic tanks is set by state and local code. Throughout the United States there is a wide divergence of opinion on what this interval ought to be, but most regulatory agencies suggest two to five years. The filter does not increase the frequency of servicing for the tank.

To service the filter, remove the tank cover located over the filter. Pump the tank prior to removing the disc dam cartridge for cleaning to prevent any solids from escaping to the field when the cartridge is removed.

Pull sharply on the lid handle and the disc dam cartridge will slide out of the case. In order to prevent contamination of the ground with septage, turn the cartridge sideways and lay it back in the opening. Now rinse off the cartridge with a garden hose or a fresh water tank hose from the truck, being careful to rinse all septage material back into the tank. It is not necessary that the filter be cleaned "spotless". The biomass growing on the filter aides in the pretreatment process and should be left on the discs.

On rare occasion then it will be necessary to dismantle the cartridge. If required, remove the nuts on the three bolts at the top of the lid and the cartridge can be easily disassembled for cleaning. After the cartridge is cleaned, and reassembled if necessary, place it back in the filter case. Be sure it is all the way in the case until it snaps into place. Replace the septic tank cover.

Easy to maintain • Ecologically Sound

- The filter is virtually self cleaning. The continued action of the anaerobic organisms on the filter discs causes lodged particles to disintegrate and fall to the bottom of the tank.
- The filter only requires servicing at the normal inspection and pumping intervals required of a standard septic installation.
- The filter cartridge is safely hosed off back into the tank by a qualified septic tank pumper.

The product(s) shown are covered by one or more of the following patents:
U.S. 5,382,357, 5,482,621, 5,683,577, 5,580,453, 5,582,716, 5,591,331, 4,710,295, 5,593,584,
U.S. Des. 386,241,349067, 4605501,5098568, Des. 309007, Canadian: 2,135,937 New Zealand: 264824,
Other Patents Pending

Call for a free ZABEL ZONE™ *An Onsite Wastewater Magazine* **1-800-221-5742** • Website http://www.*zabel*.com

4. EFFLUENT PIPING BY "POLY-THERM"

L.J. EARLY CO., INC.

P.O. BOX 11059
ALBANY, NY 12211

MANUFACTURER'S REPRESENTATIVES

TELEPHONE: (518)-465-3566
FAX: (518)-465-9474

November 22, 1999

To: Ivan

From: Denis

Re: Whiteface Mountain

Ivan,

Per your request, we offer the following budget price.

Perma Pipe Polytherm Preinsulated Pipe with following Features and accessories:

- **2" Schedule 40 steel carrier pipe with 2" polyurethane foam insulation in a FRP jacket with special UV inhibitors**
- **Heat Trace**
- **Field Supervision**
- **Based on 40' lengths**

Budget Price $: 27 / LF

Please call with any questions.

Thanks

POLY-THERM

Fiberglass Jacketed Polyurethane Insulated Piping System

The premium quality performance piping system for the distribution of liquids from −250°F to 250°F.

PERMA-PIPE

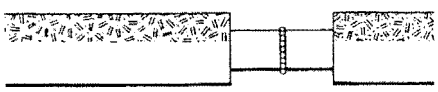
Standard Piece Option for Copper or Steel Piping

In the event that time constraints or field conditions prohibit the use of a fully pre-engineered piping system, POLY-THERM can be provided in standard straight lengths, and prefabricated fittings with fixed length tangents. Contact PERMA-PIPE for further information on this option.

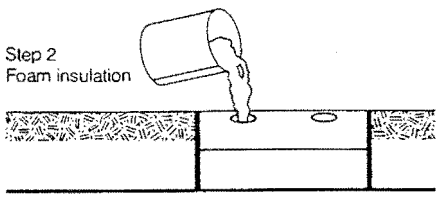
Electric Heat Trace (optional)

FIELD CLOSURE

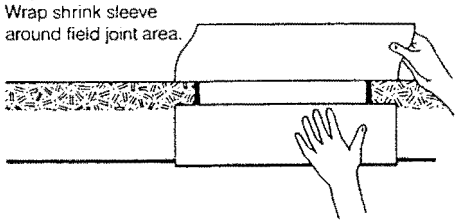
Step 1
Complete carrier pipe joint.

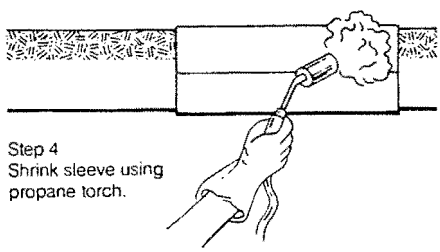


Step 2
Foam insulation



Step 3
Wrap shrink sleeve around field joint area.





Step 4
Shrink sleeve using propane torch.

RECOMMENDED POLY-THERM INSULATION AND JACKET THICKNESS

PIPE SIZE - (In)	1	1.5 - 3	4 - 6	8 - 14	16 - 18	20	22- 24
INSULATION THICKNESS - (In)	1	1.5	2	2.5	3	3	3.5
MINIMUM JACKET THICKNESS - (In)	.055	.055	.055	.085	.085	.110	.110

PHYSICAL PROPERTIES OF POLYURETHANE AND FILAMENT WOUND FRP

POLYURETHANE		FILAMENT WOUND FRP	
Flexural Strength ASTM D-790	25 PSI	Flexural Strength ASTM D-790	25,000 PSI
Compressive Strength ASTM D-1621		Compressive Strength ASTM D-695	60,000 PSI
a) Parallel to rise	17 PSI		
b) Perpendicular to rise	25 PSI	Tensile Strength ASTM O-638	20,000 PSI
K-factor ASTM C-518	.13 $\frac{\text{BTU-in}}{\text{hr-sq ft-°F}}$	Heat Distortion Temp ASTM D-648	250°F
Closed Cell ASTM C-2856	90–95% Min	Izod Impact	40–60 $\frac{\text{ft-lb}}{\text{in-notch}}$

COMPARISON OF HEAT TRANSFER FOR POLYURETHANE VERSUS OTHER INSULATIONS*

PIPE SIZE (in)		2	4	6	8	10	12	16	20	30	36
RECOMMENDED INSULATION THICKNESS (in)		1.5	2	2	2.5	2.5	2.5	3	3	3.5	4
HEAT TRANSFER BTU/HR/FT	URETHANE	14	18	24	25	30	35	36	43	54	57
	FIBERGLASS	23	30	40	40	48	54	59	71	87	92
	FOAMGLASS	36	47	62	62	75	84	91	108	134	141
	BARE PIPE	304	356	397	429	460	487	526	569	663	713

*Based on 200°F Service Temp. and 40°F ambient.

Domestic Hot Water Systems
Geothermal Collection & Distribution
Waste Heat Recovery
Cryogenic Gas Piping
Solar Collection & Distribution
District Heating & Cooling
Process Fluid Transport
Fuel & Heavy Oil Transport
Condensate Return
Chilled Water Distribution

Filament-Wound Fiberglass Jacket

PERMA-PIPE's multi-directional filament winding process produces a high strength fiberglass-reinforced polyester resin jacket over the insulation for maximum insulation protection from the environment. PERMA-PIPE applies this high strength fiberglass jacket to systems having an outside insulation diameter as large as 48 inches. The POLY-THERM jacket is excellent for both belowground and aboveground installations as ultraviolet inhibitors can be added to the resin to retard U.V. degradation for aboveground applications.

Insulation Integrity

In contrast to poured in place insulated piping systems, the POLY-THERM spray process assures void-free insulation. By applying insulation before the jacket is applied, complete visual inspection of the insulation is performed, thus assuring void-free insulation and therefore maximum thermal efficiency to provide optimum performance of cryogenic and heat thermal distribution systems.

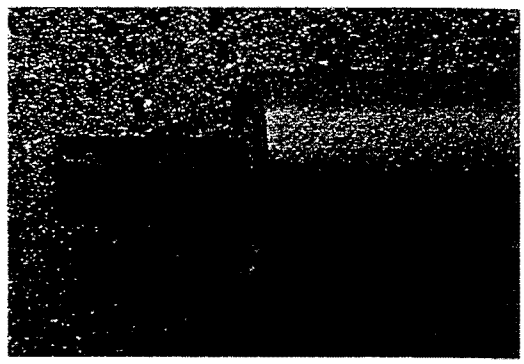
Piping Materials For Any Application

Steel, stainless steel, copper, ductile iron, HDPE, PVC, and FRP can all be supplied in the POLY-THERM system. These materials can be supplied in a wide range of sizes with your exact insulation thickness requirement to meet the need of your application.

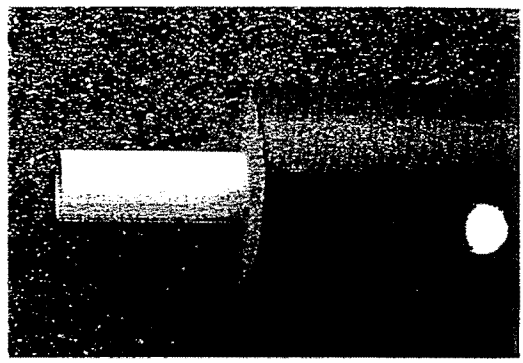
Fully Engineered

The POLY-THERM piping system is completely engineered by PERMA-PIPE's experienced engineering staff. Thermal stress, heat loss/gain, soil loading, and piece part layout are all completed by PERMA-PIPE. The POLY-THERM system is engineered to reduce field costs by providing custom made, factory fabricated, fittings to reduce field connections as compared to the field kit method. By using a factory engineered system, the contractor's time is spent installing pipe; not figuring out where the fitting should be installed and how much pipe to cut.

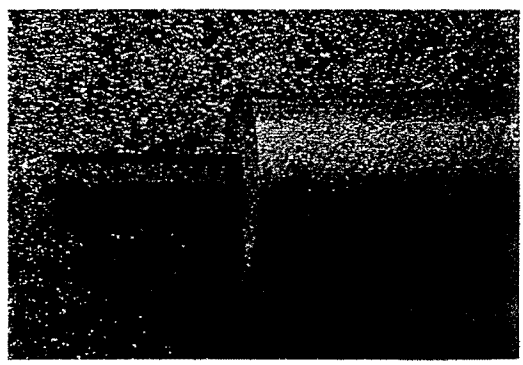
Steel POLY-THERM
The POLY-THERM steel system can be custom fabricated to job site dimensions.



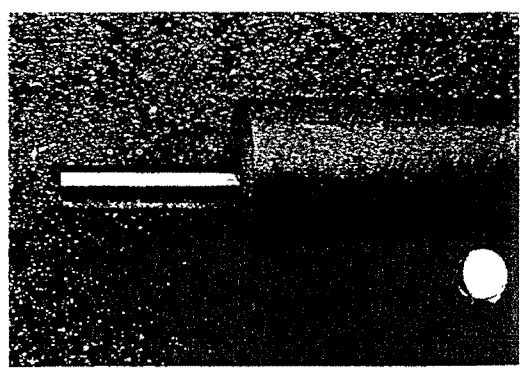
PVC POLY-THERM
POLY-THERM can be supplied with PVC pipe for chilled water applications



FRP POLY-THERM
For condenstate return and low temperature hot water, POLY-THERM can be furnished with FRP carrier pipe.



Copper POLY-THERM
The POLY-THERM system can be supplied with Type K or L copper carrier pipe.



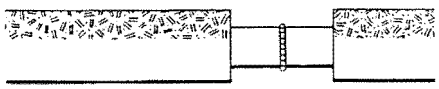
Standard Piece Option for Copper or Steel Piping

In the event that time constraints or field conditions prohibit the use of a fully pre-engineered piping system, POLY-THERM can be provided in standard straight lengths, and prefabricated fittings with fixed length tangents. Contact PERMA-PIPE for further information on this option.

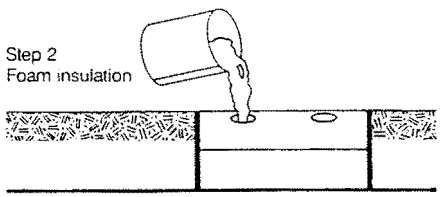
Electric Heat Trace (optional)

FIELD CLOSURE

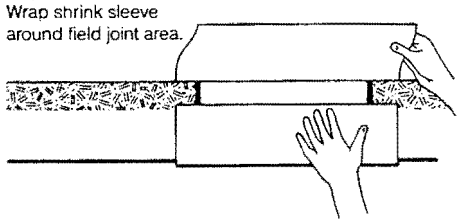
Step 1
Complete carrier pipe joint.

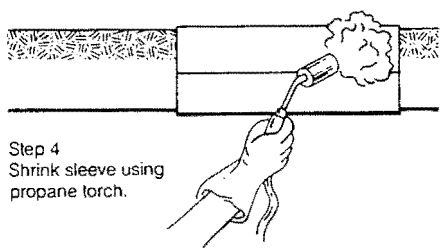


Step 2
Foam insulation



Step 3
Wrap shrink sleeve around field joint area.





Step 4
Shrink sleeve using propane torch.

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K-factor ASTM C-518	.13 $\frac{\text{BTU-in}}{\text{hr-sq ft-°F}}$	Heat Distortion Temp ASTM D-648	250°F
Closed Cell ASTM C-2856	90–95% Min	Izod Impact	40–60 $\frac{\text{ft-lb}}{\text{in-notch}}$

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	FIBERGLASS	23	30	40	40	48	54	59	71	87	92
	FOAMGLASS	36	47	62	62	75	84	91	108	134	141
	BARE PIPE	304	356	397	429	460	487	526	569	663	713

*Based on 200°F Service Temp. and 40°F ambient.

GENERAL

All underground and aboveground chilled water, condensate return, and hot water lines with fluid temperatures up to 250° shall be the POLY-THERM type, as manufactured by PERMA-PIPE. All straight sections, fittings, anchors and other accessories shall be factory fabricated to job dimensions and designed to minimize the number of field welds. Each system layout shall be computer analyzed by the piping system manufacturer to determine stress on the carrier, pipe, and anticipated thermal movement of the service pipe. The system design shall be in strict conformance with ANSI B31.1, latest edition. Factory trained field technical assistance shall be provided for critical periods of installation; unloading, field joint instruction, and testing.

SERVICE PIPING*

Internal piping shall be standard weight carbon steel, except for condensate return lines which shall be Schedule 80. All joints shall be butt-welded for 2½" and greater, and socket or butt-welded for 2" and below. Where possible, straight sections shall be supplied in 40 foot random lengths with piping exposed at each end for field joint fabrication.

ACCESSORIES

End seals, gland seals and achors shall be designed and factory fabricated to prevent the ingress of moisture into the system.

INSULATION

Service pipe insulation shall be spray applied nominal 2 pound per cubic foot density, polyurethane foam for straight sections and preformed polyurethane foam for all fittings. To ensure no voids are present, all insulation shall be inspected by one of the following three methods: visually checked prior to application of the protective jacket; infrared inspection of the entire length; or x-ray inspection of the entire length. The insulation shall be applied to the minimum thickness specified below. The insulation thickness shall not be less than indicated in these specifications.

Pipe Size (in.)	Insulation Thickness (in.)
1	1
1½ - 3	1.5
4 - 6	2
8 - 14	2.5
16 - 20	3
22 - 30	3.5

PROTECTIVE JACKET

All straight sections of the insulated piping system shall be filament wound, polyester resin/fiberglass reinforcement composite directly applied on the insulating foam. Thermoplastic casing material, e.g., PVC or PE, shall not be allowed.

The minimum thickness for FRP jacket shall be as follows: For jacket diameter up to 15.5 inches–thickness = .055 inches; jacket diameter between 15.6 and 24.5 inches–thickness = .085 inches; jacket diameter between 24.6 and 31.0 inches–thickness = 110 inches; and jacket diameter between 31.1 and 40.0 inches–thickness = .140 inches.

All fittings of the insulated piping system shall be prefabricated to minimize field joints and jacketed in a chopped spray-up, polyester resin/fiberglass reinforcement composite, directly applied onto the insulating foam to a thickness related to the filament wound jacket thickness.

FIELD JOINTS

The internal pipe shall be hydrostatically tested to 150 PSIG or 1½ times the operating pressure, whichever is greater. Insulation shall then be poured in place into the field weld area. All field applied insulation shall be placed only in straight sections. Field insulation of fittings shall not be acceptable. The mold for the polyurethane shall be made of clear adhesive backed polyester film. The installer shall seal the field joint area with a heat shrinkable adhesive backed wrap or with wrappings of glass reinforcement fully saturated with a catylzed resin identical in properties to the factory-applied resin. Backfilling shall not begin until the heat shrink wrap has cooled or until the FRP lay-up has cured. All insulation and coating materials for making the field joint shall be furnished by PERMA-PIPE.

BACKFILL

A 4" layer of sand or fine gravel shall be placed and tamped in the trench to provide a uniform bedding for the pipe. The entire trench width shall be evenly backfilled with a similar material as the bedding in 6 inch compacted layers to a minimum height of 6 inches above the top of the insulated piping system. The remaining trench shall be evenly and continuously backfilled in uniform layers with suitable excavated soil.

* For alternate service pipe selections contact PERMA-PIPE for specification details.

PERMA-PIPE®

Your Authorized PERMA-PIPE Representative Is:

PERMA-PIPE, INC.
A Subsidiary of MFRI, Inc.
7720 North Lehigh Avenue
Niles, Illinois 60714-3491
Phone (708) 966-2235
Fax (708) 470-1204

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5. COMPOSTING TOILETS BY "CLIVUS"

Clivus Multrum®, Inc.
15 Union Street
Lawrence, MA 01840-1823
(978) 725-5591 • Fax (978) 557-9658
(800) 4-CLIVUS or (800) 425-4887

clivus® Eco-Logical Resource Retrieval Technology

IVAN ZDRAHAL ASSOCIATES

November 11, 1999

Ivan Zdrahal Associates
959 Route 146
Clifton Park, NY 12065

Re: Day Lodge on Top of Little Whiteface

Dear Mr. Zdrahal

Let me review the considerations for using the compost toilet in a project such as is being planned for Little Whiteface.

Composter Sizing
In order to determine the number and size of compost tanks for this project, we would assume that guests might use the toilet once during a four hour period. The turn-over of guests, assuming the lodge is open longer than four hours, would also have to be taken into account. To this figure, we would add staff at the rate of 3 uses per day. In addition, if there were a large number of special events which would affect the use over time, we would take this into account. With these calculations in hand, we could determine the average uses per day and the uses per day during peak events. We would then compare this information with any requirements for a certain number of fixtures. And if the design called for restrooms in different locations within the structure, i.e., a separate bathroom for staff, etc., this would come into play. For example, if we assume that the total seats (restaurant and cocktail lounge) is 400, with no turn-over, and a staff of 20, the total uses per day would be 460. This number of uses could be handled by three of our largest model, the M35 (see attached specification sheet). The M35 can accommodate 2 toilet fixtures and 2 urinals. So, this number of units might offer a bathroom with 4 toilet fixtures for women, two for men with several urinals.

Building Design
The fundamental requirement for the compost toilet is the need for two levels: a lower level for the compost tank and an upper level for the toilet fixture. I would assume that in a project such as this, excavation for a lower level below grade would be difficult and expensive. Thus, the available height in the lower space may influence the choice of composter model. The M35, as you see from the specification sheet, is 89". I've enclosed other specification sheets for comparison. The lower space should have direct access to the outside of the structure for easy of maintenance. There must be at least 48" in front of the compost tank in order for maintenance to be easily performed. The compost system requires a temperature of approximately 65°F to perform at the rated capacities.

The composter fan is intended to operate continuously to ensure odorlessness. There may be no conventional exhaust fans in the bathroom which might compete with the composter ventilation system. In a large, multi-use space such as a restaurant/lounge in which there are many pieces of equipment with cooling or heating devices, we would suggest that a HVAC engineer determine what is the best method to achieve the minimum 50 CFM per toilet fixture for the compost system. This might call for roof-mounted fans.

Composter End-Products
The compost toilet produces two end-products. Compost liquid fertilizer is a stable, high-nitrogen, nearly odorless liquid, which is generated at the rate of approximately 1 gallon for every 25 uses. Typically, Clivus provides a storage tank (or tanks) to hold this liquid until it can be removed. This liquid can be stored indefinitely. In most cases, unfortunately, regulations prohibit the use of this material as fertilizer. In such cases, the liquid is either put into an on-site septic system or it is hauled away by a septage hauler.

The second product of the Clivus is the solid compost. This material is generated at a much less frequent rate and volume. No solid compost is removed within the first year of operation. In many cases, it is several years before any solid compost is removed. When the volume inside the composter reaches its maximum, only then is material removed, and only a small portion of the total volume is ever taken out at one time. The volume of material would not exceed approximately 30 cu. ft. per removal. Again, although this material has value as a fertilizer and soil amendment, regulations often require that it be disposed of according to septage or sewage regulations.

Budgetary Pricing
Were the bathroom to be configured as I have suggested above, the budgetary price for the compost equipment is $40,000 (FOB job). This includes the composters with necessary components, and all toilet fixtures.

Greywater System
Because in almost every state in the U.S. greywater systems which are not compatible with the compost toilet are not viewed favorably, Clivus Multrum deals primarily with the compost toilet technology. Moreover, such experience as we do have with greywater systems is mostly in residential applications, where the flows are relatively small. However, I'd like to make a couple of observations on the subject of greywater for this project.

With the removal of the conventional toilet system from the facility, the remaining greywater represents a considerable challenge. In a residential application of the Clivus Multrum, it is often the case that a 40% reduction is assumed by regulators. If we were to use this as a benchmark in this case, the GPD of greywater would be approximately 6,000.

Obviously, this volume of water calls for a discharge system, such as a septic system. If a septic system is not possible due to site restrictions, an alternative which might have a chance of being approved is a re-circulating sand filter. My understanding is that these systems have been used successfully in cold climates and that they are not expensive compared with alternatives. If such a system were acceptable to the NYDEC, it would, in all likelihood, require a stream in which the treated greywater could be discharged. I would be glad to provide information on this type of system.

I hope this preliminary information is helpful. Please let me know if you believe I can be of further assistance.

Sincerely,

Don Mills
Sales Director

Eco-Logical Resource Retrieval Technology

M35 SPECIFICATION SHEET

CAPACITY

M35 Volume	234 cubic feet	1747 US gallons
Capacity for daily use at avg. temp. ≥ 65°F:		180 visits
Capacity for annual use at avg. temp. ≥ 65°F:		65,000 visits

SPECIFICATIONS AND MATERIALS

Dimensions

Length: 103" Width: 70.5" Height: 89"
Working Area on Top of Composter: 53"x53"
Waste Access Door: 10"x30" on composter front wall
Compost Access Lid: 34.5"x70.5" on composter front at bottom
Polyethylene Wall Thickness: 3/8" nominal Weight 800 lbs.

Materials

The M35 Composter and its internal Liquid Storage Tanks are rotationally molded using high density cross-link polyethylene resin that conforms with the following specifications:

Density (ASTM TEST D 1505):	0.941 g/cm^3
Tensile Strength at Yield (ASTM D 638):	2600 psi
Impact Brittleness Temperature (ASTM D 746):	<-180°F
Dart Impact (-40°C, 250 mils thickness):	190 ft-lbs.
Envt. Stress Crack Resistance (D 1693)	>1,000 hrs.

Ventilation

AC: 115V, 93w, 60 Hz, .8 amp fan with 243 cfm at free air. Fan made of GE Noryl plastic, totally enclosed, ball-bearing motor, in-line, direct drive. UL and CSA approved. Diameter: 11.75", Inlet/Outlet Diameter: 5.87", Length: 7.757".
DC (optional): 24V available.

Interior Vent Ducting

Wire-reinforced, 6" diameter PVC multi-ply tape construction. One 25' long section is provided; additional sections may be required. 6" Rigid ABS or Schedule 40 PVC may also be used.

Liquid Removal Pump

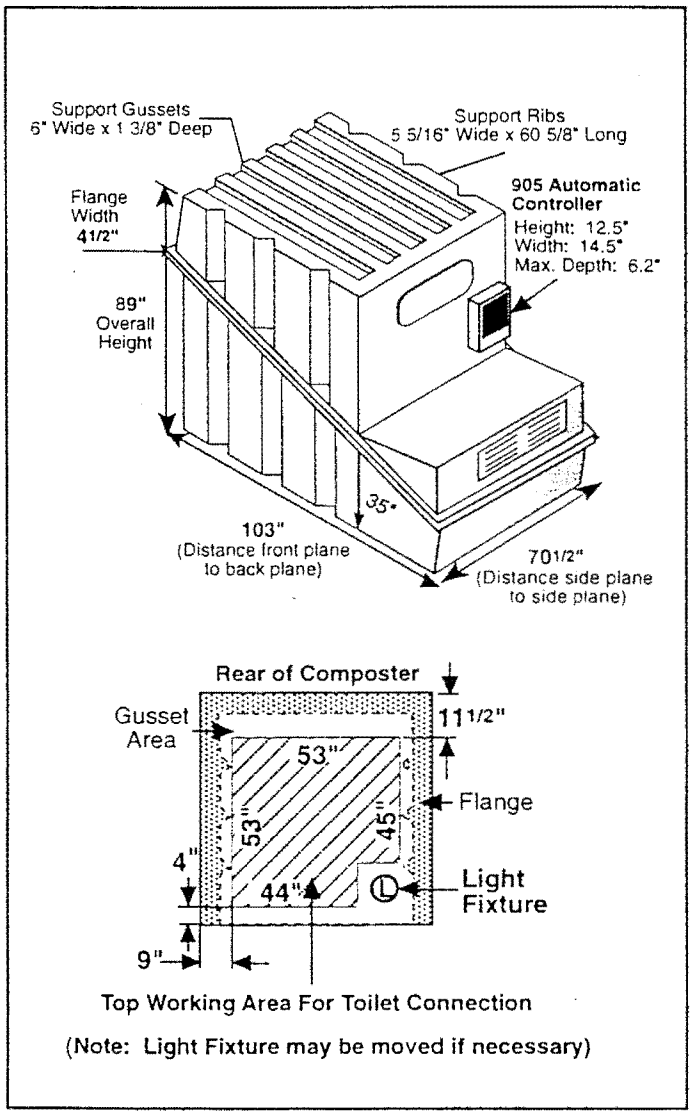
AC: Submersible, 115V, 5 amp, with 18', 3-conductor, oil-resistant cord. UL and CSA approved. 1" NPT liquid discharge outlet. Capacity is 20.4 gallons per minute at 1' with a maximum pumping height of 26.3'.
DC (optional): 24V available.

905 Automatic Controller

Monitors liquid levels, air flow, temperature, pump operation, and composter usage. Controls pump operation in response to liquid levels, automatic daily compost mass moistening, automatic filling of fresh water supply tank, automatic fire suppression and internal chamber light. The 905 Automatic Controller operates on 115VAC electricity. It utilizes 5VDC inputs from switches and sensors, and requires a 20-amp circuit breaker. Outputs for controlling pumps and ventilation systems are 115VAC. The 905 displays information through an LCD panel and provides maintenance alerts through an audible alarm.

ASSEMBLED DIMENSIONS

DRAWING NOT TO SCALE



Fresh Water Storage Tank (internal): (90 gallons)
Supplies fresh water to the Automatic Moistening and Fire Suppression System. Built-in moistening system adds moisture to the compost mass at timed intervals. Fire suppression feature engages if internal temperatures reach 165°F.

Liquid End-Product Storage Tank (internal): (45 gallons)
Stores the liquid separately from the compost to enhance decompostion and to facilitate the removal of the liquid end-product by the automatic pump.

Clivus Multrum®, Inc., 15 Union St., Lawrence, MA 01840
Toll Free: 800-425-4887 Tel: 978-725-5591 Fax: 978-557-9658

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APPENDIX T

SUSTAINABLE SLOPES CHARTER

SUSTAINABLE SLOPES

The environmental charter for ski areas

INTRODUCTION

1

The environment is a ski area's number one asset. The founders of the ski industry recognized that fact 60 years ago in choosing some of the most spectacular terrain for establishing ski areas. The natural surroundings are awe inspiring and provide a backdrop unmatched in any other sport. The premier alpine recreation sites we have today were made possible through the vision, pioneering spirit and hard work of our industry's founders. The value of those efforts holds today, as resorts are showcases of quality recreation opportunities for skiers, snowboarders, and countless summer guests as well. Although many forces may draw us to the slopes—the thrill and excitement of sliding down a mountain, the chance to reconnect with family and friends—we can never underestimate the value of the natural surroundings in renewing the human spirit.

As a society, we now find ourselves needing more than ever to escape every day pressures by heading for the outdoors. With that increasing demand comes impacts and a number of emerging environmental concerns that must be addressed proactively. As an industry, we need to apply the same vision and pioneering spirit of our founders to this new set of challenges. It is not enough to simply provide opportunities for fun and recreation; we must also be part of the solution.

We are taking this collective step of adopting our Environmental Charter to demonstrate our commitment to good environmental stewardship. We do so for a number of reasons. We respect the natural settings that we call home and want the same experience to be available for future generations. We are also keenly aware that our guests take the environment seriously and want us to be the most sustainable operations we can be. This means making efforts in all facets of our operations to use natural resources wisely and ensure that similar opportunities are available for future generations. Individual resorts have made great strides on this front in areas such as water and energy conservation, water quality protection, waste reduction, habitat protection, forest and vegetative management, and air and visual quality protection. This Charter will provide guidance for doing so collectively in the years to come.

This document represents a great deal of input, hard work, and energy from people inside and outside our industry. The National Ski Areas Association's (NSAA) Environmental Committee was instrumental in guiding the development of the Charter over the past year. NSAA's Board of Directors adopted the Mission and Vision statements in October of 1999. The Preamble was developed to convey the context of this Charter, provide background on our industry, and identify the purpose, goals, and limits of the Principles. The industry hosted four regional meetings on the Principles during the

1999/2000 season in Colorado, Oregon, Utah, and Vermont to gain input from stakeholders, including federal, state and local government officials, environmental groups, resorts, other recreation groups and academia. The Keystone Center, an independent non-profit public policy and education organization based in Colorado, facilitated these meetings. Our process was inclusive. In total, we invited more than a thousand individuals to participate, of which 200 provided us input over a nine-month period. A sampling of the Participating Organizations is provided on page 5. The Charter reflects this input, and is a much-improved document because of it.

The Principles are the heart of this Environmental Charter. They provide a framework for resorts across the country to implement best practices, assess environmental performance, and set goals for improvement in the future. Undoubtedly the implementation of these Principles may be more difficult for some resorts than others, as resorts vary greatly in their technical expertise and financial resources. Although we have chosen to use the term "ski area" throughout the Principles, the term encompasses a variety of winter and summer resort operations, from large destination resorts to small, local ski hills. Some of the smaller ski areas, in particular, may need more time to fully implement the Principles. Although there are many differences among ski areas, each shares in common a commitment to improved environmental performance and sound environmental stewardship.

We are fortunate to have a solid group of Partnering Organizations—those organizations that support the development of the Principles and are committed to working with us in the future—on board with this Charter. The Partnering Organizations are listed on page 4. In addition to participating in the stakeholder meetings, the Partnering Organizations attended a meeting in Washington, D.C. in March to provide final input on the Principles. They helped make this process a successful one, and we look forward to working with them in their areas of interest in the future.

The Charter also includes an Environmental Code of the Slopes in recognition of the high priority that our guests place on environmental concerns. The Code was developed with input from the stakeholder process to provide snowsports participants and other guests a role in this Charter. We are committed to heightening their awareness of the industry's efforts and educating them on what they can do to help us make sustainable use of natural resources. An outreach campaign on the Code will be developed and implemented at ski areas beginning next season.

The ski industry has an opportunity to be leaders among outdoor recreation providers and other businesses in promoting environmental awareness and striving to be a model of sustainable development. It is our hope that all ski areas will take advantage of that opportunity by endorsing this Charter, committing to implementing it, and helping us provide information to the public on our collective progress under it.

On behalf of NSAA, we are grateful to all of the individuals, organizations and agencies outside the industry that provided input, and the Keystone Center for their superb facilitation of this process. This is truly a beginning, and we look forward to working with all of you in the years to come.

—Michael Berry, National Ski Areas Association President
June 14, 2000

ENVIRONMENTAL VISION STATEMENT

To be leaders among outdoor recreation providers through managing our businesses in a way that demonstrates our commitment to environmental protection and stewardship while meeting the expectations of the public.

ENVIRONMENTAL MISSION STATEMENT

Ski areas across North America provide a quality outdoor recreation experience in a manner that complements the natural and aesthetic qualities that draw all of us to the mountains. We cherish the outdoors and respect the alpine environment in which we live and work. We are committed to improving environmental performance in all aspects of our operations and managing our areas to allow for their continued enjoyment by future generations.

PARTNERING ORGANIZATIONS

The Principles were developed through a stakeholder process facilitated by the Keystone Center. Input was sought from a wide variety of interests, including federal, state and local governmental agencies, environmental and conservation groups, other outdoor recreation groups, and academia. The "Partnering Organizations" listed below support the ski industry's development of the Principles and are committed to working with the industry on their particular areas of expertise and interest as the industry moves forward to implement the Principles.

Colorado Department of Public Health & Environment
Conservation Law Foundation
U.S. Department of Energy
U.S. Environmental Protection Agency
USDA Forest Service
Leave No Trace Inc.
The Mountain Institute
National Fish & Wildlife Foundation
National Park Service Concession Program
2002 Olympics Salt Lake City Organizing Committee
Teton County, Wyoming
Trust For Public Land

This list will be revised periodically. Please check www.nsaa.org for updates.

The Mountain Institute

CLF Conservation Law Foundation

PARTICIPATING ORGANIZATIONS

Individuals from the following organizations and agencies provided input on the Principles through the stakeholder process. Participation does not imply that these individuals or organizations support the Principles.

The Alford Design Group, Inc.	(Peter Alford, Jr., Peter Alford Sr.)
Cirrus Ecological Solutions	(Neal Artz, Scott Evans)
Citizens Allied for Responsible Growth	(Dana Williams)
Colorado Department of Public Health & Environment	
Colorado Mountain College - Ski Area Operations	(Curtis Bender, Paul Rauschke)
Colorado Ski Country USA	(Melanie Mills)
Conservation Law Foundation	(Mark Sinclair)
Economics Research Associates	(Greg Cory)
Environmental Defense	(Jennifer Pitt)
Green Mountain Club	(Ben Rose)
Innovation Works	(Mary Lou Krambeer)
Jack Johnson Company	(Brooke Hontz, Lauren Loberg)
Kimley-Horn & Associates, Inc.	(Jim Fletcher)
Leave No Trace Inc.	(Amy Mentuck)
Lyndon State College	(Catherine DeLeo, Ph.D.)
National Environmental Trust	(Jan Pendlebury, Kevin Curtis, Laura Culberson, Paul Blackburn, Susan Sargent)
National Fish and Wildlife Foundation	(Cinda Jones)
National Park Service	(Wendy Berhman)
The Nature Conservancy	(Liz Schulte, Angela Koloszar)
Normandeau Associates	(Al Larson, P.G.)
North Fork Preservation Alliance/Sundance Resort	(Mary Morrison)
Northwest Colorado Council of Governments Q/Q Committee	(Lane Wyatt)
ORCA - Trade Association of the Outdoor Industry	(Myrna Johnson)
Pacific Northwest Ski Areas Association	(Doug Campbell)
Park City Municipal Corporation	(Richard Lewis, Myles Rademan)
Pioneer Environmental Services, Inc.	(Roy Hugie)
Outward Bound USA	(Craig Mackey)
Salt Lake Organizing Committee for the Olympic Winter Games of 2002	(Diane Conrad, David Workman)
s.e. group	(Ted Beeler)
Sierra Club - Utah	(Jock Glidden)
Sierra Club - West Virginia	(Paul Wilson)
Ski Areas of New York	(Rob Megnin)
SKI Magazine	(Andy Bigford)
Ski Maine Association	(Greg Sweetser)
The Citizens Committee to Save Our Canyons	(Gavin Noyes)
Surfrider Foundation/Snowrider	(Jen Ader, Darryl Hatheway)
Teton County, Wyoming	(Ann Stephenson)
The Groswold Ski Company	(Jerry Groswold)
The Mountain Institute	(Jane Pratt)
Town of Mammoth Lakes	(Bill Taylor, Mike Vance)
Trout Unlimited - Colorado Chapter	(Melinda Kassen)
Trout Unlimited - Oregon Chapter	(Jeff Curtis)
Trout Unlimited - Utah Chapter	(Paul Dremann)
Trust for Public Land	(Doug Robotham)
University of Colorado - Center for Sustainable Tourism	(Charles Goeldner)
U.S. Department of Energy	
U.S. Environmental Protection Agency	
U.S. Forest Service	
Vermont Natural Resources Council	(Stephen Holmes)
Vermont Ski Areas Association	(Bill Scheer)

PREAMBLE

OUR VALUES

- Like their guests, ski area operators and employees enjoy the outdoors, appreciate the alpine environment and consider it their home. A strong environmental ethic underlies our operations, makes us stewards of the natural surroundings, and is the basis for our commitment to constant improvement in environmental conditions.

- The recreation opportunities that ski areas provide contribute to improving the quality of life for millions of people each year, and the natural surroundings greatly enhance those experiences. In providing quality, outdoor recreation opportunities, we strive to balance human needs with ecosystem protection.

- Ski areas are well suited to accommodate large numbers of visitors because of their infrastructure and expertise in managing the impacts associated with those visits. By providing facilities for concentrated outdoor recreation in limited geographic areas, ski areas help limit dispersed impacts in more remote, wild areas.

- Ski areas operate within and are dependent on natural systems including ecological, climatic and hydrological systems. These dynamic systems can affect our operations, just as we have effects on them. We are committed to working with stakeholders to help understand and sustain the diversity of functions and processes these systems support.

- In addition, ski areas operate within rural and wild landscapes that are valued for their scenic, cultural, and economic characteristics. We are committed to working with stakeholders to understand and help maintain those characteristics which make these landscapes unique.

- Given the ski industry's dependence on weather, climate changes that produce weather patterns of warmer temperatures or decreased snowfall could significantly impact the industry. Accordingly, the industry is committed to better understanding the actual and potential impacts of climate change, reducing its own, albeit limited, emission of greenhouse gases, and educating its customers and other stakeholders about this issue.

- Along with environmental concerns, ski area operators are deeply concerned with the safety of our guests. We take safety into account in the design and operation of ski areas, and in some situations need to place the highest priority on safety.

BACKGROUND ON THE PRINCIPLES

- The ski industry is composed of a diverse group of companies, varying in size, complexity, accessibility to resources, and geographic location. These Principles are meant to be a useful tool for all ski areas, from local ski hills to four season destination resorts, whether on public or private land. Our vision is to have all ski areas endorse these Principles eventually and make a commitment to implementing them. Some smaller areas that endorse these Principles may be limited in their ability to make progress in all of the areas addressed.

- The Principles are voluntary and are meant to provide overall guidance for ski areas in achieving good environmental stewardship, not a list of requirements that must be applied in every situation. Recognition must be made that each ski area operates in a unique local environment or ecosystem and that development and operations may reflect these regional and operational differences. Each ski area must make its own decisions on achieving sustainable use of natural resources. While ski areas have the same goals, they can choose different options for getting there.

- The Principles are meant to go "beyond compliance" in those areas where improvements make environmental sense and are economically feasible. Ski areas should already be meeting all applicable federal, state, and local environmental requirements. Through these Principles, we are striving to improve overall environmental performance, whether it be in the form of achieving efficiencies, sustaining resources or enhancing the public's awareness of our special environment.

- The Principles encourage ski areas to adopt the "avoid, minimize, mitigate" approach to natural resource management. Avoidance should be the first consideration when outstanding natural resources or settings are at stake.

- The Principles recognize that ski areas have some unavoidable impacts. At the same time, ski areas strive to maintain the integrity of the environments in which they operate, by contributing to the sense of place in mountain communities and being good stewards of natural resources.

- The Principles are aimed at improving environmental performance at existing ski areas, and can serve as helpful guidance for planning new developments. The Principles cannot fully address when and where new ski area development should occur, as that issue should be addressed on the merits of each individual project and in consideration of the specific characteristics of a particular location. What might be beneficial development in one location could be inappropriate in another.

- Ski areas are concerned about the larger issues of growth and sustainable development in mountain communities. Key issues of community planning, such as protecting viewsheds, quality of life, and open space, are inherently linked to our business and the quality of experience of our guests. While the Principles cannot address fully some of the larger issues of growth in mountain communities, the ski industry is committed to working with stakeholders to make progress on these issues of concern to mountain communities. Many of the concepts in these Principles can provide leadership in confronting those issues.

- The Principles were developed through a collaborative dialogue process where input and awareness, not necessarily consensus on every issue or by every group, was the goal. The Principles represent the major areas of agreement for ski areas and Partnering Organizations.

- These Principles are a first, collective step in demonstrating our commitment to environmental responsibility. We hope that this initiative will help us better engage our stakeholders in programs and projects to improve the environment.

8 ENVIRONMENTAL PRINCIPLES

VOLUNTARY ENVIRONMENTAL PRINCIPLES FOR SKI AREA PLANNING, OPERATIONS AND OUTREACH*

I. Planning, Design and Construction

In planning and designing trails, base areas and associated facilities, ski areas have the opportunity to explore ways of integrating our operations into natural systems and addressing short and long-term environmental impacts to natural resources. There may also be opportunities to address past disturbances from historical uses that have occurred in the area and mitigate the unavoidable impacts from future ones.

Principles:

- Engage local communities, environmental groups, government agencies and other stakeholders in up front and continuing dialogue on development plans and their implementation
- Assess environmental concerns and potential restoration opportunities at local and regional levels
- Plan, site and design trails, on-mountain facilities and base area developments in a manner that respects the natural setting and avoids, to the extent practical, outstanding natural resources
- Emphasize nature in the built environment of the ski area
- Make water, energy, and materials efficiency and clean energy use priorities in the design of new facilities and the upgrading of existing facilities
- Use high-density development or clustering to reduce sprawl, provide a sense of place, reduce the need for cars and enhance the pedestrian environment
- Meet or exceed requirements to minimize impacts associated with ski area construction

Options for getting there:

- ✓ Engaging stakeholders collaboratively on the siting of improvements and the analysis of alternatives
- ✓ Complementing local architectural styles, scale, and existing infrastructure to enhance the visual environment and create a more authentic experience for guests
- ✓ Respecting outstanding natural resources and physical "carrying capacity" of the local ecology in planning new projects
- ✓ Using simulation or computer modeling in planning to assist with analyzing the effects of proposals on key natural resources and viewsheds such as visual modeling or GIS
- ✓ Designing trails with less tree removal and vegetation disturbance where feasible
- ✓ Incorporating green building principles, such as using energy, water and material efficiency techniques and sustainable building practices
- ✓ Using long-life, low maintenance materials in building
- ✓ Including parks, open space and native landscaping in base area developments
- ✓ Seeking opportunities for environmental enhancement and restoration
- ✓ Maximizing alternate transportation modes in and around the base area
- ✓ Minimizing road building where practical
- ✓ Selecting best management practices (BMPs) for construction sites with stakeholder input
- ✓ Applying sound on-mountain construction practices such as over-snow transport techniques, stormwater control or phasing of activities to minimize disturbances to natural habitats

*These Principles are voluntary and are not intended to create new legal liabilities, expand existing rights or obligations, waive legal defenses, or otherwise affect the legal position of any endorsing company, and are not intended to be used against an endorser in any legal proceeding for any purpose.

II. Operations

In the day-to-day operation of ski areas and associated facilities, there are many opportunities for stewardship, conserving natural resources, and achieving efficiencies. Taking advantage of these opportunities will not only benefit the environment, but can also result in long-term cost savings.

Water Resources

Water is an important resource for ski areas as well as the surrounding natural environments and communities, and should be used as efficiently and effectively as possible.

Water Use for Snowmaking

Principles:

- Optimize efficiency and effectiveness of water use in snowmaking operations
- Conduct snowmaking operations in a manner that protects minimum stream flows and is sensitive to fish and wildlife resources (see Fish & Wildlife Principles on page 14).

Options for getting there:

- ✓ Using appropriate technology and equipment to optimize efficiency
- ✓ Inspecting and monitoring systems to reduce water loss
- ✓ Using reservoirs or ponds to store water for use during low flow times of the year and to maximize efficiency in the snowmaking process
- ✓ Working with local water users and suppliers to promote in-basin storage projects to offset low flow times of the year
- ✓ Installing water storage facilities to recapture snowmelt runoff for reuse
- ✓ Inventorying water resources and monitoring seasonal variations in stream flows
- ✓ Supporting and participating in research on the ecological impacts of snowmaking

Water Use in Facilities

Principle:

- Conserve water and optimize efficiency of water use in ski area facilities

Options for getting there:

- ✓ Conducting water use audits and investigating methods and alternative technologies to reduce water consumption
- ✓ Installing water efficient equipment in facilities such as low-flow faucets and toilets
- ✓ Participating in existing water conservation and linen and towel re-use programs such as EPA's WAVE® and Project Planet® programs for lodging
- ✓ Educating guests and employees about the benefits of efficient water use

Water Use For Landscaping and Summer Activities

Principle:

- Maximize efficiency in water use for landscaping and summer activities

Options for getting there:

- ✓ Incorporating water efficiency BMPs in planning and design phases
- ✓ Planning summer uses in conjunction with winter uses to maximize the efficiency of necessary infrastructure
- ✓ Using drought-tolerant plants in landscaped areas
- ✓ Using native plant species where appropriate
- ✓ Using water efficient irrigation and recycling/reuse technologies
- ✓ Using compost in soil to increase water retention and reduce watering requirements
- ✓ Inspecting and monitoring systems to reduce water loss
- ✓ Watering at appropriate times to minimize evaporation
- ✓ Educating employees about efficient water use

Water Quality Management

Principle:

- ◆ Meet or exceed water quality-related requirements governing ski area operations

Options for getting there:

- ✓ Participating in watershed planning, monitoring and restoration efforts
- ✓ Using appropriate erosion and sediment control practices such as water bars, revegetation and replanting
- ✓ Maintaining stream vegetative buffers to improve natural filtration and protect habitat
- ✓ Applying state-of-the-art or other appropriate stormwater management techniques
- ✓ Utilizing oil/water separators in maintenance areas and garages
- ✓ Using environmentally sensitive deicing materials
- ✓ Encouraging guests to follow the Leave No Trace™ principles of outdoor ethics

Wastewater Management

Principle:

- ◆ Manage wastewater in a responsible manner

Options for getting there:

- ✓ Planning for present and future wastewater needs with adjacent communities
- ✓ Using appropriate wastewater treatment technology or alternative systems to protect water quality
- ✓ Connecting septic systems to municipal wastewater systems where appropriate
- ✓ Exploring the use of decentralized or on-site treatment technologies where appropriate
- ✓ Re-using treated wastewater/greywater for non-potable uses and appropriate applications
- ✓ Monitoring wastewater quality

Energy Conservation and Use

Ski areas can be leaders in implementing energy efficiency techniques and increasing the use of renewable energy sources within their operations to conserve natural resources, reduce pollution and greenhouse gases and reduce the potential impacts of climate change.

Energy Use for Facilities

Principles:

- Reduce overall energy use in ski area facilities
- Use cleaner or renewable energy in ski area facilities where possible
- Meet or exceed energy standards in new or retrofit projects

Options for getting there:

✓ Auditing current usage levels, and targeting areas for improvement
✓ Developing an energy management plan that addresses short and long term energy goals, staffing, and schedules for new and retrofit projects
✓ Orienting buildings and their windows to maximize natural light penetration, reduce the need for artificial lighting and facilitate solar heating and photovoltaic electricity generation
✓ Using solar heating or geothermal heat pumps for heating air and water
✓ Using timing systems, light management systems and occupancy sensors
✓ Performing lighting retrofits to provide more energy efficient lamps, retrofitting exit signs to use low watt bulbs, calibrating thermostats, and fine tuning heating systems
✓ Using peak demand mitigation, distributed, on-site power generation and storage, and real time monitoring of electricity use
✓ Working with utilities to manage demand and take advantage of cost sharing plans to implement energy savings
✓ Entering into load sharing agreements with utilities for peak demand times
✓ Partnering with the U.S. Department of Energy and state energy and transportation departments to assist with energy savings and transit programs
✓ Participating in energy efficiency programs such as EPA/DOE's Energy Star™
✓ Educating employees, guests and other stakeholders about energy efficient practices
✓ Installing high efficiency windows, ensuring that all windows and doorways are properly sealed and using insulation to prevent heating and cooling loss
✓ Minimizing energy used to heat water by using low-flow showerheads, efficient laundry equipment, and linen and towel re-use programs
✓ Investing in cleaner or more efficient technologies for power generation, including wind, geothermal, and solar power generation, fuel cells and natural gas turbines and generation from biomass residues and wastes
✓ Purchasing green power, such as wind-generated power, from energy providers

Energy Use for Snowmaking

Principles:

- Reduce energy use in snowmaking operations
- Use cleaner energy in snowmaking operations where possible

Options for getting there:

✓ Using high efficiency snow guns and air compressors for snowmaking operations
✓ Upgrading diesel motors or converting them to alternative clean energy generation sources
✓ Using real time controls, sensors and monitoring systems to optimize the system and reduce electrical demand

✓ Using on mountain reservoirs and ponds to gravity feed snowmaking systems where possible
✓ Using distributed, on-site power generation to avoid or reduce peak demands from the utility grid
✓ Purchasing green power from energy providers

Energy Use for Lifts

Principles:
- Reduce energy use in lift operations
- Use cleaner energy in lift operations where possible

Options for getting there:
✓ Using high efficiency motors
✓ Upgrading diesel motors or converting them to alternative clean energy sources, such as fuel cells or microturbines
✓ Using renewable energy sources
✓ Purchasing green power from energy providers

Energy Use for Vehicle Fleets

Principles:
- Reduce fuel use in vehicles used for ski area operations
- Use cleaner fuel where possible

Options for getting there:
✓ Providing shuttles or transportation for guests and employees
✓ Using energy efficient vehicles
✓ Using alternative fuel or hybrid electric engines in ski area fleet vehicles including shuttles, trucks, snowcats and snowmobiles
✓ Conducting regular maintenance on fleet vehicles

Waste Management

The Principles below incorporate the "REDUCE, REUSE, RECYCLE" philosophy of waste management to help ensure materials are being used efficiently and disposed of only after consideration is given to reusing or recycling them. Reducing waste helps protect natural resources, reduce pollution, greenhouse gases and energy use by decreasing the need to produce new materials, and minimizes disposal costs.

Waste Reduction

Principle:
- Reduce waste produced at ski area facilities

Options for getting there:

- ✓ Conducting an audit of waste production to establish a baseline and track progress toward reduction
- ✓ Purchasing recycled products
- ✓ Purchasing products in bulk to minimize unnecessary packaging
- ✓ Encouraging vendors to offer "take-backs" for used products
- ✓ Educating guests and employees about reducing wastes generated at the area and following the Leave No Trace™ Principles such as "pack it in, pack it out"

Product Reuse

Principle:

- Reuse products and materials where possible

Options for getting there:

- ✓ Using washable or compostable tableware/silverware in cafeterias and lodges
- ✓ Encouraging guests to reuse trail maps
- ✓ Composting food wastes, grass clippings, and woody debris for use in landscaping and revegetation areas
- ✓ Exploring opportunities for reusing products (e.g., building materials, lift parts and equipment, and office supplies)
- ✓ Joining EPA's WasteWise® program

Recycling

Principle:

- Increase the amount of materials recycled at ski areas where possible

Options for getting there:

- ✓ Making recycling easy for guests by offering containers and displaying signage in facilities and lodges
- ✓ Recycling office paper, cardboard, newspaper, aluminum, glass, plastic and food service waste
- ✓ Recycling building materials as an alternative to landfilling
- ✓ Partnering with local governments on recycling in remote communities where recycling programs are not readily available
- ✓ Encouraging vendors to offer recycled products for purchase
- ✓ Educating guests and training employees on recycling practices
- ✓ Setting purchasing specifications to favor recycled content and specifying a portion of new construction to require recycled content

Potentially Hazardous Wastes

Principle:

- Minimize the use of potentially hazardous materials, the generation of potentially hazardous wastes and the risk of them entering the environment

Options for getting there:

- ✓ Safely storing and disposing of potentially hazardous materials such as solvents, cleaning materials, pesticides and paints

- ✓ Recycling waste products such as used motor oil, electric batteries, tires and unused solvents
- ✓ Reshelving and reusing partially used containers of paint, solvents, and other materials
- ✓ Purchasing non-hazardous products for use when effective
- ✓ Properly managing fuel storage and handling
- ✓ Maintaining or upgrading equipment to prevent leaks
- ✓ Initiating programs to reduce the occurrence of accidental spills or releases
- ✓ Installing sedimentation traps in parking lots
- ✓ Educating employees on the requirements for properly handling hazardous wastes
- ✓ Reclaiming spent solvents
- ✓ Coordinating with local area emergency planning councils for response in case of a spill or release

Fish and Wildlife

Ski areas operate within larger ecosystems and strive to be stewards of fish and wildlife habitats. They need the cooperation of other landowners, managers, local communities and other stakeholders for an effective ecosystem management approach. There are measures ski areas can take to better understand, minimize, and mitigate impacts to fish and wildlife, and in some cases, enhance habitat, particularly for species of concern. The benefits of these measures include promoting biodiversity and the natural systems that attract guests to the mountain landscape.

Principle:

- ◆ Minimize impacts to fish and wildlife and their habitat and maintain or improve habitat where possible

Options for getting there:

- ✓ Supporting and participating in research of fish and wildlife populations and their interactions with ski areas
- ✓ Inventorying and monitoring fish and wildlife and their habitat, particularly protected species
- ✓ Using snowmaking storage ponds or reservoirs to store water for use during times of low stream flows to help protect aquatic habitat
- ✓ Conducting activities and construction with sensitivity to seasonal wildlife patterns and behavior
- ✓ Siting and designing trails and facilities to include gladed skiing areas, linkage of ungladed areas to maintain blocks of forested corridors and inter-trail islands to reduce fragmentation where appropriate
- ✓ Limiting access to, or setting aside, certain wildlife habitat areas
- ✓ Using wildlife-proof dumpsters or trash containers
- ✓ Creating or restoring habitat where appropriate, either on- or off-site
- ✓ Using land conservation techniques such as land exchanges and conservation easements as vehicles for consolidating or protecting important wildlife habitat
- ✓ Participating in ecosystem-wide approaches to wildlife management
- ✓ Providing wildlife education programs for employees, guests, and the local community such as Skecology® and the Leave No Trace™ Principles of respecting wildlife

Forest and Vegetative Management

Ski areas recognize the importance of stewardship in managing the forests and vegetation that support ecosystems and allow for public recreation opportunities. Sound forest and vegetative management can benefit fish and wildlife habitat, water quality and viewsheds and reduce erosion, pollution, and greenhouse gases.

Principle:

- Manage effects on forests and vegetation to allow for healthy forests and other mountain environments

Options for getting there:

- ✓ Inventorying and monitoring forest and vegetative resources
- ✓ Adopting vegetative management plans
- ✓ Minimizing the removal of trees through the careful siting and design of trails
- ✓ Using over-snow skidding to remove logs for new runs during times of sufficient snow cover
- ✓ Using aerial logging where economically feasible
- ✓ Removing dead and diseased trees, with consideration to habitat value, to promote healthy forests and public safety
- ✓ Revegetating roads that are no longer used
- ✓ Revegetating disturbed areas with native plant species and grasses, recognizing that faster growing, non-native species may be needed to address erosion
- ✓ Revegetating disturbed areas as quickly as possible following disturbance
- ✓ Limiting disturbance to vegetation during summer activities
- ✓ Assessing the role of forest stands in reducing greenhouse gases
- ✓ Providing signage informing guests of sensitive vegetation areas
- ✓ Using traffic control measures, such as rope fences, on areas with limited snow coverage to protect sensitive vegetation and alpine tundra
- ✓ Reducing or eliminating snowcat and snowmobile access to sensitive areas with limited snow coverage
- ✓ Planting at appropriate times to minimize water use while optimizing growth
- ✓ Employing practices to control invasive or noxious weeds

Wetlands & Riparian Areas

Ski areas recognize that wetlands and riparian areas are crucial components of the alpine ecosystems in which they operate.

Principle:

- Avoid or minimize impacts to wetlands and riparian areas, and offset unavoidable impacts with restoration, creation or other mitigation techniques

Options for getting there:

- ✓ Inventorying and monitoring wetland and riparian areas
- ✓ Limiting snowmaking and grooming equipment access to wetlands and riparian areas if snow cover is inadequate to protect them

- ✓ Limiting guest access to wetlands and riparian areas and vernal pools if snow cover is inadequate to protect them
- ✓ Engaging in restoration, remediation and protection projects
- ✓ Establishing buffers and setbacks from wetland and riparian areas in summer
- ✓ Managing snow removal and storage to avoid impacting wetlands and riparian areas as feasible
- ✓ Supporting or participating in research on functions of wetland habitats and riparian areas
- ✓ Using trench boxes to minimize impacts to forested wetlands from construction of utility lines

Air Quality

Ski area guests and operators value fresh air as an integral part of the skiing experience. Although there are many sources in and around the community that, combined, may compromise air quality, ski areas can do their share to help minimize impacts. Some of the many benefits of cleaner air and reduced air pollution include enhanced visibility and lessening human influences on climate change, which is of particular concern to ski areas given their location.

Principles:

- Minimize ski area impacts to air quality
- Reduce air pollution and greenhouse gas emissions as feasible

Options for getting there:

- ✓ Reducing air pollutants and greenhouse gas emissions from buildings, facilities and vehicles through clean energy and transportation-related measures identified in these Principles
- ✓ Using dust abatement methods for dirt roads during summer operations and construction
- ✓ Revegetating as appropriate to control dust
- ✓ Reducing the sanding and cindering of ski area roads by using alternative deicing materials
- ✓ Sweeping paved parking lots periodically
- ✓ Reducing burning of slash through chipping or other beneficial uses
- ✓ Limiting wood burning fireplaces or using cleaner burning woodstoves and fireplaces and installing gas fireplaces
- ✓ Working with local and regional communities to reduce potential air quality impacts

Visual Quality

Scenic values are critical to surrounding communities and the experience of guests. Although ski area development is a part of the visual landscape in many mountain areas, it can be designed and maintained in a manner that complements the natural setting and makes the natural setting more accessible to guests. Where opportunities for collaboration exist, ski areas should also consider working with appropriate partners in the protection of open lands that help define the visual landscape in which their guests recreate.

Principles:

- Create built environments that complement the natural surroundings
- Explore partnerships with land conservation organizations and other stakeholders that can help protect open lands and their role in the visual landscape

Options for getting there:

- ✓ Planning with landscape scenic values in mind
- ✓ Minimizing ridgeline development where feasible
- ✓ Promoting protection of open space elsewhere in the community to enhance regional viewsheds
- ✓ Applying local architectural styles and highlighting natural features to minimize disruption of the visual environment and create a more authentic experience
- ✓ Using visual simulation modeling in siting, planning and design to assist in demonstrating visual effects of projects
- ✓ Designing lifts and buildings to blend into the natural backdrop or complement the natural surroundings
- ✓ Constructing trails to appear as natural openings
- ✓ Using non-reflective building products and earth tone colors on structures
- ✓ Planting trees or other vegetation to improve visual quality
- ✓ Incorporating low level lighting or directional lighting to reduce impacts of lights on the night sky while recognizing safety, security, and maintenance needs
- ✓ Keeping parking areas free of debris and garbage
- ✓ Placing existing and new utility lines underground to reduce visual impacts

TRANSPORTATION

Travel to and within ski areas has unavoidable impacts. Through transportation initiatives, ski areas can do their part to help ease congestion and impacts to air quality and improve the ski area experience. (See related topic of ski area vehicle fleets under Energy Principles.)

Principle:

- Ease congestion and transportation concerns

Options for getting there:

- ✓ Providing employee transportation benefits, including shuttles, bus passes or discounts, van pools, and ride-share incentives
- ✓ Providing and promoting ski area guest transportation through shuttles or buses
- ✓ Offering and promoting carpooling or HOV incentives for guests such as discounts or preferred parking in proximity to lodges
- ✓ Offering and promoting non-peak travel incentives for guests such as Sunday night stay discounts
- ✓ Increasing density in base area development when appropriate to reduce the need for vehicle use
- ✓ Supporting and participating in transit initiatives in the community and region
- ✓ Working with travel agents to market and promote "car free" vacation packages

III. Education and Outreach

Because of their setting in an outdoor, natural environment and the clear connection between that natural environment and the guest experience, ski areas have an excellent opportunity to take a leadership role in environmental education and in enhancing the environmental awareness of their guests, surrounding communities, and employees.

Principles:

- Use the natural surroundings as a forum for promoting environmental education and increasing environmental sensitivity and awareness
- Develop outreach that enhances the relationship between the ski area and stakeholders and ultimately benefits the environment

Options for getting there:

- ✓ Training employees and informing guests of all ages about the surrounding environment
- ✓ Promoting the Environmental Code of the Slopes®
- ✓ Educating stakeholders about these Principles and the Environmental Charter for Ski Areas
- ✓ Providing leadership on environmental concerns with particular importance to the alpine or mountain environment, such as climate change
- ✓ Dedicating personnel to environmental concerns and incorporating environmental performance measures and expectations into departmental goals
- ✓ Dedicating a portion of the ski area's website to environmental excellence and the Environmental Charter
- ✓ Offering Skecology® or other environmental education and awareness programs that provide on-mountain instruction and offer classroom information for use in schools
- ✓ Partnering with local school systems, businesses and the public on initiatives and opportunities for protecting and enhancing the environment
- ✓ Displaying interpretive signs on forest resources, vegetative management and fish and wildlife
- ✓ Publicly demonstrating a commitment to operating in an environmentally sensitive manner by adopting these Principles or addressing environmental considerations in company policies or mission statements
- ✓ Creating funding mechanisms for environmental outreach projects
- ✓ Promoting the ski area's environmental success stories or specific measures taken to address water, energy, waste, habitat, vegetation, air quality, visual quality or transportation concerns
- ✓ Encouraging employees to participate in community environmental initiatives
- ✓ Supporting initiatives to reduce snowmobile noise and emissions
- ✓ Asking guests their opinions about ski area environmental programs and initiatives and using their feedback to improve programs and the guests' experiences.

NEXT STEPS FOR SKI AREAS

- Endorsing the Environmental Charter and making a commitment to implement the Principles over time.
- Adopting environmental mission statements, policies or programs that reflect or expand upon the Environmental Charter and demonstrate your commitment to environmental protection and stewardship.
- Designating an "Environmental Charter contact" at your resort.
- Conducting audits and gathering data to measure, document, and report your progress toward implementing the Principles.
- Using the Principles as a framework, targeting areas for improved environmental performance.
- Supporting research on, exploring, and applying technologies that conserve natural resources.
- Developing comprehensive programs for waste reduction, product reuse and recycling.
- Participating in existing programs that help foster effective environmental management and policies or measure environmental improvements.
- Developing Environmental Management Systems over time which are tailored to your operations.
- Sharing data and innovative environmental solutions with other resorts and the industry as possible.
- Taking active steps to educate employees, guests, and the general public about the Environmental Charter and the ski area's environmental policies and practices.

ENVIRONMENTAL CODE OF THE SLOPES®

WHAT SKIERS, SNOWBOARDERS AND SKI AREA GUESTS CAN DO TO HELP

- Follow the Leave No Trace™ Principles of outdoor ethics when visiting ski areas:
  - **Plan ahead and prepare:** Know the regulations and special concerns for the area you'll visit, prepare for winter weather, and consider off-peak visits when scheduling your trip.
  - **Dispose of waste properly:** Recycle your glass, plastics, aluminum and paper at resorts. Reuse trail maps on your next visit or recycle them rather than throwing them away. Never throw trash, cigarette butts or other items from the lifts.
  - **Respect wildlife:** Observe trail closures, seasonal closures, and ski area boundaries. These closures are in place not only for your safety, but the well being of plants and animals located in sensitive areas. In summer, stick to designated trails when hiking and biking to avoid disturbances to vegetation and wildlife.
  - **Be considerate of other guests:** Respect other guests, protect the quality of their experience, and let nature's sounds prevail.

- Carpool with friends and family or use transit to avoid traffic when travelling to and within the ski area.

- Turn off the lights when leaving your room and reuse bath towels and linens to help conserve energy and water.

- Use washable tableware and silverware in cafeterias and lodges instead of paper or plastics to help us reduce waste.

- Take advantage of environmental or alpine education programs offered at ski areas to learn more about the surrounding environment and how to help protect it.

- If you have kids, get them involved in environmental and alpine education programs at a young age.

- Support "clean up days" or other environmental programs at your local ski area.

- Provide feedback and let ski areas know how they can improve their environmental performance.

ENDORSING SKI AREAS

THE FOLLOWING SKI AREAS HAVE ENDORSED THE ENVIRONMENTAL CHARTER AND ARE COMMITTED TO IMPLEMENTING THE PRINCIPLES.

Alpine Meadows Ski Resort (CA)
Alta Ski Area (UT)
Alyeska Resort (AK)
Anthony Lakes Mountain Resort (OR)
Arapahoe Basin (CO)
Arizona Snowbowl (AZ)
Aspen Highlands (CO)
Aspen Mountain (CO)
Aspen Skiing Company (CO)
Attitash Bear Peak (NH)
Balsams Wilderness (NH)
Bear Creek Ski & Recreation Area (PA)
Beaver Creek Resort (CO)
Berthoud Pass Ski Area (CO)
Big Bear Mountain Resort (CA)
Big Mountain Ski & Summer Resort (MT)
Black Mountain Ski Area (NH)
Blacktail Mountain Ski Area (MT)
Blue Mountain Resorts Limited (Canada)
Bogus Basin Resort (ID)
Bolton Valley Resort (VT)
Boreal Mountain Resort (CA)
Boston Mills/Brandywine Ski Resort (OH)
Breckenridge Ski Resort (CO)
Bridger Bowl Ski Area (MT)
Bristol Mountain Ski Resort (NY)
Brodie Mt. Ski Resort (MA)
Bromley Mountain Ski Resort (CVT)
Brundage Mountain Resort (ID)
Buttermilk Mountain (CO)
Camelback Ski Area (PA)
Cannon Mountain (NH)
The Canyons (UT)
Cataloochee Ski Area (NC)
Copper Mountain Resort (CO)
Cranmore Mountain Resort (NH)
Crested Butte Mountain Resort (CO)
Crystal Mountain, Inc. (WA)
Crystal Mountain Resort (MI)
Discovery Ski Area (MT)
Denton Hill Family & Ski Resort (Ski Denton) (PA)
Devil's Head Resort (WI)
Dodge Ridge Ski Area (CA)
Dyer Mountain Associates, LLC (CA)
Eagle Crest Ski Area (AK)
49 Degrees North Ski Area (WA)
Gore Mountain Ski Area (NY)
Grand Targhee Ski & Summer Resort (WY)
Greek Peak Ski Resort (NY)
Gunstock Area (NH)
Heavenly Ski Resort (CA)
Hidden Valley Ski Area (MO)
Holiday Valley Resort (NY)
HooDoo Ski Area (OR)
Hunter Mountain (NY)
Hyland Ski & Snowboard Area (MN)
Jackson Hole Mountain Resort (WY)
Jiminy Peak – The Mountain Resort (MA)
Keystone Resort (CO)
Killington Resort (VT)
Kirkwood Mountain Resort (CA)
Lookout Pass Ski & Recreation Area (ID)
Loon Mountain Recreation Corp. (NH)
Lost Trail Ski Area (MT)
Loveland Ski Area (CO)
Mammoth Mountain Ski Area (CA)
Massanutten Ski Resort (VA)
Mission Ridge (WA)
Mohawk Mountain Ski Area (CT)
Monarch Ski & Snowboard Area (CO)
Mont Ste. Marie (Canada)
Montana Snow Bowl (MT)
Mount Shasta Board & Ski Park (CA)
Mount Snow Resort (VT)
Mount Sunapee Resort (NH)
Mountain Creek (NJ)
Mountain High Resort (CA)
Mt. Ashland Ski Area (OR)
Mt. Bachelor Inc. (OR)
Mt. Hood Meadows Ski Resort (OR)
Mt. La Crosse, Inc. (WI)
Mt. Rose - Ski Tahoe (NV)

Northstar-at-Tahoe (CA)
Nub's Nob Ski Area (MI)
Okemo Mountain Resort (VT)
Otis Ridge (MA)
Panorama Resort (Canada)
Paoli Peaks (IN)
Park City Mountain Resort (UT)
Pat's Peak Ski Area (NH)
Pebble Creek Ski Area (ID)
Peek 'n Peak Resort (NY)
Pelican Butte Corporation (OR)
Pomerelle Mountain Resort (ID)
Powderhorn Resort (CO)
Powder Ridge Ski Area (CT)
Purgatory Resort (CO)
Red Lodge Mountain (MT)
Red River Ski Area (NM)
Seven Springs Mtn Resort (PA)
Shawnee Peak Ski Area (ME)
Sierra Summit Mt. Resort (CA)
Sierra-at-Tahoe Ski Resort (CA)
Silver Creek Ski Resort (CO)
Ski Bluewood (WA)
Ski Cooper (CO)
Ski Liberty (PA)
Ski Plattekill (NY)
Ski Roundtop (PA)
Ski Snowstar Winter Sports Park (IL)
Ski Windham (NY)
Sleepy Hollow Sports Park Inc. (IA)
Smuggler's Notch Resort (VT)
Snowbasin Ski Area (UT)
Snow Creek Ski Area (MO)
Snow Summit Mt. Resort (CA)
Snowbird Ski & Summer Resort (UT)
Snowmass Ski Area (CO)
Snowshoe Mountain (WV)
Soda Springs Ski Area (CA)
Solitude Mountain Resort (UT)
Spirit Mountain (MN)
Squaw Valley Ski Corp. (CA)
Steamboat Ski & Resort Corp. (CO)
Stevens Pass (WA)
Stowe Mt. Resort (VT)
Stratton Mountain (VT)
Sugar Bowl Ski Resort (CA)
Sugarbush Resort (VT)
Sugarloaf USA (ME)
The Summit at Snoqualmie (WA)
Sunburst Ski Area (WI)
Sundance (UT)
Sunday River Ski Resort (ME)
Sunlight Mountain Resort (CO)
Swain Ski & Snowboard Center (NY)
Taos Ski Valley (NM)
Telluride Ski & Golf Company (CO)
The Temple Mountain Ski Area (NH)
Tenney Mountain Ski Area (NH)
Timberline Four Seasons Resort (WV)
Timberline (OR)
Tremblant Resort Inc. (Canada)
Triple M-Mystical Mountain Magic (NM)
Vail Mountain (CO)
Vail Resorts, Inc. (CO)
Wachusett Mountain Ski Area (MA)
Welch Village Ski Area (MN)
Whistler & Blackcomb Resorts (Canada)
White Pass Ski Area (WA)
Whiteface Mt. Ski Center (NY)
Whitetail Resort (PA)
Wildcat Mountain Ski Area (CT)
Willamette Pass Ski Corp. (OR)
Williams Ski Area (AZ)
Winter Park Resort (CO)
Wintergreen Resort (VA)
Wolf Creek Ski Area (CO)

ENDORSING ASSOCIATIONS AND AFFILIATES

American Association of Snowboard Instructors
Colorado Mountain College - Ski Area Operations
Colorado Ski Country USA
National Ski Patrol
Pacific Northwest Ski Areas Association
Professional Ski Instructors of America
Ski Areas of New York
Ski Maine Association
Ski New Hampshire
Ski Utah
University of Colorado Center for Sustainable Tourism
Vermont Ski Areas Association

(Please see www.nsaa.org for updates and revisions to this list.)

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